

**CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH KỸ THUẬT HỆ THỐNG CÔNG  
NGHIỆP TRÌNH ĐỘ ĐẠI HỌC**

*(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2023  
của Hiệu trưởng trường Đại học Quốc tế)*

**1. Thông tin chung**

- Tên ngành đào tạo:
- + Tiếng Việt: Kỹ thuật Hệ thống Công nghiệp
- + Tiếng Anh: Industrial and Systems Engineering
- Mã ngành đào tạo: 7520118
- Trình độ đào tạo: Đại học
- Loại hình đào tạo: Chính Quy
- Thời gian đào tạo: 4 năm
- Tên văn bằng sau khi tốt nghiệp:
- + Tiếng Việt: Kỹ sư Kỹ thuật Hệ thống Công nghiệp
- + Tiếng Anh: Engineer in Industrial and Systems Engineering
- Nơi đào tạo: Trường Đại học Quốc Tế - ĐHQG HCM

**2. Thông tin tuyển sinh và kế hoạch đào tạo**

**a. Đối tượng tuyển sinh**

Đối tượng tuyển sinh căn cứ theo quy chế tuyển sinh đại học và cao đẳng hệ chính quy của Bộ Giáo dục & Đào tạo; dự thi đủ số môn quy định trong kỳ thi tuyển sinh đại học hàng năm do trường Đại học Quốc tế, Đại học Quốc Gia TP.HCM tổ chức theo kế hoạch chung của Bộ Giáo Dục và Đào tạo; và đạt điểm trúng tuyển do trường Đại học Quốc Tế, Đại học Quốc Gia TP HCM quy định.

Các công dân nước ngoài hoặc công dân nước Việt Nam đang theo học các chương trình quốc tế được xét tuyển theo quy định của trường Đại học Quốc Tế, Đại học Quốc Gia TP HCM.

**b. Hình thức tuyển sinh**

Trường Đại học Quốc tế thực hiện tuyển sinh theo Quy chế tuyển sinh Đại học ban hành hàng năm bởi Bộ Giáo dục và Đào tạo, căn cứ theo Đề án tuyển sinh hàng năm của Đại học Quốc gia TPHCM và Đề án tuyển sinh hàng năm của trường Đại học Quốc tế.

**a. Tổ hợp môn xét tuyển: Bao gồm ba tổ hợp môn xét tuyển:**

- + A00: Toán – Vật lý – Hóa học
- + A01: Toán – Vật lý – Tiếng Anh
- + D01: Toán – Ngữ văn – Tiếng Anh

**Dự kiến chỉ tiêu tuyển sinh, quy mô đào tạo**

Năm	2020	2021	2022	2023	2024	2025
Tuyển sinh mới	100	100	100	100	100	100
Quy mô đào tạo	400	400	400	400	400	400

**3. Mục tiêu đào tạo (Program Objectives - POs)**

Mục tiêu đào tạo của CTĐT được xác định bao gồm 4 mục tiêu, trong đó có 1 mục tiêu về kiến thức, 2 mục tiêu về kỹ năng và 1 mục tiêu về tự chủ và trách nhiệm, được trình bày như sau:

Kiến thức: PO#1

Kỹ năng: PO#3,4

Tự chủ và trách nhiệm: PO#2

Trong vòng 3-5 năm sau khi tốt nghiệp, sinh viên tốt nghiệp chương trình Kỹ thuật hệ thống công nghiệp sẽ có thể:

PO#1 Thực hành kỹ thuật trong lĩnh vực Kỹ thuật hệ thống công nghiệp

(i) Thiết kế hoặc thiết kế lại hệ thống công nghiệp

(ii) Vận hành và quản lý hệ thống công nghiệp

(iii) Cải thiện hệ thống công nghiệp hiện có

(iv) Hỗ trợ ra quyết định sáng suốt

PO#2. Học tập suốt đời để duy trì và nâng cao kỹ năng nghề nghiệp

PO#3. Làm việc hiệu quả với mọi người và thể hiện khả năng lãnh đạo, kỹ năng chuyên môn và hành vi đạo đức tại nơi làm việc

PO#4. Đáp ứng nhu cầu của cộng đồng và ngành hệ thống công nghiệp Việt Nam trong việc giải quyết các vấn đề về hạ logistics sử dụng kỹ thuật công nghiệp và hệ thống nguyên tắc, công cụ và kỹ thuật.

Các mục tiêu chương trình của chương trình Kỹ thuật hệ thống công nghiệp được xác định bởi giảng viên chương trình với sự tư vấn và phân tích về tầm nhìn và sứ mệnh của trường đại học và nhu cầu của các bên liên quan. PO#1 đề cập đến các khả năng chính của kỹ sư Kỹ thuật Hệ thống công nghiệp, yêu cầu sinh viên tốt nghiệp như một kỹ sư không chỉ có khả năng vận hành và quản lý một hệ thống hiện có mà còn có thể thiết kế một hệ thống mới hoặc cải tiến nó. PO#2, học tập suốt đời và PO#3, kỹ năng con người, là yêu cầu của tất cả các bên liên quan.

Do đó, PO#1 và #2 đáp ứng sứ mệnh đầu tiên của IU là cung cấp sinh viên tốt nghiệp chất lượng cao và giáo dục đại học đa ngành nói chung và trong lĩnh vực hậu cần và cung ứng quản lý chuỗi nói riêng. PO#1 và PO#4 cũng ngụ ý khả năng thực hiện nghiên cứu và phụng sự cộng đồng, xã hội là sứ mệnh thứ hai của trường đại học. PO#4 đóng góp thúc đẩy hệ thống công nghiệp trong nhiều lĩnh vực các ngành sản xuất và dịch vụ ở Việt Nam phù hợp với nhiệm vụ thứ ba của trường đại học [Trang web IU].

Các mục tiêu của chương trình Kỹ thuật hệ thống công nghiệp nhất quán với tầm nhìn và sứ mệnh của tổ chức như trong Bảng 1.

**Bảng 1. Sự phù hợp của mục tiêu đào tạo với Tầm nhìn, sứ mệnh của trường ĐHQG Quốc Tế.**

Tầm nhìn trường ĐHQG	Sứ mệnh trường ĐHQG	Mục tiêu đào tạo - Program Objectives			
		PO#1	PO#2	PO#3	PO#4
Ươm mầm tài năng và cung cấp lao động chất lượng cao cho lực lượng lao động trong nước và quốc tế	<ul style="list-style-type: none"> <li>- Tăng cường quốc tế hóa bằng cách sử dụng tiếng Anh làm phương tiện giảng dạy. Sinh viên được đào tạo để trở thành những công dân toàn cầu có ý thức tự giác cao về trách nhiệm xã hội vì một sự phát triển lâu dài, bền vững.</li> <li>- Theo đuổi sự xuất sắc trong nghiên cứu cơ bản và ứng dụng nhằm đáp ứng nhu cầu đổi mới và phát triển bền vững của ngành, tỉnh và khu vực; để thúc đẩy kết nối thông qua các hoạt động hợp tác và các dịch vụ xã hội</li> </ul>	X	X	X	
Trở thành một trong những trường dẫn đầu các trường đại học nghiên cứu ở châu Á	Cung cấp các chương trình giáo dục đại học trong nhiều lĩnh vực, tất cả đều được công nhận bởi các tổ chức kiểm định khu vực và quốc tế	X			X
	<ul style="list-style-type: none"> <li>- Trở thành cơ sở giáo dục đại học quốc tế, mang bản sắc văn hóa Việt Nam</li> <li>- Tiên phong áp dụng mô hình quản trị giáo dục đại học tiên tiến, tự chủ</li> </ul>		X	X	

**4. Chuẩn đầu ra của chương trình đào tạo (Program Learning Outcomes – PLOs)**



PO#1 Thực hành kỹ thuật trong lĩnh vực Kỹ thuật hệ thống công nghiệp (i) Thiết kế hoặc thiết kế lại hệ thống công nghiệp (ii) Vận hành và quản lý hệ thống công nghiệp (iii) Cải thiện hệ thống công nghiệp hiện có (iv) Hỗ trợ ra quyết định sáng suốt	X	X		X		X	
PO#2 Tự chủ và trách nhiệm							X
PO#3;4: Kỹ năng			X		X		
		X		X			

<sup>(1)</sup>Cột PLOs: Thầy/Cô xác định các CDR tương ứng với các khối kiến thức, kỹ năng, tự chủ và trách nhiệm.

<sup>(2)</sup>Cột POs: Thầy/Cô cung cấp các mục tiêu đào tạo cụ thể mà đã được trình bày ở Mục 3 Trong Bảng 2, cần xác định mối liên quan bằng cách đặt dấu “X”

## 6. Quy trình đào tạo, điều kiện tốt nghiệp

Căn cứ Quyết định số 1342/QĐ-ĐHQG ngày 30 tháng 9 năm 2022 của Giám đốc Đại học Quốc gia Thành phố Hồ Chí Minh về việc ban hành Quy chế đào tạo trình độ đại học.

Căn cứ Quyết định số 719/QĐ-ĐHQT ngày 06 tháng 12 năm 2021 của Hiệu trưởng trường Đại học Quốc tế về việc ban hành Quy chế đào tạo trình độ đại học theo hệ thống tín chỉ tại trường Đại học Quốc tế.

## 7. Thang điểm (theo thang điểm chính thức của trường)

Trường quy định thang điểm đánh giá kết quả học tập của người học (Quy chế đào tạo trình độ đại học theo hệ thống tín chỉ tại trường Đại học Quốc tế)

**Bảng 3: Thang điểm**

Xếp loại	Thang điểm 100	Thang điểm 10	Thang điểm 4	Thang điểm chữ
<b>Đạt</b>				
Xuất sắc	$90 \leq \text{ĐTBTL} \leq 100$	$9,0 \leq \text{ĐTBTL} \leq 10$	4,0	A+
Giỏi	$80 \leq \text{ĐTBTL} < 90$	$8,0 \leq \text{ĐTBTL} < 9,0$	3,5	A
Khá	$70 \leq \text{ĐTBTL} < 80$	$7,0 \leq \text{ĐTBTL} < 8,0$	3,0	B+
Trung bình khá	$60 \leq \text{ĐTBTL} < 70$	$6,0 \leq \text{ĐTBTL} < 7,0$	2,5	B
Trung bình	$50 \leq \text{ĐTBTL} < 60$	$5,0 \leq \text{ĐTBTL} < 6,0$	2,0	C
<b>Không đạt</b>				
Yếu	$40 \leq \text{ĐTBTL} < 50$	$4,0 \leq \text{ĐTBTL} < 5,0$	1,5	D+

Kém	$30 \leq \text{ĐTBTL} < 40$	$3,0 \leq \text{ĐTBTL} < 4,0$	1,0	D
	$\text{ĐTBTL} < 30$	$\text{ĐTBTL} < 3,0$	0,0	F

### 8. Khối lượng kiến thức toàn khoá

Tổng số tín chỉ: 150 tín chỉ, trong đó phân bổ kiến thức như Bảng 4 (không bao gồm giáo dục thể chất và giáo dục quốc phòng):

**Bảng 4. Cấu trúc chương trình đào tạo**

TT	Các khối kiến thức <sup>(3)</sup>	Khối lượng	
		Số tín chỉ	%
I	Khối kiến thức giáo dục đại cương	46	30.7
II	Khối kiến thức cơ sở ngành	20	13.3
III	Kiến thức chuyên ngành	69	38.0
IV	Kiến thức bổ trợ	0	8.0
V	Thực tập, khóa luận/luận văn tốt nghiệp	15	10.0
	<b>Tổng cộng</b>	<b>150</b>	<b>100</b>

Thầy/Cô có thể trình bày các nội dung Bảng 4 theo các khối kiến thức mà CTĐT của Thầy/Cô đang phân chia, tuy nhiên bảo đảm tổng các khối kiến thức trong CTĐT của Thầy/Cô phải tương ứng với các khối kiến thức như Bảng 4

### 9. Nội dung chương trình đào tạo

**Bảng 5: Các môn học thuộc CTĐT ngành Kỹ thuật Hệ thống công nghiệp khóa 2023**

STT	Mã MH	Tên môn học (MH)		Loại MH (Bắt buộc/ Tự chọn)	Tín chỉ			Phòng TN (**)
		Tiếng Việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/ Thí nghiệm	
<b>I</b>	<b>Kiến thức giáo dục đại cương</b>				<b>46</b>	<b>45</b>	<b>1</b>	
1	PE015IU	Triết học Mác-Lênin	Philosophy of marxism and Leninism	Bắt buộc	3	3		
2	PE016IU	Kinh tế chính trị Mác-Lênin	Political economics of marxism and leninism	Bắt buộc	2	2		

3	PE017IU	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2		
4	PE018IU	Lịch sử Đảng Cộng Sản Việt Nam	History of the Communist Party of Vietnam	Bắt buộc	2	2		
5	PE019IU	Tư tưởng Hồ Chí Minh	HCM' s thoughts	Bắt buộc	2	2		
6	EN007IU EN008IU	Tiếng Anh chuyên ngành 1	Writing AE1 Listening AE1	Bắt buộc	4	4		
7	EN011IU EN012IU	Tiếng Anh chuyên ngành 2	Writing AE2 Speaking AE2	Bắt buộc	4	4		
8	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3		
9	MA001IU	Giải tích 1	Calculus 1	Bắt buộc	4	4		
10	MA003IU	Giải tích 2	Calculus 2	Bắt buộc	4	4		
11	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2		
12	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2		
13	PH015IU	Vật lý 3	Physics 3	Bắt buộc	3	3		
14	CH012IU	Thí nghiệm hóa học	Chemistry Laboratory	Bắt buộc	1	0	1	
15	CH011IU	Hóa cơ bản	Chemistry for Engineers	Bắt buộc	3	3		
16	MA023IU	Giải tích 3	Calculus 3	Bắt buộc	4	4		
17	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	3		

18	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3	3		
19	MA027IU	Đại số tuyến tính ứng dụng	Applied Linear Algebra	Bắt buộc	2	2		
20	PE021IU	Pháp luật đại cương	General law	Bắt buộc	3	3		
<b>II</b>	<b>Kiến thức cơ sở ngành</b>				20	18	2	
21	IS004IU	Xác suất thống kê cho kỹ thuật	Engineering Probability & Statistics	Bắt buộc	4	4		
22	IS020IU	Kinh tế kỹ thuật	Engineering Economy	Bắt buộc	3	3		
23	IS019IU	Quản lý sản xuất	Production Management	Bắt buộc	3	3		
24	IS001IU	Giới thiệu ngành Kỹ thuật Hệ thống Công nghiệp	Introduction to Industrial Engineering	Bắt buộc	1	0	1	Mô phỏng hệ thống công nghiệp Giao tiếp người và máy
25	IS085IU	CAD/CAM/ CNC	CAD/CAM/CNC	Bắt buộc	3	2	1	
26	IS102IU	Vẽ kỹ thuật	Engineering Drawing	Bắt buộc	3	3		
27	IS086IU	Tin học cho kỹ sư	Intro to Computing	Bắt buộc	3	3		
<b>III</b>	<b>Kiến thức chuyên ngành</b>							
<b>III.1</b>	<b>Kiến thức chuyên ngành bắt buộc</b>				56	54	2	



28	IS103IU	Vận trù học 1 - Các mô hình tất định	Deterministic models in OR	Bắt buộc	3	3		
29	IS017IU	Đo lường lao động và Thiết kế công việc	Work design & Ergonomics + Lab	Bắt buộc	4	3	1	
30	IS034IU	Thiết kế và phát triển sản phẩm	Product Design & Development	Bắt buộc	3	3	0	
31	IS028IU	Mô hình hóa và mô phỏng	Simulation Models in Industrial Engineering	Bắt buộc	4	3	1	Mô phỏng hệ thống công nghiệp
32	IS027IU	Kỹ thuật điều độ trong sản xuất và dịch vụ	Scheduling & Sequencing	Bắt buộc	3	3		
33	IS023IU	Quản lý vật tư tồn kho	Inventory Management	Bắt buộc	3	3		
34	IS091IU	Hệ thống thông tin quản lý với ứng dụng ERP	Management Information Systems with ERP Applications	Bắt buộc	3	3		
35	IS079IU	Tiếng Anh học thuật	Scientific Writing	Bắt buộc	2	2		
36	IS111IU	Đồ án 1	Capstone 1	Bắt buộc	3	3		
37	IS041IU	Hệ thống Sản xuất tinh gọn	Lean Production	Bắt buộc	3	3		
38	IS025IU	Quản lý chất lượng	Quality Management	Bắt buộc	3	3		
39	IS026IU	Quản lý dự án	Project Management	Bắt buộc	3	3		
40	IS104IU	Kỹ thuật dự báo	Time series & Forecasting technique	Bắt buộc	2	2		

41	IS092IU	Phân tích, thu thập số liệu và ứng dụng	Data Collection, Analysis and Applications	Bắt buộc	3	3		
<b>Đối với hướng chuyên ngành general (chung)</b>								
42	IS024IU	Các mô hình bất định trong nghiên cứu vận hành	Probabilistic Models in OR	Bắt buộc	3	3		
43	IS031IU	Thiết kế thực nghiệm	Experimental Design	Bắt buộc	3	3		
44	IS033IU	Kỹ thuật ra quyết định đa mục tiêu	Multi-Criteria Decision Making	Bắt buộc	3	3		
45	IS032IU	Thiết kế mặt bằng hệ thống công nghiệp	Facility Layout	Bắt buộc	3	3		
<b>Đối với hướng Intelligent Industrial Systems</b>								
46	IS096IU	Phân tích nâng cao dữ liệu trong thương mại và công nghiệp	Advanced Industrial Big Data Analytics	Bắt buộc	3	3		
47	IS095IU	Hệ thống công nghiệp thông minh	Industrial Intelligent Systems	Bắt buộc	3	3		
48	IS097IU	Các hệ thống sản xuất thông minh	Smart Manufacturing Systems	Bắt buộc	3	3		
49	IS098IU	Mô hình hóa và tạo mẫu nâng cao	Advanced Modeling & Prototyping	Bắt buộc	3	3		
<b>Đối với hướng chuyên ngành Industrial Analytics</b>								
50	IS099IU	Hệ thống dữ liệu trong thương mại và công nghiệp	Industrial & Commercial Data Systems	Bắt buộc	3	3		
51	IS093IU	Phân tích dữ liệu dự đoán và ứng dụng	Predictive Data Analytics and Applications	Bắt buộc	3	3		

52	IS100IU	Phân tích quyết định	Decision Analytics	Bắt buộc	3	3		
53	IS101IU	Phân tích, mô hình hóa dữ liệu hệ thống và quy trình công nghiệp	Industrial Process, System Data Analysis and Modelling	Bắt buộc	3	3		
<b>III.2</b>	<b>Kiến thức chuyên ngành tự chọn 1 (chọn 1 trong các môn sau đây)</b>				<b>6</b>	<b>6</b>		
54	IS087IU	Các quá trình sản xuất	Manufacturing Processes	Tự chọn	3	3		
55	IS106IU	Hệ thống thương mại điện tử	E-Commerce Systems	Tự chọn	3	3		
56	IS105IU	Hệ thống chuỗi cung ứng lạnh	Cold Chain Systems	Tự chọn	3	3		
<b>III.3</b>	<b>Kiến thức chuyên ngành tự chọn 2 (chọn 2 trong các môn sau đây)</b>				<b>6</b>	<b>6</b>		
57	IS080IU	Tư duy sáng tạo	Creative Thinking	Tự chọn	3	3		
58	IS035IU	Kỹ thuật Hệ thống	Systems Engineering	Tự chọn	3	3		
60	IS043IU	Vận chuyển quốc tế	International transportation & Logistics	Tự chọn	3	3		
61	IS045IU	Thương mại điện tử trong logistics và Chuỗi cung ứng	E- Logistics in supply Management	Tự chọn	3	3		
62	IS082IU	Hệ thống sản xuất linh hoạt	Flexible Manufacturing Systems	Tự chọn	3	3		
63	IS067IU	Kỹ năng lãnh đạo	Leadership	Tự chọn	3	3		
64	IS062IU	Quản lý bán lẻ	Retail Management	Tự chọn	3	3		

65	IS066IU	Khai phá dữ liệu trong chuỗi cung ứng	Data Mining In Supply Chain	Tự chọn	3	3		
<b>III. 4</b>	<b>Kiến thức chuyên ngành tự chọn tự do (chọn 1 trong các môn tự chọn ngoài ngành theo bảng các môn học tự chọn bên dưới)</b>			Tự chọn	3	3		
<b>IV</b>	<b>Thực tập, khóa luận/ luận văn tốt nghiệp</b>							
65	IS052IU	Thực tập 1	Internship 1	Bắt buộc	2			
66	IS053IU	Thực tập 2	Internship 2	Bắt buộc	3			
<b>Đối với sinh viên có GPA &gt; 70</b>								
67	IS048IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10		
<b>Đối với sinh viên có GPA ≤ 70: Sinh viên học 2 môn học theo học phần (cả 3 chuyên ngành)</b>								
68	IS094IU	Hệ thống sản xuất và chuỗi cung ứng nâng cao	Advanced Industrial and Supply Chain Systems	Bắt buộc	4	4		
69	IS108IU	Đồ án 2	Capstone 2	Bắt buộc	6	6		
<b>Tổng số tín chỉ:</b>					150			

**Ghi chú: Bảng các môn kiến thức chuyên ngành tự chọn 3**

No.	Courses code	Courses	Credits
1	PE014IU	Environmental Science	3
2	PE020IU	Ethics and professional skills for engineers	3
3	BA115IU	Introduction to Business Administration	3
4	BA117IU	Introduction to Micro Economics	3
5	BA120IU	Business Computing Skills	3
6	BA123IU	Principles of Management	3

7	BA119IU	Introduction to Macro Economics	3
8	BA118IU	Introduction to Psychology	3
9	BA197IU	Introduction to Sociology	3
10	IT011UN	Functional Programming	3
11	IT120IU	Entrepreneurship	3
12	IT007UN	Skills for Communicating Information	3
13	IT151IU	Statistical Methods	3
14	BM033IU	Information Technology in the Health Care System	3
15	ENEE2001IU	Introduction to Environmental Engineering	3
16	ENEE2008IU	Environmental Ecology	3
17	CHE2041IU	Mass Transfer Operations	3
18	MAFE105IU	Financial Economics	3
19	MAFE215IU	Financial Management	3
20	MAFE209IU	Financial markets	3
21	MAFE207IU	Decision Making	3
22	MAFE308IU	Financial Risk Management 1	3
23	MAFE402IU	Portfolio Management	3
24	PH027IU	Earth Observation and The Environment	3
25	PH047IU	Navigation Systems	3
26	PH046IU	Geographic Information Systems (GIS) and Spatical Analysis	3
27	CE505IU	Geotechnics	3
28	EE049IU	Introduction to Electrical Engineering	3

#### 10. Dự kiến kế hoạch giảng dạy (phân bố các môn học theo từng học kỳ)

Tùy vào trình độ tiếng Anh của người học đạt trình độ AE1, IE2, IE1 và IE0, kế hoạch giảng dạy các môn học đại cương và cơ sở ngành trong 2 năm – 2.5 năm được trình bày ở các Bảng 6, Bảng 7, Bảng 8 và Bảng 9. Sau 4 – 5 học kỳ, sinh viên sẽ được phân chuyên ngành theo 3 hướng chuyên ngành khác nhau.

##### 10.1. Trình độ AE1

**Bảng 6: Kế hoạch giảng dạy đối với người học đạt trình độ AE1 (3 chuyên ngành)**

Học kỳ	Mã MH	Tên MH	Loại MH	Tín chỉ	Môn học
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		Tiếng việt	Tiếng Anh	(bắt buộc/tự chọn)	Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	tiên quyết/ Môn học trước/ Môn học song hành
<b>I (19 tín chỉ)</b>	EN007IU	Tiếng Anh chuyên ngành 1	Writing AE1	Bắt buộc	2	2	0	
	EN008IU		Listening AE1		2	2	0	
	MA001IU	Giải tích 1	Calculus 1	Bắt buộc	4	4	0	
	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	CH011IU	Hóa cơ bản	Chemistry for Engineers	Bắt buộc	3	3	0	
	CH012IU	Thí nghiệm Hóa	Chemistry Laboratory	Bắt buộc	1	0	1	
	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3			
<b>II (20 tín chỉ)</b>	EN011IU	Tiếng Anh chuyên ngành 2	Writing AE2	Bắt buộc	2	2	0	
	EN012IU		Speaking AE2		2	2	0	
	MA003IU	Giải tích 2	Calculus 2	Bắt buộc	4	4	0	
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	PH015IU	Vật lý 3	Physics 3	Bắt buộc	3	2	1	
	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3			

	IS001IU	Giới thiệu ngành Kỹ thuật hệ thống công nghiệp	Introduction to Industrial Engineering	Bắt buộc	1	0	1	
	IS102IU	Vẽ kỹ thuật	Engineering Drawing	Bắt buộc	3	3	0	
<b>Hệ (5 tín chỉ)</b>	PE015IU	Triết học Mác Lênin	Philosophy of marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác- Lênin	Political economics of marxism and leninism	Bắt buộc	2	2	0	
<b>III (21 tín chỉ)</b>	IS004IU	Xác suất thống kê cho kỹ thuật	Engineering probability and statistics	Bắt buộc	4	4	0	
	IS086IU	Tin học cho kỹ sư	Introduction to Computing	Bắt buộc	3	3	0	
	PE021IU	Pháp luật đại cương	General Law	Bắt buộc	3	3	0	
	MA027IU	Đại số tuyến tính ứng dụng	Applied Linear Algebra	Bắt buộc	2	2	0	
	IS019IU	Quản lý sản xuất	Production Management	Bắt buộc	3	3	0	
	MA023IU	Giải tích 3	Calculus 3	Bắt buộc	4	4	0	
	PE017IU	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	
	IS020IU	Kinh tế kỹ thuật	Engineering Economy	Bắt buộc	3	3	0	
	IS103IU	Vận trù học 1 – Các mô hình tất định	Deterministic Models in	Bắt buộc	3	3	0	

<b>IV (20 tín chỉ)</b>			Operation Research					
	IS017IU	Đo lường lao động và Thiết kế công việc	Work design & Ergonomics	Bắt buộc	4	3	1	
	IS026IU	Quản lý dự án	Project Management	Bắt buộc	3	3	0	
	IS034IU	Thiết kế và phát triển sản phẩm	Product Design & Development	Bắt buộc	3	3	0	
	PE018IU	Lịch sử Đảng cộng sản Việt Nam	History of the Communist Party of Vietnam	Bắt buộc	2	2	0	
	PE019IU	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thought s	Bắt buộc	2	2	0	
<b>Hè (2 tín chỉ)</b>	IS069IU	Thực tập 1	Internship 1	Bắt buộc	2	2	0	
		Quân sự	Military Training	Bắt buộc				

## 10.2. Trình độ IE2 (3 chuyên ngành)

**Bảng 7: Kế hoạch giảng dạy đối với người học đạt trình độ IE2**

Học kỳ	Mã MH	Tên MH	Loại MH (bắt buộc/tự chọn)	Tín chỉ	Môn học tiên quyết (TQ)/ Môn học học trước (HT)/



								Môn học song hành (SH)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuy ết	Thự c hà n h/ Thí nghi ệm	
<b>I</b> (20 tín chỉ)	ENTP02	Tiếng Anh chuyên sâu 2	Intensive English 2- Twinning Program	Bắt buộc	13	13	0	
	MA001IU	Giải tích 1	Calculus 1	Bắt buộc	4	4	0	
	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3			
<b>II</b> (21 tín chỉ)	EN007IU	Tiếng Anh chuyên ngành 1	Writing AE1	Bắt buộc	2	2	0	
	EN008IU		Listening AE1		2	2	0	
	CH011IU	Hóa cơ bản	Chemistry for Engineers	Bắt buộc	3	3	0	
	CH012IU	Thí nghiệm hóa học	Chemistry Laboratory	Bắt buộc	1	0	1	
	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	MA003IU	Giải tích 2	Calculus 2	Bắt buộc	4	4	0	

	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	IS001IU	Giới thiệu ngành Kỹ thuật hệ thống Công nghiệp	Introduction to Industrial Engineering	Bắt buộc	1	0	1	
	MA027IU	Đại số tuyến tính ứng dụng	Applied Linear Algebra	Bắt buộc	2	2	0	
	IS102IU	Vẽ kỹ thuật	Engineering Drawing	Bắt buộc	2	2	0	
<b>Hè (8 tín chỉ)</b>	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3			
	PE015IU	Triết học Mác Lênin	Philosophy of marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác- Lênin	Political economics of marxism and leninism	Bắt buộc	2	2	0	
<b>III (21 tín chỉ)</b>	IS004IU	Xác suất thống kê cho kỹ thuật	Engineering probability and statistics	Bắt buộc	4	4	0	
	IS086IU	Tin học cho kỹ sư	Introduction to Computing	Bắt buộc	3	3	0	
	EN011IU	Tiếng Anh chuyên ngành 2	Writing AE2	Bắt buộc	2	2	0	
	EN012IU		Speaking AE2		2	2	0	

	IS019IU	Quản lý sản xuất	Production Management	Bắt buộc	3	3	0	
	PH015IU	Vật lý 3	Physics 3	Bắt buộc	3	2	1	
	MA023IU	Giải tích 3	Calculus 3	Bắt buộc	4	4	0	
<b>IV (24 tín chỉ)</b>	IS020IU	Kinh tế kỹ thuật	Engineering Economy	Bắt buộc	3	3	0	
	IS103IU	Vận trù học 1 – Các mô hình tất định	Deterministic Models in Operation Research	Bắt buộc	3	3	0	
	IS017IU	Đo lường lao động và Thiết kế công việc	Work design & Ergonomics	Bắt buộc	3	3	0	
	IS0344IU	Thiết kế và phát triển sản phẩm	Product Design & Development	Bắt buộc	3	3	0	
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	PE017IU	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	
	IS026IU	Quản lý dự án	Project Management	Bắt buộc	3	3	0	
	PE021IU	Pháp luật đại cương	General Law	Bắt buộc	3	3	0	
	<b>Hệ (2 tín chỉ)</b>	IS069IU	Thực tập 1	Internship 1	Bắt buộc	2	2	0
		Quân sự	Military Training	Bắt buộc				

## 10.3 Trình độ IE1 (3 chuyên ngành)

Bảng 8: Kế hoạch giảng dạy đối với người học đạt trình độ IE1

Học kỳ	Mã MH	Tên MH		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Môn học tiên quyết (TQ)/ Môn học học trước (HT)/ Môn học song hành (SH)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/ Thí nghiệm	
<b>I</b> (30 tín chỉ)	ENTP01	Tiếng Anh chuyên sâu 1	Intensive English 1- Twinning Program	Bắt buộc	17	17	0	
	ENTP02	Tiếng Anh chuyên sâu 2	Intensive English 2- Twinning Program	Bắt buộc	13	13	0	
<b>II</b> (19 tín chỉ)	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	CH011IU	Hóa cơ bản	Chemistry for Engineers	Bắt buộc	3	3	0	
	CH012IU	Thí nghiệm Hóa	Chemistry Laboratory	Bắt buộc	1	0	1	
	MA001IU	Giải tích 1	Calculus 1	Bắt buộc	4	4	0	

	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	0	0	
	EN007IU	Tiếng Anh chuyên ngành 1	Writing AE1	Bắt buộc	2	2	0	
	EN008IU		Listening AE1		2	2	0	
<b>Hệ (8 tín chỉ)</b>	PE015IU	Triết học Mác Lênin	Philosophy of marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác- Lênin	Political economics of marxism and leninism	Bắt buộc	2	2	0	
	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3			
<b>III (20 tín chỉ)</b>	IS001IU	Giới thiệu ngành Kỹ thuật hệ thống Công nghiệp	Introduction to Industrial Engineering	Bắt buộc	1	0	1	
	IS004IU	Xác suất thống kê cho kỹ thuật	Engineering probability and statistics	Bắt buộc	4	4	0	
	IS086IU	Tin học cho kỹ sư	Introduction to Computing	Bắt buộc	3	3	0	
	MA027IU	Đại số tuyến tính ứng dụng	Applied Linear Algebra	Bắt buộc	2	2	0	
	IS019IU	Quản lý sản xuất	Production Management	Bắt buộc	3	3	0	
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	MA003IU	Giải tích 2	Calculus 2	Bắt buộc	4	4	0	

<b>IV (15 tín chỉ)</b>	EN011IU	Tiếng Anh chuyên ngành 2	Writing AE2	Bắt buộc	2	2	0	
	EN012IU		Speaking AE2	Bắt buộc	2	2	0	
	IS103IU	Vận trù học 1 – Các mô hình tất định	Deterministic Models in Operation Research	Bắt buộc	3	3	0	
	IS102IU	Vẽ kỹ thuật	Engineering Drawing	Bắt buộc	3	3	0	
	PE017IU	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	
	IS026IU	Quản lý dự án	Project Management	Bắt buộc	3	3	0	
<b>Hè (2 tín chỉ)</b>	IS069IU	Thực tập 1	Internship 1	Bắt buộc	2	2	0	
		Quân sự	Military Training	Bắt buộc				
<b>V (14 tín chỉ)</b>	<b>PE021IU</b>	<b>Pháp luật đại cương</b>	<b>General law</b>	<b>Bắt buộc</b>	<b>3</b>	<b>3</b>	<b>0</b>	
	PE018IU	Lịch sử Đảng Cộng sản Việt Nam	History of the Communist Party of Vietnam	Bắt buộc	2	2	0	
	PE019IU	Tư tưởng Hồ Chí Minh	HCM' s thoughts	Bắt buộc	2	2	0	
	PH015IU	Vật lý 3	Physics 3	Bắt buộc	3	2	1	
	MA023IU	Giải tích 3	Calculus 3	Bắt buộc	4	4	0	

#### 10.4. Trình độ IE0 (3 chuyên ngành)

**Bảng 9: Kế hoạch giảng dạy đối với người học đạt trình độ IE0 (3 chuyên ngành)**

Học kỳ	Mã MH	Tên MH		Loại MH (bắt buộc/ tự chọn)	Tín chỉ			Môn học tiên quyết (TQ)/ Môn học học trước (HT)/ Môn học song hành (SH)
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	
<b>I</b> <b>(34</b> <b>tín chỉ)</b>	ENTP00	Tiếng Anh chuyên sâu 0	Intensive English 0-Twinning Program	Bắt buộc	17	17	0	
	ENTP01	Tiếng Anh chuyên sâu 1	Intensive English 1-Twinning Program	Bắt buộc	17	17	0	
<b>II</b> <b>(20</b> <b>tín chỉ)</b>	ENTP02	Tiếng Anh chuyên sâu 2	Intensive English 2-Twinning Program	Bắt buộc	13	13	0	
	MA001IU	Giải tích 1	Calculus 1	Bắt buộc	4	4	0	
	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3			
<b>Hè</b> <b>(12</b> <b>tín chỉ)</b>	EN007IU	Tiếng Anh chuyên ngành 1	Writing AE1	Bắt buộc	2	2	0	
	EN008IU		Listening AE1		2	2	0	
	PE015IU	Triết học Mác Lênin	Philosophy of marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác- Lênin	Political economics of marxism and leninism	Bắt buộc	2	2	0	

	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3			
<b>III (19 tín chỉ)</b>	IS001IU	Giới thiệu ngành Kỹ thuật Hệ thống công nghiệp	Introduction to Industrial Engineering	Bắt buộc	1	0	1	
	IS004IU	Xác suất thống kê cho kỹ thuật	Engineering probability and statistics	Bắt buộc	4	4	0	
	IS086IU	Tin học cho kỹ sư	Introduction to Computing	Bắt buộc	3	3	0	
	MA027IU	Đại số tuyến tính ứng dụng	Applied Linear Algebra	Bắt buộc	2	2	0	
	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	PE017IU	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	
<b>IV (23 tín chỉ)</b>	EN011IU	Tiếng Anh chuyên ngành 2	Writing AE2	Bắt buộc	2	2	0	
	EN012IU		Speaking AE2		2	2	0	
	MA003IU	Giải tích 2	Calculus 2	Bắt buộc	4	4	0	



	IS026IU	Đo lường lao động và Thiết kế công việc	Work design & Ergonomics	Bắt buộc	4	4	0	
	IS034IU	Thiết kế và phát triển sản phẩm	Product Design & Development	Bắt buộc	3	3	0	
	IS020IU	Kinh tế kỹ thuật	Engineering Economy	Bắt buộc	3	3	0	
	IS103IU	Vận trù học 1 – Các mô hình tất định	Deterministic Models in Operation Research	Bắt buộc	3	3	0	
	IS102IU	Vẽ kỹ thuật	Engineering Drawing	Bắt buộc	2	2	0	
<b>Hè (2 tín chỉ)</b>	IS069IU	Thực tập 1	Internship 1	Bắt buộc	2	2	0	
		Quân sự	Military Training	Bắt buộc				
<b>V (21 tín chỉ)</b>	MA023IU	Giải tích 3	Calculus 3	Bắt buộc	4	4	0	
	IS019IU	Quản lý sản xuất	Production Management	Bắt buộc	3	3	0	
	PE021IU	Pháp luật đại cương	General Law	Bắt buộc	3	3	0	
	PE018IU	Lịch sử Đảng cộng	History of the Communist	Bắt buộc	2	2	0	

		sản Việt Nam	Party of Vietnam					
	PE019IU	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	
	PH015IU	Vật lý 3	Physics 3	Bắt buộc	3	2	1	
	CH011IU	Hóa cơ bản	Chemistry for Engineers	Bắt buộc	3	3	0	
	CH012IU	Thí nghiệm Hóa	Chemistry Laboratory	Bắt buộc	1	0	1	

Sau khi học xong chương trình đào tạo từ 2-2.5 năm (4-5 học kỳ), sinh viên sẽ được phân theo 3 hướng chuyên ngành khác nhau.

#### **Hướng chuyên ngành chung (General)**

<b>V (20 tín chỉ)</b>	IS091IU	Hệ thống thông tin quản lý với ứng dụng ERP	Management Information Systems with ERP Applications	Bắt buộc	3	3	0	
	IS023IU	Quản lý vật tư tồn kho	Inventory Management	Bắt buộc	3	3	0	
	IS025IU	Quản lý chất lượng	Quality Management	Bắt buộc	3	3	0	
	IS085IU	CAD/CAM/CNC	CAD/CAM/CNC	Bắt buộc	3	3	0	
	IS092IU	Phân tích, thu thập số liệu và ứng dụng	Data Collection, Analysis and Applications	Bắt buộc	3	3	0	

	IS104IU	Kỹ thuật dự báo	Time series & Forecasting Technique	Bắt buộc	2	2	0	
	<b>Môn tự chọn bắt buộc số 1 (chọn 1 môn)</b>				<b>3</b>	<b>3</b>		
	IS105IU	Hệ thống chuỗi cung ứng lạnh	Cold Chain Systems	Bắt buộc	3	3	0	
	IS087IU	Quá trình sản xuất	Manufacturing Processes	Tự chọn	3	3	0	
	IS106IU	Hệ thống thương mại điện tử	E-Commerce Systems	Tự chọn	3	3	0	
<b>VI (20 tín chỉ)</b>	IS079IU	Tiếng anh học thuật	Scientific Writing	Bắt buộc	3	3	0	
	IS027IU	Kỹ thuật điều độ trong sản xuất và dịch vụ	Scheduling & Sequencing	Bắt buộc	3	3	0	
	IS028IU	Mô hình hóa và mô phỏng	Simulation Models in IE	Bắt buộc	4	4	0	
	IS041IU	Sản xuất tinh gọn	Lean Production	Bắt buộc	3	3	0	
	IS031IU	Thiết kế thực nghiệm	Experimental Design	Bắt buộc	3	3	0	
	IS024IU	Các mô hình bất định trong nghiên cứu vận hành	Probabilistic Models in OR	Bắt buộc	3	3	0	

<b>Hè (3 tín chỉ)</b>	IS070IU	Thực tập 2	Internship 2	Bắt buộc	3	3	0	
<b>VII (18 tín chỉ)</b>	IS111IU	Đồ án 1	Capstone 1	Bắt buộc	3	3	0	
	IS033IU	Kỹ thuật ra quyết định đa mục tiêu	Multi-criteria Decision Making	Bắt buộc	3	3	0	
	IS032IU	Thiết kế mặt bằng	Facility Layout	Bắt buộc	3	3	0	
	<b>Môn tự chọn bắt buộc 2 (chọn 2 môn)</b>				<b>3</b>	<b>3</b>		
	IS080IU	Tư duy sáng tạo	Creative Thinking	Tự chọn	3	3		
	IS035IU	Kỹ thuật Hệ thống	Systems Engineering	Tự chọn	3	3		
	IS067IU	Vận chuyển quốc tế	International transportation & Logistics	Tự chọn	3	3		
	IS062IU	Thương mại điện tử trong logistics và Chuỗi cung ứng	E- Logistics in supply Management	Tự chọn	3	3		
	IS043IU	Hệ thống sản xuất linh hoạt	Flexible Manufacturing Systems	Tự chọn	3	3		
	IS045IU	Kỹ năng lãnh đạo	Leadership	Tự chọn	3	3		
	IS082IU	Quản lý bán lẻ	Retail Management	Tự chọn	3	3		

IS066IU	Khai phá dữ liệu trong chuỗi cung ứng	Data Mining In Supply Chain	Tự chọn	3	3		
<b>Môn tự chọn tự do (chọn 1 môn)</b>				<b>3</b>	<b>3</b>	<b>0</b>	
PE014IU	Khoa học môi trường	Environmental Science	Tự chọn	3	3	0	
PE020IU	Đạo đức và kỹ năng nghề nghiệp của kỹ sư	Ethics and professional skills for engineers	Tự chọn	3	3	0	
BA115IU	Giới thiệu ngành Quản trị kinh doanh	Introduction to Business Administration	Tự chọn	3	3	0	
BA117IU	Giới thiệu ngành Kinh tế vi mô	Introduction to Micro Economics	Tự chọn	3	3	0	
BA120IU	Kỹ năng tin học doanh nghiệp	Business Computing Skills	Tự chọn	3	3	0	
BA123IU	Nguyên lý trong quản lý	Principles of Management	Tự chọn	3	3	0	
BA119IU	Giới thiệu ngành Kinh tế vĩ mô	Introduction to Macro Economics	Tự chọn	3	3	0	
BA118IU	Giới thiệu ngành Tâm lý học	Introduction to Psychology	Tự chọn	3	3	0	

BA197IU	Giới thiệu ngành Xã hội học	Introduction to Sociology	Tự chọn	3	3	0	
IT011UN	Lập trình chức năng	Functional Programming	Tự chọn	3	3	0	
IT120IU	Khởi sự doanh nghiệp	Entrepreneurship	Tự chọn	3	3	0	
IT007UN	Kỹ năng thông tin và truyền thông	Skills for Communicating Information	Tự chọn	3	3	0	
IT151IU	Phương pháp thống kê	Statistical Methods	Tự chọn	3	3	0	
BM033IU	Công nghệ thông tin trong Hệ thống chăm sóc sức khỏe	Information Technology in the Health Care System	Tự chọn	3	3	0	
ENEE2001IU	Giới thiệu ngành Công nghệ kỹ thuật môi trường	Introduction to Environmental Engineering	Tự chọn	3	3	0	
ENEE2008IU	Sinh thái học môi trường	Environmental Ecology	Tự chọn	3	3	0	
CHE2041IU	Vận hành hoạt động truyền khối	Mass Transfer Operations	Tự chọn	3	3	0	

MAFE105 IU	Kinh tế học tài chính	Financial Economics	Tự chọn	3	3	0	
MAFE215 IU	Quản trị tài chính	Financial Management	Tự chọn	3	3	0	
MAFE209 IU	Thị trường tài chính	Financial markets	Tự chọn	3	3	0	
MAFE207 IU	Ra quyết định	Decision Making	Tự chọn	3	3	0	
MAFE308 IU	Quản trị rủi ro tài chính	Financial Risk Management 1	Tự chọn	3	3	0	
MAFE402 IU	Quản lý danh mục	Portfolio Management	Tự chọn	3	3	0	
PH027IU	Quan sát trái đất và môi trường	Earth Observation and The Environment	Tự chọn	3	3	0	
PH047IU	Hệ thống định vị	Navigation Systems	Tự chọn	3	3	0	
PH046IU	Hệ thống thông tin địa lý và Phân tích không gian	Geographic Information Systems (GIS) and Spatial Analysis	Tự chọn	3	3	0	
CE505IU	Địa chất học	Geotechnics	Tự chọn	3	3	0	
EE049IU	Giới thiệu ngành kỹ thuật điện	Introduction to Electrical Engineering	Tự chọn	3	3	0	
<b>Đối với sinh viên có GPA &gt; 70</b>							

<b>VIII (10 tín chỉ)</b>	IS071IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	10	10	0	
	<b>Đối với sinh viên có GPA <math>\leq 70</math>: Sinh viên học 2 môn học theo học phần</b>							
	IS094IU	Hệ thống sản xuất và chuỗi cung ứng nâng cao	Advanced Industrial and Supply Chain Systems	Bắt buộc	4	4	0	
	IS108IU	Đồ án 2	Capstone 2	Bắt buộc	6	6	0	
	<b>Tổng</b>				<b>150</b>			

**Hướng chuyên ngành Intelligent Industrial Systems:**

<b>V (20 tín chỉ)</b>	IS091IU	Hệ thống thông tin quản lý với ứng dụng ERP	Management Information Systems with ERP Applications	Bắt buộc	3	3	0		
	IS023IU	Quản lý vật tư tồn kho	Inventory Management	Bắt buộc	3	3	0		
	IS025IU	Quản lý chất lượng	Quality Management	Bắt buộc	3	3	0		
	IS085IU	CAD/CAM/ CNC	CAD/CAM/CN C	Bắt buộc	3	3	0		
	IS092IU	Phân tích, thu thập số liệu và ứng dụng	Data Collection, Analysis and Applications	Bắt buộc	3	3	0		
	IS104IU	Kỹ thuật dự báo	Time series & Forecasting Technique	Bắt buộc	2	2	0		
	<b>Môn tự chọn bắt buộc số 1 (chọn 1 môn)</b>					<b>3</b>	<b>3</b>		
	IS105IU	Hệ thống chuỗi cung ứng lạnh	Cold Chain Systems	Bắt buộc	3	3	0		



	IS087IU	Quá trình sản xuất	Manufacturing Processes	Tự chọn	3	3	0	
	IS106IU	Hệ thống thương mại điện tử	E-Commerce Systems	Tự chọn	3	3	0	
<b>VI (20 tín chỉ)</b>	IS079IU	Tiếng anh học thuật	Scientific Writing	Bắt buộc	3	3	0	
	IS027IU	Kỹ thuật điều độ trong sản xuất và dịch vụ	Scheduling & Sequencing	Bắt buộc	3	3	0	
	IS028IU	Mô hình hóa và mô phỏng	Simulation Models in IE	Bắt buộc	4	4	0	
	IS041IU	Sản xuất tinh gọn	Lean Production	Bắt buộc	3	3	0	
	IS095IU	Hệ thống công nghiệp thông minh	Industrial Intelligent Systems	Bắt buộc	3	3	0	
	IS096IU	Phân tích nâng cao dữ liệu trong thương mại và công nghiệp	Advanced Industrial Big Data Analytics	Bắt buộc	3	3	0	
<b>Hè (3 tín chỉ)</b>	IS070IU	Thực tập 2	Internship 2	Bắt buộc	3	3	0	
	IS111IU	Đồ án 1	Capstone 1	Bắt buộc	3	3	0	
	IS097IU	Các hệ thống sản xuất thông minh	Smart Manufacturing Systems	Bắt buộc	3	3	0	

<b>VII (18 tín chỉ)</b>	IS098IU	Mô hình hóa và tạo mẫu nâng cao	Advanced Modeling & Prototyping	Bắt buộc	3	3	0	
	<b>Môn tự chọn bắt buộc 2 (chọn 2 môn)</b>				<b>3</b>	<b>3</b>		
	IS080IU	Tư duy sáng tạo	Creative Thinking	Tự chọn	3	3		
	IS035IU	Kỹ thuật Hệ thống	Systems Engineering	Tự chọn	3	3		
	IS067IU	Vận chuyển quốc tế	International transportation & Logistics	Tự chọn	3	3		
	IS062IU	Thương mại điện tử trong logistics và Chuỗi cung ứng	E- Logistics in supply Management	Tự chọn	3	3		
	IS043IU	Hệ thống sản xuất linh hoạt	Flexible Manufacturing Systems	Tự chọn	3	3		
	IS045IU	Kỹ năng lãnh đạo	Leadership	Tự chọn	3	3		
	IS082IU	Quản lý bán lẻ	Retail Management	Tự chọn	3	3		
	IS066IU	Khai phá dữ liệu trong chuỗi cung ứng	Data Mining In Supply Chain	Tự chọn	3	3		
	<b>Môn tự chọn tự do (chọn 1 môn)</b>				<b>3</b>	<b>3</b>	<b>0</b>	
	PE014IU	Khoa học môi trường	Environmental Science	Tự chọn	3	3	0	

PE020IU	Đạo đức và kỹ năng nghề nghiệp của kỹ sư	Ethics and professional skills for engineers	Tự chọn	3	3	0	
BA115IU	Giới thiệu ngành Quản trị kinh doanh	Introduction to Business Administration	Tự chọn	3	3	0	
BA117IU	Giới thiệu ngành Kinh tế vi mô	Introduction to Micro Economics	Tự chọn	3	3	0	
BA120IU	Kỹ năng tin học doanh nghiệp	Business Computing Skills	Tự chọn	3	3	0	
BA123IU	Nguyên lý trong quản lý	Principles of Management	Tự chọn	3	3	0	
BA119IU	Giới thiệu ngành Kinh tế vĩ mô	Introduction to Macro Economics	Tự chọn	3	3	0	
BA118IU	Giới thiệu ngành Tâm lý học	Introduction to Psychology	Tự chọn	3	3	0	
BA197IU	Giới thiệu ngành Xã hội học	Introduction to Sociology	Tự chọn	3	3	0	
IT011UN	Lập trình chức năng	Functional Programming	Tự chọn	3	3	0	
IT120IU	Khởi sự doanh nghiệp	Entrepreneurship	Tự chọn	3	3	0	

IT007UN	Kỹ năng thông tin và truyền thông	Skills for Communicating Information	Tự chọn	3	3	0	
IT151IU	Phương pháp thống kê	Statistical Methods	Tự chọn	3	3	0	
BM033IU	Công nghệ thông tin trong Hệ thống chăm sóc sức khỏe	Information Technology in the Health Care System	Tự chọn	3	3	0	
ENEE2001IU	Giới thiệu ngành Công nghệ kỹ thuật môi trường	Introduction to Environmental Engineering	Tự chọn	3	3	0	
ENEE2008IU	Sinh thái học môi trường	Environmental Ecology	Tự chọn	3	3	0	
CHE2041IU	Vận hành hoạt động truyền khối	Mass Transfer Operations	Tự chọn	3	3	0	
MAFE105IU	Kinh tế học tài chính	Financial Economics	Tự chọn	3	3	0	
MAFE215IU	Quản trị tài chính	Financial Management	Tự chọn	3	3	0	
MAFE209IU	Thị trường tài chính	Financial markets	Tự chọn	3	3	0	
MAFE207IU	Ra quyết định	Decision Making	Tự chọn	3	3	0	

	MAFE308 IU	Quản trị rủi ro tài chính	Financial Risk Management 1	Tự chọn	3	3	0	
	MAFE402 IU	Quản lý danh mục	Portfolio Management	Tự chọn	3	3	0	
	PH027IU	Quan sát trái đất và môi trường	Earth Observation and The Environment	Tự chọn	3	3	0	
	PH047IU	Hệ thống định vị	Navigation Systems	Tự chọn	3	3	0	
	PH046IU	Hệ thống thông tin địa lý và Phân tích không gian	Geographic Information Systems (GIS) and Spatial Analysis	Tự chọn	3	3	0	
	CE505IU	Địa chất học	Geotechnics	Tự chọn	3	3	0	
	EE049IU	Giới thiệu ngành kỹ thuật điện	Introduction to Electrical Engineering	Tự chọn	3	3	0	
	<b>Đối với sinh viên có GPA &gt; 70</b>							
<b>VIII (10 tín chỉ)</b>	IS071IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	10	10	0	
	<b>Đối với sinh viên có GPA ≤ 70: Sinh viên học 2 môn học theo học phần</b>							
	IS094IU	Hệ thống sản xuất và chuỗi cung ứng nâng cao	Advanced Industrial and Supply Chain Systems	Bắt buộc	4	4	0	
	IS108IU	Đồ án 2	Capstone 2	Bắt buộc	6	6	0	
	<b>Tổng</b>				<b>150</b>			

**Hướng chuyên ngành Industrial Analytics**

Học kỳ	Mã MH	Tên MH		Loại MH (bắt buộc/tự chọn)	Tín chỉ			Môn học tiên quyết/ Môn học học trước/ Môn học song hành
		Tiếng việt	Tiếng Anh		Tổng cộng	Lý thuyết	Thực hành/ Thí nghiệm	
<b>I (19 tín chỉ)</b>	EN007IU	Tiếng Anh chuyên ngành 1	Writing AE1	Bắt buộc	2	2	0	
	EN008IU		Listening AE1		2	2	0	
	MA001IU	Giải tích 1	Calculus 1	Bắt buộc	4	4	0	
	PH013IU	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
	PH014IU	Vật lý 2	Physics 2	Bắt buộc	2	2	0	
	CH011IU	Hóa cơ bản	Chemistry for Engineers	Bắt buộc	3	3	0	
	CH012IU	Thí nghiệm Hóa	Chemistry Laboratory	Bắt buộc	1	0	1	
	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3			
<b>II (20)</b>	EN011IU	Tiếng Anh chuyên ngành 2	Writing AE2	Bắt buộc	2	2	0	
	EN012IU		Speaking AE2		2	2	0	
	MA003IU	Giải tích 2	Calculus 2	Bắt buộc	4	4	0	
	PE008IU	Tư duy phân tích	Critical Thinking	Bắt buộc	3	3	0	
	PH015IU	Vật lý 3	Physics 3	Bắt buộc	3	2	1	

<b>tín chỉ)</b>	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3			
	IS001IU	Giới thiệu ngành Kỹ thuật hệ thống công nghiệp	Introduction to Industrial Engineering	Bắt buộc	1	0	1	
	IS102IU	Vẽ kỹ thuật	Engineering Drawing	Bắt buộc	3	3	0	
<b>Hệ (5 tín chỉ)</b>	PE015IU	Triết học Mác Lênin	Philosophy of marxism and Leninism	Bắt buộc	3	3	0	
	PE016IU	Kinh tế chính trị Mác- Lênin	Political economics of marxism and leninism	Bắt buộc	2	2	0	
<b>III (21 tín chỉ)</b>	IS004IU	Xác suất thống kê cho kỹ thuật	Engineering probability and statistics	Bắt buộc	4	4	0	
	IS086IU	Tin học cho kỹ sư	Introduction to Computing	Bắt buộc	3	3	0	
	PE021IU	Pháp luật đại cương	General Law	Bắt buộc	3	3	0	
	MA027IU	Đại số tuyến tính ứng dụng	Applied Linear Algebra	Bắt buộc	2	2	0	
	IS019IU	Quản lý sản xuất	Production Management	Bắt buộc	3	3	0	
	MA023IU	Giải tích 3	Calculus 3	Bắt buộc	4	4	0	
	PE017IU	Chủ nghĩa xã hội khoa học	Scientific socialism	Bắt buộc	2	2	0	
	IS020IU	Kinh tế kỹ thuật	Engineering Economy	Bắt buộc	3	3	0	

<b>IV (20 tín chỉ)</b>	IS103IU	Vận trù học 1 – Các mô hình tất định	Deterministic Models in Operation Research	Bắt buộc	3	3	0	
	IS017IU	Đo lường lao động và Thiết kế công việc	Work design & Ergonomics	Bắt buộc	4	3	1	
	IS026IU	Quản lý dự án	Project Management	Bắt buộc	3	3	0	
	IS034IU	Thiết kế và phát triển sản phẩm	Product Design & Development	Bắt buộc	3	3	0	
	PE018IU	Lịch sử Đảng cộng sản Việt Nam	History of the Communist Party of Vietnam	Bắt buộc	2	2	0	
	PE019IU	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thought s	Bắt buộc	2	2	0	
<b>Hệ (2 tín chỉ)</b>	IS069IU	Thực tập 1	Internship 1	Bắt buộc	2	2	0	
		Quân sự	Military Training	Bắt buộc				
	IS091IU	Hệ thống thông tin quản lý với ứng dụng ERP	Management Information Systems with ERP Applications	Bắt buộc	3	3	0	
	IS023IU	Quản lý vật tư tồn kho	Inventory Management	Bắt buộc	3	3	0	
	IS025IU	Quản lý chất lượng	Quality Management	Bắt buộc	3	3	0	



<b>V (20 tín chỉ)</b>	IS085IU	CAD/CAM/ CNC	CAD/CAM/CN C	Bắt buộc	3	3	0	
	IS092IU	Phân tích, thu thập số liệu và ứng dụng	Data Collection, Analysis and Applications	Bắt buộc	3	3	0	
	IS104IU	Kỹ thuật dự báo	Time series & Forecasting Technique	Bắt buộc	2	2	0	
	<b>Môn tự chọn bắt buộc số 1 (chọn 1 môn)</b>				<b>3</b>	<b>3</b>		
	IS105IU	Hệ thống chuỗi cung ứng lạnh	Cold Chain Systems	Bắt buộc	3	3	0	
	IS087IU	Quá trình sản xuất	Manufacturing Processes	Tự chọn	3	3	0	
	IS106IU	Hệ thống thương mại điện tử	E-Commerce Systems	Tự chọn	3	3	0	
<b>VI (20 tín chỉ)</b>	IS079IU	Tiếng anh học thuật	Scientific Writing	Bắt buộc	3	3	0	
	IS027IU	Kỹ thuật điều độ trong sản xuất và dịch vụ	Scheduling & Sequencing	Bắt buộc	3	3	0	
	IS028IU	Mô hình hóa và mô phỏng	Simulation Models in IE	Bắt buộc	4	4	0	
	IS041IU	Sản xuất tinh gọn	Lean Production	Bắt buộc	3	3	0	
	IS093IU	Phân tích dữ liệu dự đoán và ứng dụng	Predictive Data Analytics and Applications	Bắt buộc	3	3	0	

	IS099IU	Phân tích nâng cao dữ liệu trong thương mại và công nghiệp	Industrial & Commercial Data Systems	Bắt buộc	3	3	0	
<b>Hệ (3 tín chỉ)</b>	IS070IU	Thực tập 2	Internship 2	Bắt buộc	3	3	0	
<b>VII (18 tín chỉ)</b>	IS111IU	Đồ án 1	Capstone 1	Bắt buộc	3	3	0	
	IS093IU	Phân tích dữ liệu dự đoán và ứng dụng	Predictive Data Analytics and Applications	Bắt buộc	3	3	0	
	IS099IU	Phân tích nâng cao dữ liệu trong thương mại và công nghiệp	Industrial & Commercial Data Systems	Bắt buộc	3	3	0	
	<b>Môn tự chọn bắt buộc 2 (chọn 2 môn)</b>				<b>3</b>	<b>3</b>		
	IS080IU	Tư duy sáng tạo	Creative Thinking	Tự chọn	3	3		
	IS035IU	Kỹ thuật Hệ thống	Systems Engineering	Tự chọn	3	3		
	IS067IU	Vận chuyển quốc tế	International transportation & Logistics	Tự chọn	3	3		
	IS062IU	Thương mại điện tử trong logistics và Chuỗi cung ứng	E- Logistics in supply Management	Tự chọn	3	3		

IS043IU	Hệ thống sản xuất linh hoạt	Flexible Manufacturing Systems	Tự chọn	3	3		
IS045IU	Kỹ năng lãnh đạo	Leadership	Tự chọn	3	3		
IS082IU	Quản lý bán lẻ	Retail Management	Tự chọn	3	3		
IS066IU	Khai phá dữ liệu trong chuỗi cung ứng	Data Mining In Supply Chain	Tự chọn	3	3		
<b>Môn tự chọn tự do (chọn 1 môn)</b>				<b>3</b>	<b>3</b>	<b>0</b>	
PE014IU	Khoa học môi trường	Environmental Science	Tự chọn	3	3	0	
PE020IU	Đạo đức và kỹ năng nghề nghiệp của kỹ sư	Ethics and professional skills for engineers	Tự chọn	3	3	0	
BA115IU	Giới thiệu ngành Quản trị kinh doanh	Introduction to Business Administration	Tự chọn	3	3	0	
BA117IU	Giới thiệu ngành Kinh tế vi mô	Introduction to Micro Economics	Tự chọn	3	3	0	
BA120IU	Kỹ năng tin học doanh nghiệp	Business Computing Skills	Tự chọn	3	3	0	

BA123IU	Nguyên lý trong quản lý	Principles of Management	Tự chọn	3	3	0	
BA119IU	Giới thiệu ngành Kinh tế vĩ mô	Introduction to Macro Economics	Tự chọn	3	3	0	
BA118IU	Giới thiệu ngành Tâm lý học	Introduction to Psychology	Tự chọn	3	3	0	
BA197IU	Giới thiệu ngành Xã hội học	Introduction to Sociology	Tự chọn	3	3	0	
IT011UN	Lập trình chức năng	Functional Programming	Tự chọn	3	3	0	
IT120IU	Khởi sự doanh nghiệp	Entrepreneurship	Tự chọn	3	3	0	
IT007UN	Kỹ năng thông tin và truyền thông	Skills for Communicating Information	Tự chọn	3	3	0	
IT151IU	Phương pháp thống kê	Statistical Methods	Tự chọn	3	3	0	
BM033IU	Công nghệ thông tin trong Hệ thống chăm sóc sức khỏe	Information Technology in the Health Care System	Tự chọn	3	3	0	

ENEE2001I U	Giới thiệu ngành Công nghệ kỹ thuật môi trường	Introduction to Environmental Engineering	Tự chọn	3	3	0	
ENEE2008I U	Sinh thái học môi trường	Environmental Ecology	Tự chọn	3	3	0	
CHE2041IU	Vận hành hoạt động truyền khối	Mass Transfer Operations	Tự chọn	3	3	0	
MAFE105I U	Kinh tế học tài chính	Financial Economics	Tự chọn	3	3	0	
MAFE215I U	Quản trị tài chính	Financial Management	Tự chọn	3	3	0	
MAFE209I U	Thị trường tài chính	Financial markets	Tự chọn	3	3	0	
MAFE207I U	Ra quyết định	Decision Making	Tự chọn	3	3	0	
MAFE308I U	Quản trị rủi ro tài chính	Financial Risk Management 1	Tự chọn	3	3	0	
MAFE402I U	Quản lý danh mục	Portfolio Management	Tự chọn	3	3	0	
PH027IU	Quan sát trái đất và môi trường	Earth Observation and The Environment	Tự chọn	3	3	0	
PH047IU	Hệ thống định vị	Navigation Systems	Tự chọn	3	3	0	

	PH046IU	Hệ thống thông tin địa lý và Phân tích không gian	Geographic Information Systems (GIS) and Spatial Analysis	Tự chọn	3	3	0	
	CE505IU	Địa chất học	Geotechnics	Tự chọn	3	3	0	
	EE049IU	Giới thiệu ngành kỹ thuật điện	Introduction to Electrical Engineering	Tự chọn	3	3	0	
	<b>Đối với sinh viên có GPA &gt; 70</b>							
	IS071IU	Khóa luận tốt nghiệp	Thesis	Bắt buộc	10	10	0	
	<b>Đối với sinh viên có GPA ≤ 70: Sinh viên học 2 môn học theo học phần</b>							
<b>VIII (10 tín chỉ)</b>	IS094IU	Hệ thống sản xuất và chuỗi cung ứng nâng cao	Advanced Industrial and Supply Chain Systems	Bắt buộc	4	4	0	
	IS108IU	Đồ án 2	Capstone 2	Bắt buộc	6	6	0	
	<b>Tổng</b>				<b>150</b>			

### 11. Ma trận các môn học và chuẩn đầu ra (kỹ năng)

(Danh sách các môn học được hệ thống theo học kỳ và phân bổ giảng dạy các kỹ năng vào các môn học: mức độ giảng dạy và trình độ năng lực yêu cầu với môn học theo trình độ năng lực. Thang đo năng lực Thầy/Cô cần xác định rõ, phù hợp với CTĐT của Thầy/Cô, khuyến khích sử dụng thang Bloom)

(Danh sách các môn học được hệ thống theo học kỳ và phân bổ giảng dạy các kỹ năng vào các môn học: mức độ giảng dạy I, T, U và trình độ năng lực yêu cầu với môn học theo trình độ năng lực)

No.	Courses code	Course	Credits	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7
<b>Semester 1</b>										
1	EN007IU	Writing AE1	2							X

2	EN008IU	Listening AE1	2							X
3	MA001IU	Calculus 1	4	X					X	X
4	PH013IU	Physics 1	2	X					X	X
5	PH014IU	Physics 2	2	X					X	X
6	PT001IU	Physical Training 1	3							
7	CH012IU	Chemistry Laboratory	1	X					X	X
8	CH011IU	Chemistry for Engineers	3	X					X	X
			<b>Total credits</b>	<b>19</b>						
<b>Semester 2</b>										
9	EN011IU	Writing AE2	2							X
10	EN012IU	Speaking AE2	2							X
11	MA003IU	Calculus 2	4	X					X	X
12	PE008IU	Critical Thinking	3			X		X		X
13	PT002IU	Physical Training 2	3							
14	IS001IU	Introduction to Industrial Engineering	1			X		X		X
15	IS102IU	Engineering Drawing	3	X					X	X
16	PH015IU	Physics 3	3	X					X	X
			<b>Total credits</b>	<b>21</b>						
<b>Summer semester</b>										
17	PE015IU	Philosophy of marxism and Leninism	3			X	X			
18	PE016IU	Political economics of marxism and leninism	2			X	X			
			<b>Total credits</b>	<b>5</b>						
<b>Semester 3</b>										
19	MA027IU	Applied Linear Algebra	2	X					X	X

20	IS019IU	Production Management	3		X		X		X	
21	IS086IU	Introduction to Computing	3	X	X				X	
22	IS004IU	Engineering Probability & Statistics	4	X					X	
23	MA023IU	Calculus 3	4	X					X	X
24	PE017IU	Scientific socialism	2			X	X			
25	PE021IU	Pháp luật đại cương	3							
		<b>Total credits</b>	<b>21</b>							
<b>Semester 4</b>										
26	IS020IU	Engineering Economy	3		X		X		X	
27	IS103IU	Deterministic models in OR	3	X	X				X	
28	IS017IU	Work design & Ergonomics	4	X	X			X	X	
29	IS026IU	Project Management	3		X		X		X	
30	IS034IU	Product Design & Development	3		X	X	X	X		
31	PE018IU	History of the Communist Party of Vietnam	2			X	X			
32	PE019IU	HCM' s thoughts	2			X	X			
		<b>Total credits</b>	<b>20</b>							
<b>Summer semester</b>										
32	IS069IU	<b>Internship 1</b>	2	X			X		X	X
33		Military Training								
		<b>Total credits</b>	<b>2</b>							
<b>Semester 5</b>										
34	IS091IU	Management Information	3			X	X	X		



		Systems with ERP Applications								
35	IS025IU	Quality Management	<b>3</b>	X	X	X	X		X	X
36	IS023IU	Inventory Management	3	X	X	X	X	X	X	X
37	IS085IU	CAD/CAM/CNC	3	X					X	X
38		Data Collection, Analysis and Applications	3	X	X	X	X	X	X	
40	IS104IU	Time series & forecasting techniques	2	X					X	X
	<b>IS__IU</b>	<b>Nhóm tự chọn số 01 - ISE Elective Course (choose 1 course below)</b>	3							
41	IS087IU	Manufacturing Processes	3	X					X	X
42	IS106IU	E-Commerce Systems	3	X	X	X	X	X	X	X
43	IS105IU	Cold Chain Systems	3	X	X	X		X		
<b>Total credits</b>			<b>20</b>							
<b>Semester 6</b>										
44	IS079IU	Scientific Writing	2							X
45	IS028IU	Simulation Models in IE	3	X	X				X	X
46	IS027IU	Scheduling & Sequencing	3	X					X	
47	IS041IU	Lean Production	3							
<b>Đối với hướng chuyên ngành General (chung)</b>										
48	IS031IU	Experimental Design	3						X	
49	IS024IU	Probabilistic Models in OR	3	X						X



60	IS100IU	Decision Analytics	3	X	X	X	X	X	X	X
61	IS101IU	Industrial Process, System Data Analysis and Modelling	3	X	X	X	X	X	X	
	IS__IU	<b>Nhóm tự chọn số 02 - ISE Elective Course (choose 2 course below)</b>	<b>3</b>							
62	IS080IU	Creative Thinking	<b>3</b>	X	X	X	X		X	X
63	IS035IU	Systems Engineering	3				X	X	X	
64	IS043IU	Flexible Manufacturing Systems	3			X	X	X		
65	IS045IU	Leadership	3	X	X	X	X	X	X	X
66	IS082IU	Retail Management	3		X		X	X		X
67	IS067IU	International Transportation & Logistics	3	X	X			X	X	
68	IS062IU	E-Logistics in Supply Chain Management	3	X	X	X	X	X	X	X
69	IS066IU	Data Mining In Supply Chain	3	X		X		X		X
70	____IU	<b>Nhóm tự chọn số 03 - Free Elective Course (choose 1 course)</b>	<b>3</b>							
		<b>Total credits</b>	<b>21</b>							
<b>Semester 8</b>										
<b>Đối với sinh viên có GPA &gt;70</b>										
71	IS048IU	Thesis	10	X	X	X	X	X	X	X
		<b>Total credits</b>	<b>10</b>							
<b>TỔNG SỐ TÍN CHỈ</b>			<b>150</b>							
<b>Đối với sinh viên có GPA &lt;= 70</b>										

Hướng chuyên ngành chung (General)									
72	IS094IU	Advanced Industrial and Supply Chain Systems	4	X	X	X	X	X	X
73	IS108IU	Capstone 2	6	X	X	X	X	X	X
<b>Total credits</b>			<b>10</b>						
<b>Total credits</b>			<b>150</b>						

<sup>4)</sup>Cột “Tên môn học”: liệt kê tất cả các môn học của CTĐT được phân bố theo học kỳ. Mỗi môn học, cần xác định rõ mức độ đóng góp vào các CDR tương ứng, và thống nhất với thông tin được xác định trong đề cương môn học. Đối với nhóm môn học tự chọn, trình độ năng lực với các CDR phải tương ứng nhau.

<sup>5)</sup>Cột “Chuẩn đầu ra của CTĐT”: liệt kê tất cả CDR của CTĐT. Chỉ lần liệt kê dưới dạng PLO<sub>i</sub>, không ghi nội dung cụ thể CDR.

**12. Mô tả vắn tắt nội dung và khối lượng các môn học (số thứ tự của môn học tương ứng với số thứ tự của môn học trong nội dung chương trình đào tạo)**

**Phương pháp triết học Mác – Lênin (Philosophy of Marxism and Leninism)**

- **Số tín chỉ:** 3 (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** không
- Môn học trang bị cho sinh viên những nội dung cơ bản về thế giới quan, phương pháp luận triết học Mác – Lênin.
- Giúp cho sinh viên vận dụng những tri thức về thế giới quan, phương pháp luận triết học Mác – Lênin một cách sáng tạo trong hoạt động nhận thức và thực tiễn, nhằm giải quyết những vấn đề mà đời sống xã hội của đất nước, của thời đại đang đặt ra.

**Kinh tế chính trị Mác–Lênin (Political economics of Marxism and Leninism):**

- **Số tín chỉ:** 2 (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** không
- Một là, trang bị cho sinh viên những kiến thức cơ bản, cốt lõi của Kinh tế chính trị Mác – Lênin trong bối cảnh phát triển kinh tế của đất nước và thế giới ngày nay. Đảm bảo tính cơ bản, hệ thống, khoa học, cập nhật tri thức mới, gắn với thực tiễn, tính sáng tạo, kỹ năng, tư duy, phẩm chất người học, tính liên thông khắc phục trùng lặp, tăng cường tích hợp và giảm tải, lược bớt những nội dung không còn phù hợp hoặc những nội dung mang tính kinh viện đối với sinh viên các trường Cao đẳng, Đại học không chuyên lý luận.
- Hai là, trên cơ sở hình thành tư duy, kỹ năng phân tích, đánh giá và nhận diện bản chất của các quan hệ lợi ích kinh tế trong phát triển kinh tế - xã hội của đất nước góp phần giúp sinh viên xây dựng trách nhiệm xã hội phù hợp trong vị trí việc làm và cuộc sống sau khi ra trường.
- Ba là, góp phần xây dựng lập trường, ý thức hệ tư tưởng Mác – Lênin đối với các

sinh viên

**Chủ nghĩa Khoa Học Xã Hội (Scientific socialism):**

- Số tín chỉ: 2 (Lý thuyết: 2, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: : 1. Triết học Mác – Lênin, 2. Kinh tế chính trị Mác – Lênin
- Môn học trang bị cho sinh viên những nội dung cơ bản của chủ nghĩa xã hội khoa học (một trong ba bộ phận cấu thành chủ nghĩa Mác – Lênin)
- Giúp cho sinh viên vận dụng những tri thức cơ bản của chủ nghĩa xã hội khoa học một cách sáng tạo trong hoạt động nhận thức và thực tiễn, nhằm giải quyết những vấn đề mà đời sống xã hội của đất nước, của thời đại đang đặt ra.

**Lịch sử Đảng Cộng Sản Việt Nam (History of the Communist Party of Vietnam):**

- **Số tín chỉ:** 2 (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** 1. Triết học Mác – Lênin, 2. Kinh tế chính trị Mác – Lênin, 3. Chủ nghĩa xã hội khoa học.
- Về nội dung: cung cấp những tri thức có tính hệ thống, cơ bản về sự ra đời của Đảng cộng sản Việt Nam (1920-1930), sự lãnh đạo của Đảng đối với cách mạng Việt nam trong thời kỳ đấu tranh giành chính quyền (1930-1945), trong hai cuộc kháng chiến chống thực dân Pháp và đế quốc Mỹ xâm lược (1945-1975), trong sự nghiệp xây dựng, bảo vệ Tổ quốc thời kỳ cả nước quá độ lên chủ nghĩa xã hội, tiến hành công cuộc đổi mới (1975-2018)
- Về tư tưởng: Thông qua các sự kiện lịch sử và các kinh nghiệm về sự lãnh đạo của Đảng để xây dựng ý thức tôn trọng sự thật khách quan, nâng cao lòng tự hào, niềm tin đối với sự nghiệp lãnh đạo của Đảng.
- Về kỹ năng: Trang bị phương pháp tư duy khoa học về lịch sử, kỹ năng lựa chọn tài liệu nghiên cứu, học tập môn học và khả năng vận dụng nhận thức lịch sử các công tác thực tiễn, phê phán quan niệm sai trái về lịch sử của Đảng.

**Tư tưởng Hồ Chí Minh (HCM's thoughts):**

- **Số tín chỉ:** 2 (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** : 1. Triết học Mác – Lênin, 2. Kinh tế chính trị Mác – Lênin, 3. Chủ nghĩa xã hội khoa học.
- Về kiến thức: Trang bị cho sinh viên những kiến thức cơ bản về khái niệm, nguồn gốc, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh; những nội dung cơ bản của tư tưởng Hồ Chí Minh; sự vận dụng của Đảng Cộng sản Việt Nam trong cách mạng dân tộc dân chủ và cách mạng xã hội chủ nghĩa, trong công cuộc đổi mới hiện nay.
- Về kỹ năng: Giúp cho sinh viên khả năng tư duy, phân tích, đánh giá, vận dụng sáng tạo tư tưởng Hồ Chí Minh vào giải quyết các vấn đề trong thực tiễn đời sống, học tập và công tác.

- Về thái độ: Giúp sinh viên nâng cao về bản lĩnh chính trị, yêu nước, trung thành với mục tiêu, lý tưởng độc lập dân tộc gắn liền với chủ nghĩa xã hội, nhận thức được vai trò, giá trị của tư tưởng Hồ Chí Minh đối với Đảng và dân tộc Việt Nam; thấy được trách nhiệm của bản thân trong việc học tập, rèn luyện để góp phần vào xây dựng và; bảo vệ Tổ quốc.

### **Tiếng Anh chuyên ngành 1 - Kỹ năng Viết (Writing AE1):**

- Số tín chỉ: 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- Mô tả nội dung môn học: Môn học nhằm nâng cao kỹ năng viết trình độ tiên nâng cao (pre-advanced). Chương trình tập trung vào việc xây dựng bài luận dựa trên các kỹ năng viết như: làm dàn bài, viết câu luận đề, kết nối và sắp xếp trình tự các đoạn, dung từ và cụm từ nối để tạo sự mạch lạc cho bài văn. Các thể loại bao gồm: miêu tả người, đồ vật, qui trình, trình bày ý kiến, so sánh và đối chiếu, nguyên nhân – kết quả, vấn đề - giải pháp, nghị luận
- Mục tiêu môn học:
  - Giúp sinh viên làm quen với phương pháp viết tiếng Anh học thuật
  - Thực hành viết bài luận
  - Nâng cao kỹ năng viết tiếng Anh học thuật

### **Tiếng Anh chuyên ngành 1 - Kỹ năng Nghe (Listening AE1):**

- Số tín chỉ: 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- Mô tả nội dung môn học: Những kỹ năng nghe tiếng Anh học thuật, ghi chú, và thảo luận sẽ giúp sinh viên làm quen với những khó khăn trong việc học tiếng Anh ở đại học. Sinh viên sẽ học các kỹ năng cần thiết cho sinh viên đại học quốc tế, bao gồm: nghe bài giảng chủ động, ghi chú hiệu quả, tham gia thảo luận tự tin. Cùng với các kỹ năng nghe, sinh viên cũng sẽ trau dồi vốn từ vựng học thuật.
- Mục tiêu môn học:
  - Rèn luyện cho sinh viên thói quen nghe một cách chủ động
  - Giúp sinh viên nâng cao vốn từ vựng tiếng Anh.
  - Giúp sinh viên nâng cao kỹ năng nghe – ghi chép.
  - Giúp sinh viên nhận dạng “ngôn ngữ của bài giảng” mà giáo viên thường sử dụng như: dấu hiệu, đặc điểm, và từ vựng của ngôn bản.
  - Trau dồi kỹ năng tư duy phân tích.

### **Tiếng Anh chuyên ngành 2 - Kỹ năng Viết (Writing AE2):**

- Số tín chỉ: 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: Tiếng Anh chuyên ngành 1 – Kỹ năng nghe (Listening AE1) và Kỹ năng Viết (Writing AE1)
- Mô tả nội dung môn học: Môn học nhằm cung cấp một cách tổng quát cấu trúc của một bài viết báo cáo nghiên cứu, từng bước giúp sinh viên hoàn tất một bài viết cụ thể trong lĩnh vực của mình. Nội dung của môn học bao gồm: các thành phần của bài

báo cáo, kỹ năng chọn và giới hạn đề tài, viết câu luận đề, làm dàn bài, tìm và dẫn chứng tài liệu, ghi chú, viết mở bài, nội dung chính và kết luận, viết và sửa chữa bản nháp. Sinh viên sẽ thực hành trên các đề tài liên quan đến môn học của mình.

- **Mục tiêu môn học:**

- Chọn và giới hạn đề tài nghiên cứu
- Hình thành, đánh giá, và sửa chữa câu luận đề
- Sắp xếp ý và viết dàn bài
- Tìm và đánh giá nguồn tài liệu
- Dẫn chứng tài liệu chính xác
- Ghi chú bằng nhiều cách

**Tiếng Anh chuyên ngành 2 - Kỹ năng Nói (Speaking AE2)**

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: Tiếng Anh chuyên ngành 1 – Kỹ năng nghe (Listening AE1) và Kỹ năng Viết (Writing AE1)
- Mô tả nội dung môn học: Môn học cung cấp cho sinh viên các chiến lược thiết thực sử dụng trong việc thuyết trình. Ngoài ra sinh viên được giúp đỡ hình thành kỹ năng lắng nghe, nhận xét và nêu ý kiến phản hồi đối với các bài thuyết trình khác trong lớp
- Mục tiêu môn học: Trang bị cho sinh viên kiến thức và kỹ năng thuyết trình bằng tiếng Anh trước công chúng: các bước chuẩn bị, chọn văn phong phù hợp, sử dụng tiếng Anh chuẩn xác nhằm truyền đạt đến đối tượng nghe thích hợp.

**Tư duy phân tích (Critical Thinking)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học: Môn học cung cấp sinh viên những kiến thức nền về tư duy phân tích, kỹ năng hữu ích đối với mọi đối tượng ngành nghề. Sinh viên thực hành với các dạng lý luận, phân tích, đánh giá các lý luận của mình và của người khác. Sinh viên được hỗ trợ các phương pháp tìm kiếm thông tin để lý luận và kiểm định lý luận.
- Critical Thinking studies a process which is indispensable to all educated persons--the process by which we develop and support our beliefs and evaluate the strength of arguments made by others in real-life situations. It includes practice in inductive and deductive reasoning, presentation of arguments in oral and written form, and analysis of the use of language to influence thought. The course also applies the reasoning process to other fields such as business, science, law, social science, ethics, and the arts.

**Giải tích 1 (Calculus 1)**

- Số tín chỉ: 4 tín chỉ (Lý thuyết: 4, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không

- Mô tả nội dung môn học:
- Hàm số, Giới hạn, Tính liên tục, Đạo hàm, Đạo hàm cho các hàm cơ bản, Quy tắc L'Hospital, Tối ưu, Phương pháp Newton, Tích phân, Tích phân xác định, Các định lý cơ bản của giải tích, kỹ thuật tích phân.
- *Functions; Limits; Continuity; Derivatives, Differentiation, Derivatives of Basic Elementary Functions, Differentiation Rules; Applications of Differentiation: l'Hôpital's Rule, Optimization, Newton's Method; Anti-derivatives; Indefinite Integrals, Definite Integrals, Fundamental Theorem of Calculus; Techniques of Integration; Improper Integrals; Applications of Integration*

### **Giải tích 2 (Calculus 2)**

- Số tín chỉ: 4 tín chỉ (Lý thuyết: 4, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: Giải tích 1
- Mô tả nội dung môn học:
- Dãy và Chuỗi; Các kiểm chứng hội tụ; Chuỗi hàm mũ; Chuỗi Taylor và Maclaurin; Tọa độ Descartes; Đường, mặt phẳng và các bề mặt; Các hàm vecto và tích phân, Chiều dài cung và đường cong, tham số bề mặt; Hàm đa biến; Giới hạn, liên tục, vi phân từng phần, mặt phẳng tiếp tuyến; Các vector gradient; cực trị; Đa thức Lagrange; Tích phân nhiều lớp: Tích phân hai lớp, Tích phân ba lớp, kỹ thuật hội tụ; Các miền vector, Tích phân đường, Tích phân mặt.
- *Sequence and Series; Convergence Tests; Power Series; Taylor and Maclaurin Series; Cartesian Coordinates; Lines, Planes and Surfaces; Derivatives and Integrals of Vector Functions, Arc Length and Curvature, Parametric Surfaces; Functions of Several Variables; Limits, Continuity, Partial Derivatives, Tangent Planes; Gradient Vectors; Extrema; Lagrange Multipliers; Multiple Integrals: Double Integrals, Triple Integrals, Techniques of Integration; Vector Fields, Line Integrals, Surface Integrals.*

### **Vật lý 1 (Physics 1)**

- Số tín chỉ: 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Khảo sát động học, động lực học, năng lượng học của chuyển động của chất điểm và của vật rắn. Khảo sát động lực học lưu chất, tính chất của khí lí tưởng, và các nguyên lí nhiệt động lực học.
- *This course examines concepts and principles of kinetics, dynamics, energetics of motion of a material particle, solid, fluid dynamics, properties of ideal gas, and thermodynamics*

### **Vật lý 2 (Physics 2)**

- Số tín chỉ: 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)



- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Khảo sát động lực học lưu chất, tính chất của khí lí tưởng, và các nguyên lí nhiệt động lực học.
- *This course provides students basic knowledge about fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gases and the kinetic theory of gases.*

### **Vật lý 3 (Physics 3)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Giới thiệu sinh viên kỹ lưỡng về các nguyên tắc cơ bản của vật lý cho sinh viên vật lý và chuẩn bị hành trang cho họ nghiên cứu thêm về vật lý và hỗ trợ sự hiểu biết và thiết kế các ứng dụng thực tế trong lĩnh vực của họ. Nội dung: Tĩnh điện, hạt trong điện trường và từ trường, điện từ, mạch điện, phương trình Maxwell, bức xạ điện từ.
- *To provide a thorough introduction to the basic principles of physics to physics and engineering students in order to prepare them for further study in physics and to support their understanding and design of practical applications in their fields. Content: Electrostatics, particles in electric and magnetic fields, electromagnetism, circuits, Maxwell's equations, electromagnetic radiation.*

### **Thí nghiệm hóa học (Chemistry laboratory)**

- Số tín chỉ: 1 tín chỉ (Lý thuyết: 0, Thực hành: 1)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Môn học này được thiết kế cho các chuyên ngành không chuyên về hóa học, vì nó dành cho sinh viên đang học kỹ thuật như điệ, công nghệ thông tin, .... Môn học giới thiệu các công việc trong phòng thí nghiệm với sự nhấn mạnh vào các kỹ thuật liên quan đến hóa học.
- *This course is designed for non-chemistry majors, as it is intended for students pursuing a degree in information technology, electronic and telecommunication. The course introduces the lab-work with emphasis on techniques relevant to engineering in chemistry.*

### **Hóa cơ bản (Chemistry for Engineers)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Môn học thiết kế dành cho sinh viên ngoài ngành kỹ thuật hóa học. Môn học

cung cấp các nguyên lý cơ bản về hoá học cần thiết để tiếp thu kiến thức ở các môn học cơ sở. Nội dung của môn học bao gồm bản chất hóa học của vật chất, trạng thái của vật chất, liên kết hóa học, độ bền hóa học, cấu trúc hóa học, phản ứng hóa học, cân bằng hóa học, tốc độ phản ứng, nhiệt động học, năng lượng hóa học, điện hóa học, lực tương tác giữa các phân tử, phức chất và hóa học hạt nhân.

- *This course is designed for non-chemistry majors. The course provides a strong background in the fundamentals of chemistry, preparing students for further study in their major field. Topics include important principles, theories, concepts of chemistry, and chemical calculations necessary for a comprehension of the structure of matter, the chemical actions of the common elements and compounds. The impact of chemistry on everyday life and on the environment is also introduced wherever possible.*

### **Giải tích 3 (Calculus 3):**

- **Số tín chỉ:** 4 tín chỉ (Lý thuyết: 4, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** Giải tích 1, Giải tích 2
- Mô tả nội dung môn học: Số phức, chuỗi phức, hàm phức, đạo hàm phức; Biến đổi Laplace, biến đổi z, chuỗi Fourier, biến đổi Fourier, biến đổi ngược, biến đổi của đạo hàm và tích phân, phương trình đạo hàm riêng cấp một, phương trình đạo hàm riêng cấp hai, phương trình đạo hàm riêng, những ứng dụng trong mạch điện và xử lý tín hiệu.
- Mục tiêu môn học:
  - Kiến thức về số phức và chuỗi, hàm phức và đạo hàm phức
  - Kiến thức về biến đổi Laplace, biến đổi z, chuỗi Fourier và biến đổi Fourier, phổ Fourier, đáp ứng tần số
  - Những kỹ năng toán và tính toán để giải phương trình đạo hàm riêng và trong những lĩnh vực như mạch điện, viễn thông, xử lý tín hiệu và điều khiển.
  - Phát triển sự tự tin và thành thạo trong việc thảo luận toán bằng tiếng anh.

### **Đại số tuyến tính ứng dụng (Applied Linear Algebra)**

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** không
- Mô tả nội dung môn học:
  - Môn học cung cấp cho sinh viên kiến thức cơ bản về đại số tuyến tính với các ứng dụng, đặc biệt là kỹ năng giải các hệ phương trình tuyến tính bằng phương pháp khử Gauss.
  - *The course provides the student with basic knowledge in linear algebra with applications, in particular the skill of solving linear systems of equations using Gauss elimination method.*

### **Pháp luật đại cương (General Law)**

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)

- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Cung cấp những kiến thức cần thiết về hệ thống pháp luật Việt Nam thông qua công nghệ tích hợp và các trường hợp thực tế cho sự bền vững về xã hội và văn óa.
- Nâng cao nhận thức về trách nhiệm đối với người khác và cách bảo vệ chấm dứt các loại vi phạm pháp luật, đặc biệt là tham nhũng trong các lĩnh vực xã hội.
- Rèn luyện các kỹ năng cần thiết để đóng vai trò là đại sứ đảm bảo xã hội công bằng và quyền bình đẳng toàn cầu.
- Sử dụng các nguồn pháp lý trực tuyến tích hợp và các công cụ truyền thông để trợ giúp cộng đồng để xác định các vấn đề và phát triển các biện pháp đối phó.

### **Xác suất thống kê cho kỹ thuật (Engineering Probability and Statistics)**

- Số tín chỉ: 4 tín chỉ
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Môn học khảo sát các khái niệm khác nhau trong xác suất và thống kê, thảo luận về các kỹ thuật thống kê và ứng dụng trong các tình huống thực tế. Các chủ đề chính của môn học bao gồm: thống kê mô tả, biến ngẫu nhiên rời rạc và liên tục, lấy mẫu và phân bố mẫu, khoảng tin cậy, thử nghiệm giả thuyết, phân tích phương sai, hồi quy tuyến tính.
- *The aim of this course is to examine various concepts in probability and statistics. This course also discusses various statistical techniques and the use of them in practical situations. Key topics of this course include: descriptive statistics, discrete and continuous random variables, sampling and sampling distributions, confidence intervals, hypothesis testing, analysis of variance, simple linear and multiple regressions.*

### **Kinh tế kỹ thuật (Engineering Economy)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Tất cả các quyết định về quản lý và kỹ thuật đều mang đến những hệ quả về kinh tế, như là lợi nhuận hoặc rủi ro. Môn học này cung cấp những kiến thức và kỹ thuật cần thiết đánh giá các phương án ra quyết định. Các chủ đề được trình bày trong môn học này gồm có: khấu hao, ước lượng và quản lý chi phí, thuế, lạm phát, rủi ro và không chắc chắn trong việc ra quyết định, phân tích phương án thay thế thiết bị, phân tích dòng tiền tệ.
- *Economic decisions involving engineering alternatives; annual cost, present & future worth, rate of return, and benefit-to-cost; before and after tax replacement*

### **Quản lý sản xuất (Production management)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Sau khi học xong môn này, sinh viên có thể hiểu rõ vai trò, mục tiêu và quy trình quản lý sản xuất và điều hành trong doanh nghiệp. Phân tích một vấn đề trong kinh doanh, cung cấp các giải pháp quản lý sản xuất, điều hành, quản lý chuỗi cung ứng để tối ưu hóa hệ thống nội bộ. Ứng dụng các công cụ phân tích ví dụ như mô hình kiểm soát hàng tồn kho, để đáp ứng nhu cầu cạnh tranh trong và ngoài nước và đưa ra quyết định trong kinh doanh.
- *On completion of this unit students will be able to: Articulate the role, objectives and processes of operations management and how operations management is applied in businesses, Analyse a business problem to provide operations management solutions to optimise internal systems including production scheduling and supply chain management, Utilise a range analytical tools such as inventory control models to satisfy competing internal and external demands and make business decisions.*

### **Giới thiệu về ngành kỹ thuật hệ thống công nghiệp (Introduction to Industrial Engineering):**

- Số tín chỉ: 1 (Lý thuyết: 0, Thực hành: 1)
- Điều kiện tiên quyết/Môn học trước: Không
- Mô tả nội dung môn học: Môn học giới thiệu về ngành Kỹ thuật Hệ thống Công nghiệp trong hệ thống các ngành kỹ thuật ở Việt Nam và khu vực, đề cập đến các ứng dụng trong công nghiệp, bao gồm sản xuất và dịch vụ. Môn học này cũng cung cấp những phương tiện thực hành để làm quen với công nghệ. Sinh viên sẽ dùng ngôn ngữ C/ C++ để viết các chương trình.
- Mục tiêu môn học: Môn học giới thiệu về ngành Kỹ thuật Hệ thống Công Nghiệp, các vấn đề và ứng dụng.

### **CAD/CAM/CNC (CAD/CAM/CNC):**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 2, Thực hành: 1)
- Điều kiện tiên quyết/Môn học trước: Không
- Mô tả nội dung môn học: Môn học này giới thiệu cho sinh viên về các phương pháp sản xuất hiện đại với trọng tâm đặt tại ba lĩnh vực: thiết kế với hỗ trợ của máy tính, sản xuất với hỗ trợ của máy tính, và lập kế hoạch quy trình với hỗ trợ của máy tính. Môn học này sẽ cung cấp các kiến thức, khái niệm, công nghệ quan trọng và những sự phát triển tiên tiến trong CAD/CAM. Các chủ đề được trình bày trong môn học này gồm có: các đặc điểm kỹ thuật trong thiết kế chi tiết, lập trình NC, lập kế hoạch quy trình đơn giản và với sự hỗ trợ của máy tính, các hệ thống CAD và CAM, hệ thống trao đổi dữ liệu CAD/CAM.
- Mục tiêu môn học:
  - Có được những hiểu biết cơ bản về các khái niệm trong CAD/CAM.
  - Sử dụng các phần mềm CAD/CAM để thiết kế kỹ thuật.

- Hiểu được các ứng dụng của CAD/CAM vào những giai đoạn khác nhau trong quá trình thiết kế và sản xuất một sản phẩm.

#### **Vẽ kỹ thuật (Engineering Drawing):**

- Số tín chỉ: 3 (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: Không
- Mô tả nội dung môn học:
- Môn học này cung cấp cho sinh viên các kỹ năng để trình bày và giải thích các mô hình không gian trên các mô hình phẳng, trình bày các bản vẽ kỹ thuật theo tiêu chuẩn quốc tế (ISO). Các phương pháp trình bày mô hình: phép chiếu trục giao, phép chiếu đẳng cự, phép chiếu xiên Áp dụng các hình chiếu để trình bày các đối tượng trong bản vẽ.

#### **Tin học cho kỹ sư(Introduction to computing)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Môn học giới thiệu về MATLAB, gói công cụ lập trình cho kỹ sư và nhà khoa học. Sinh viên sẽ học các cơ bản về MATLAB, cách viết chương trình MATLAB, và cách giải quyết những bài toán kỹ thuật bằng MATLAB. Môn học sẽ chú trọng đến những kỹ năng giải quyết vấn đề và công cụ toán quan trọng trong kỹ thuật
- *Introduction to MATLAB, a powerful programming package for engineers and scientists. Students will learn the fundamentals of MATLAB, how to write programs in MATLAB, and how to solve engineering problems using MATLAB. Emphasis on problem-solving skills and mathematical tools of importance in engineering.*

#### **Vận trù học 1- Các mô hình tất định (Deterministic model in OR)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: Xác xuất thống kê cho kỹ thuật
- Mô tả nội dung môn học:
- Môn học trang bị các kiến thức cơ bản về qui hoạch toán học như qui hoạch tuyến tính, qui hoạch phi tuyến, qui hoạch động, qui hoạch nguyên. Các qui hoạch toán học này là những công cụ quan trọng cho việc phân tích các mô hình tất định để tối ưu hóa các bài toán thực tế trong quản lý sản xuất và dịch vụ cũng như trong các lĩnh vực khác.
- *Elements of problem solving and algorithmic design. Use of numerical analysis and linear algebra to solve industrial engineering problems. Topics to be covered include: problem formulations, simplex method in tableau form, duality theory, an introduction to the geometry of the simplex method, sensitivity analysis, transportation and network flow problems, optimality conditions and basic numerical methods for nonlinear programs.*

### **Work design & Ergonomics + Lab**

- Số tín chỉ: 4 tín chỉ (Lý thuyết: 3, Thực hành: 1)
- Điều kiện tiên quyết: không. Môn học trước: Không
- Mục tiêu của môn học: Môn học này giới thiệu cho sinh viên những kiến thức cơ bản về đo lường công việc, phân tích phương pháp và nghiên cứu lao động. Môn học này chú trọng vào các phương pháp phân tích định lượng.
- **Mô tả vắn tắt nội dung:** Phân tích các thao tác, thiết kế công việc thủ công, thiết kế vị trí làm việc, môi trường làm việc, định mức thời gian cho công việc, cách đánh giá hiệu suất công việc.

### **Thiết kế và phát triển sản phẩm (Product Design & Development):**

- Số tín chỉ: 4 tín chỉ (Lý thuyết: 3, Thực hành: 1)
- Điều kiện tiên quyết: Xác xuất thống kê cho kỹ thuật
- Mô tả nội dung môn học:
- Mục tiêu của môn học: Môn học này cung cấp cho sinh viên kiến thức về sự phát triển của các sản phẩm sáng tạo và thiết thực hướng tới khách hàng. Các khái niệm và kỹ thuật thiết kế sẽ được thảo luận, bên cạnh việc tối ưu thiết kế, cùng với các vấn đề kinh tế và xã hội có liên quan. Sau khi hoàn thành môn học này, sinh viên sẽ hiểu được các quy trình phát triển sản phẩm mới, các công cụ, kỹ thuật và cấu trúc tổ chức hữu ích hỗ trợ cho quá trình phát triển sản phẩm mới.
- Mô tả vắn tắt nội dung: Môn học này sẽ trình bày những chủ đề về kỹ thuật và kinh tế quan trọng đối với việc phát triển các sản phẩm kỹ thuật. Thiết kế tối ưu, các suy nghĩ sáng tạo, các nguyên lý và phương pháp luận về phát triển sản phẩm sẽ được nhấn mạnh. Sinh viên sẽ được học những quy trình phát triển sản phẩm mới, các công cụ, kỹ thuật, và các cấu trúc tổ chức nền tảng của quy trình phát triển sản phẩm

### **Mô hình hóa và mô phỏng (Simulation models in industrial Engineering)**

- Số tín chỉ: 4 tín chỉ (Lý thuyết: 3, Thực hành: 1)
- Điều kiện tiên quyết: Xác xuất thống kê cho kỹ thuật
- Mô tả nội dung môn học:
- Môn học trang bị các kiến thức cơ bản để mô phỏng hệ thống thực với các nội dung xây dựng mô hình, chọn phân bố, mô phỏng các biến ngẫu nhiên..., qua đó phân tích tìm hiểu hoạt động của hệ thống, trợ giúp ra quyết định cho việc so sánh, tối ưu hóa hệ thống.
- Modeling and analysis of industrial and service systems, modeling perspectives, discrete event and continuous simulation, model building using ARENA/SIMAN, statistical aspects of simulation.

### **Kỹ thuật điều độ trong Sản xuất và Dịch vụ (Scheduling & Sequencing)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)

- Điều kiện tiên quyết: Vận trù học 1 – Các mô hình tất định
- Mô tả nội dung môn học:
- Mục đích môn học nhằm cung cấp các kiến thức từ các khái niệm cơ bản đến các kinh nghiệm thực tiễn trong công tác điều độ. Môn học này sẽ giới thiệu các giải thuật điều độ cho máy đơn, máy song song, mô hình flow shop, job shop. Đồng thời môn học cũng cung cấp các phương pháp để giải quyết những vấn đề điều độ như giải thuật kinh nghiệm, giải thuật xây dựng, phương pháp phân nhánh – giới hạn (Branch-and-Bound).
- *This course gives an introduction to scheduling problems: techniques, principles, algorithms and computerized scheduling systems. Topics include scheduling algorithms for single machine, parallel machine, flow shop, job shop and also solution methodologies such as heuristic procedures, constructive algorithms, branch and bound approaches, and genetic algorithms.*

### **Quản lý vật tư tồn kho (Inventory management)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
  - Điều kiện tiên quyết: không
- Môn học trước: Xác suất thống kê cho kỹ thuật
- Mô tả nội dung môn học:
  - Mọi tổ chức đều lưu trữ nguyên vật liệu để ứng phó với những biến đổi và sự không chắc chắn trong cung và cầu. Tồn kho được bổ sung bởi việc giao hàng từ nhà cung cấp và giảm đi khi đáp ứng nhu cầu của khách hàng. Quản lý hàng tồn kho chịu trách nhiệm cho tất cả các khía cạnh của quản lý kho. Mức tồn kho cao làm cho chi phí tăng cao và các tổ chức liên tục tìm cách giảm chi phí hàng tồn kho của họ mà không làm ảnh hưởng đến dịch vụ của mình. Môn học này cung cấp cho sinh viên sự hiểu biết về các nguyên lý, quy trình và phương pháp quản lý hiệu quả hàng tồn kho liên quan đến các hoạt động khác trong chuỗi cung ứng. Môn học xem xét các phương pháp liên quan đến nhu cầu độc lập và nhu cầu phụ thuộc. Môn học cũng nhấn mạnh đến các thông tin cần thiết để hỗ trợ các phương pháp, bao gồm cả thông tin từ các Hệ thống thông tin quản lý với ứng dụng ERP hàng tồn kho, dự báo nhu cầu và hoạt động theo kế hoạch.
  - *Every organisation holds stocks of materials to allow for variations and uncertainty in supply and demand. Stocks are replenished by deliveries from suppliers and reduced to meet demands from customers. Inventory management is responsible for all aspects of stock control. High stock buffer comes at a high price and organisations are continually looking for ways of reducing their inventory costs without affecting service. This course provides students with an understanding of the principles, processes and methods for the effective management of inventory in relation to other activities in the supply chain. The course examines both the independent demand and dependent demand methods. Attention is given to the information needed to support these methods, including information from the inventory Management Information Systems with ERP Applications, forecasts of demand and planned operations.*

### **Hệ thống thông tin quản lý với ứng dụng ERP (Management Information Systems with ERP Applications)**

- **Số tín chỉ:** 3 (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** Không.
- **Mục tiêu của môn học:** Sau khi hoàn thành môn học này, sinh viên sẽ có khả năng:
  - Áp dụng các khái niệm về hệ thống và thông tin vào doanh nghiệp
  - Xác định nhu cầu của doanh nghiệp đối với thương mại điện tử. Áp dụng các công cụ phát triển vào hệ thống thông tin doanh nghiệp
  - Thảo luận những vấn đề về đạo đức, bảo mật, và quản lý toàn cầu khi mà chúng có liên quan đến hệ thống thông tin máy tính.
- **Mô tả vắn tắt nội dung:**
- Môn học nhằm trang bị cho sinh viên các kiến thức nền tảng về Hệ thống thông tin quản lý với ứng dụng ERP. Vai trò của hệ thống thông tin trong công tác quản lý được phân tích. Các kỹ năng, công cụ đánh giá, phân tích và Thiết kế thực nghiệm thông tin được trình bày.

### **Tiếng anh học thuật (Scientific writing)**

- **Số tín chỉ:** 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)
- **Điều kiện tiên quyết/Môn học trước:** không
- **Mô tả nội dung môn học:**
- Môn học này cung cấp cho sinh viên đại học khả năng viết một cách khoa học. Môn học nhằm mục đích cải thiện văn bản học thuật và khoa học của sinh viên bằng tiếng Anh, và giúp họ hoàn thành thành công các báo cáo môn học, luận văn, luận văn và bài báo để xuất bản cũng như trình bày thích hợp. Sau khi hoàn thành môn học, chúng tôi hy vọng sinh viên của chúng tôi trở thành hiệu quả hơn, hiệu quả hơn, và nhà văn tự tin hơn.
  - *This course is offered for undergraduate students at School of IEM, IU. It aims to improve students' academic and scientific writing in English, and helps them successfully complete course reports, thesis, dissertations, and articles for publication as well as doing a proper presentation, etc. Upon completion of the course, we hope our students become more effective, more efficient, and more confident writers.*

### **Kỹ thuật thiết kế chuỗi cung ứng và Logistics (Logistics engineering & supply chain design)**

- **Số tín chỉ:** 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- **Điều kiện tiên quyết:** không. Môn học trước: Vận trù học 1 – Các mô hình tất định
- **Mô tả nội dung môn học:** Môn học này nhằm mục đích phát triển sự hiểu biết về các khái niệm và nội dung chính yếu của Quản lý chuỗi cung ứng; phát triển sự hiểu biết về cấu trúc Chuỗi cung ứng và Hậu cần, và cách thiết kế chuỗi cung ứng hiệu quả; xây



dựng và giải quyết các vấn đề liên quan đến hậu cần và chuỗi cung ứng với các kỹ thuật tối ưu hóa.

*This course aims to:*

- Develop an understanding of concepts and key points of Supply Chain Management.
- Develop an understanding of Logistics and Supply Chain structure, and how to design an effective supply chain.
- Formulate and solve problems related to logistics and supply chain with optimization techniques.

### **Đồ án 1 (Captone 1)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:
- Đồ án là một môn học kéo dài một học kỳ được thực hiện vào năm cuối. Sinh viên tham gia vào một dự án nghiên cứu tập trung vào các vấn đề kinh tế, xã hội và môi trường để nghiên cứu một hệ thống hiện tại, xác định vấn đề có thể và khám phá các thành tựu nghiên cứu đã được công bố trong một lĩnh vực nghiên cứu mà sinh viên đã đồng ý với các cố vấn luận án để hỗ trợ và phát triển trong luận án sau này. Môn học này là dự án cá nhân. Kết quả là, sinh viên phải phát triển một mô-đun hoặc hệ thống nguyên mẫu với các yêu cầu cấp độ cơ bản mà sinh viên có thể cải thiện và phát triển trong luận án.
- *Capstone project is a semester-long course taken at the senior year. Students engage in a research project focused on economic, social and environmental problems to study a current system, identify the possible problem, and explore in literature published research achievements in a research field that students have already agreed upon with potential thesis advisors in order to support and develop in thesis later. This research is individual work. Students and advisors meet to discuss together as much as needed. In the result, students have to develop a prototype module or system with the basic level requirements that it can improve and develop in the thesis.*

### **Hệ thống sản xuất tinh gọn (Lean Production)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: Không
- Mục tiêu của môn học:
- Sau khi hoàn thành môn học này sinh viên sẽ có khả năng:
- Phân tích những dạng lãng phí phổ biến trong công nghiệp.
- Mô tả ảnh hưởng của lãng phí đến khả năng cạnh tranh và lợi nhuận của tổ chức.
- Phân biệt các dạng chiến lược khác nhau trong sản xuất tinh gọn.
- Liên hệ giữa các nguyên lý chất lượng với chiến lược sản xuất tinh gọn.
- Xác định các phương pháp để đo lường tinh gọn.

- Phát triển chiến lược để áp dụng sản xuất tinh gọn.

- **Mô tả vắn tắt nội dung:**

Môn học này giới thiệu cho sinh viên những nguyên lý và thực tiễn của sản xuất tinh gọn. Môn học này sẽ cung cấp cho sinh viên nền tảng cơ bản về sản xuất tinh gọn, phương pháp đánh giá các hệ thống sản xuất, các công cụ và kỹ thuật trong sản xuất tinh gọn, các vấn đề nhân sự, huấn luyện, văn hóa doanh nghiệp liên quan đến sản xuất tinh gọn, lập kế hoạch để tiến hành sản xuất tinh gọn và sự cần thiết của cải tiến bền vững. Các ví dụ về ứng dụng trong sản xuất và kinh doanh cũng sẽ được trình bày trong môn học này.

### **Quản lý Chất lượng (Quality Management)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: Xác suất thống kê cho kỹ thuật
- Mô tả nội dung môn học:

Môn học này cung cấp cho sinh viên những hiểu biết về các nguyên lý, khái niệm và các kỹ thuật cơ bản liên quan đến Quản lý chất lượng tổng thể. Môn học ban đầu sẽ tập trung vào các khái niệm về chất lượng và sự đóng góp của các chuyên gia về quản lý chất lượng. Tiếp theo, môn học sẽ giúp tìm hiểu quá trình thực hiện TQM, các giải thưởng và chứng nhận về chất lượng thường được áp dụng trong doanh nghiệp để đánh giá kết quả thực hiện của doanh nghiệp đó. Các vấn đề trên cũng liên quan đến việc quản lý các phản ánh của khách hàng và thị trường. Sau đó môn học sẽ giúp tìm hiểu các kỹ thuật khác nhau có thể được sử dụng để thiết kế và nâng cao chất lượng sản phẩm và dịch vụ.

*This course provides students with an understanding of the fundamental principles, concepts and techniques relating to Total Quality Management. This course will first focus on quality concepts and the contributions of various quality gurus to quality management. Next, we will explore the implementation process of TQM and the major quality awards and certifications sought after by organisations in their quest for performance excellence. This will be followed by the management of the Voice of the Customer and the Voice of the Market. We will then explore the different techniques that can be used to design and improve quality in products and services.*

### **Quản lý dự án (Project management)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: không. Môn học trước: Vận trù học 1 – Các mô hình tất định
- Mô tả nội dung môn học:

Môn học này cung cấp các khái niệm cơ bản về quản lý dự án được mô tả thông qua quyển hướng dẫn về quản lý dự án (PMBOK Guide). Quyển hướng dẫn này nhấn mạnh về năm nhóm quy trình quản lý dự án, gồm có: khởi tạo, lập kế hoạch, thực thi, kiểm soát, và kết thúc. Đồng thời, quyển sách cũng nhấn mạnh về chín khối kiến thức

của dự án bao gồm: tích hợp, phạm vi, thời gian, chi phí, chất lượng, nhân lực, thông tin, rủi ro, và mua sách. Bên cạnh đó, môn học cũng cung cấp kiến thức về các phần mềm máy tính hỗ trợ cho quản lý dự án như Microsoft Project. Hoạch định và thực hiện dự án là những hoạt động quan trọng trong phát triển công nghiệp. Môn học trang bị các kiến thức cơ bản để xem xét toàn bộ các giai đoạn của dự án với các khía cạnh quản lý, kinh tế, kỹ thuật, và tài chính qua đó có thể quản lý dự án một cách hiệu quả. Môn học bao gồm các nội dung: xác định, đánh giá và chọn lựa dự án, cấu trúc dự án, điều độ dự án, quản lý nguồn lực, công nghệ, ngân sách, chi phí, kiểm soát dự án, kết thúc dự án. Môn học còn trang bị kiến thức về các dự án nghiên cứu & phát triển, về hỗ trợ máy tính trong quản lý dự án.

*This course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). This guide emphasizes the five project process groups of initiating, planning, executing, controlling and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources, communication, risk, and procurement management. In addition, this course also provides a computer aid for project management by introducing the application of Microsoft Project and project scheduling.*

### **Kỹ thuật dự báo (Timeseries & Forecasting technique)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: không. Môn học trước: Xác xuất thống kê cho kỹ thuật
- Mô tả nội dung môn học:

Định nghĩa đơn giản nhất của dự báo là một quá trình với mục tiêu dự đoán các sự kiện hoặc điều kiện ở tương lai một cách chính xác nhất có thể nhằm ra quyết định tốt hơn. Mục tiêu của môn học trang bị cho sinh viên các kiến thức: Sự thiết lập và các đặc điểm của các mô hình dự báo. Thu thập, diễn dịch, tổ chức, phân tích dữ liệu để xây dựng các mô hình dự báo. Các khái niệm nền tảng về thống kê và xác suất dung trong dự báo. Các cấu trúc thứ bậc của các mô hình dự báo. Sử dụng các phần mềm trong hoạt động dự báo.

*The simplest definition of economic forecasting is that it is a process that has as its objective the prediction of future events or conditions to reduce that uncertainty so that our decisions will be better ones. Specific objectives are to instruct you in: the formulation and specification of forecasting models; data collection, interpretation, organization, and analysis for building forecasting models; fundamental statistical and probability concepts used in forecasting; the existence of a hierarchy of forecasting models; the use of econometric software in a lab setting.*

### **Data Collection, Analysis and Applications (Phân tích, thu thập số liệu và ứng dụng)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)

- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:  
Phân tích, thu thập số liệu và ứng dụng là môn học về: cách thu thập, sắp xếp, phân tích và trực quan hóa dữ liệu theo cách chính xác nhất. Cách thu thập dữ liệu, phân tích dữ liệu và trực quan hóa dữ liệu à một trong những kỹ năng, công cụ và khái niệm mà bạn cần để thành công trong tương lai bất kể chuyên ngành hiện tại của bạn là gì. Sinh viên sẽ học và thực hành cách xử lý dữ liệu một cách chuyên nghiệp và có trách nhiệm.

### **Vẽ kỹ thuật (Engineering Drawing)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:  
Vẽ kỹ thuật là môn học mang tính chất thực hành nhằm bồi dưỡng cho sinh viên có khả năng đọc và lập các bản vẽ kỹ thuật. Trong quá trình học tập, sinh viên phải nắm được các kiến thức cơ bản, lý luận về phép chiếu, các phương pháp biểu diễn vật thể, các tiêu chuẩn về bản vẽ...; Đồng thời phải chú trọng rèn luyện kỹ năng thực hành; kỹ năng đọc và lập các bản vẽ kỹ thuật.

*This course provides students skills to present and interpret spatial models on planar models, present engineering drawings according to international standards (ISO). Methods of presenting models: orthogonal projection, isometric projection, oblique projection... Apply the projections to present objects in the drawings*

### **Vận trù học 2 – Các mô hình ngẫu nhiên (Probabilistic Models in OR)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: Xác suất thống kê cho kỹ thuật
- Mô tả nội dung môn học:  
Môn học trình bày các phương pháp định lượng và thống kê, được ứng dụng chủ yếu trong kỹ thuật ra quyết định. Các phương pháp được giới thiệu và tìm hiểu chi tiết bao gồm kiểm định giả thuyết thống kê, phân tích tương quan và hồi quy, dự báo, quy hoạch tuyến tính, phân tích cây ra quyết định, và quản lý dự án.

### **Thiết kế thực nghiệm (Experimental Design)**

- Số tín chỉ: 3 (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: Xác suất thống kê cho kỹ thuật (Engineering Probability & Statistics)
- Mục tiêu của môn học:
  - Lập kế hoạch, thiết kế, và tiến hành các thực nghiệm một cách hiệu quả. Một thực nghiệm được thiết kế tốt sẽ cho phép thu được kết quả đáng tin cậy, hợp lệ nhanh hơn, dễ dàng hơn, và tiêu hao ít nguồn lực hơn là một thực nghiệm được thiết kế kém.
  - Phân tích dữ liệu thu được từ thực nghiệm để đạt được các kết luận có ý nghĩa.
  - Sử dụng hiệu quả các từ chuyên ngành dùng trong thiết kế thực nghiệm.

- Mô tả vấn đề nội dung:

□ Môn học này cung cấp cho sinh viên kiến thức về lập kế hoạch để tiến hành nhiều loại thực nghiệm khác nhau, áp dụng các kỹ thuật thống kê vào việc phân tích và diễn giải kết quả của thực nghiệm. Các chủ đề được trình bày trong môn học này gồm có: thiết kế thực nghiệm thừa số, thiết kế khối ngẫu nhiên hóa, thiết kế khối không hoàn chỉnh, thiết kế hình vuông Latinh, thiết kế lai, và thiết kế tối ưu.

### **Kỹ thuật ra quyết định đa mục tiêu (Multi – Criteria decision making)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)

- Điều kiện tiên quyết: Xác suất thống kê cho kỹ thuật; Môn học trước: Vận trù học 1 – Các mô hình tất định

- Mô tả nội dung môn học:

Kỹ thuật ra quyết định (KTRQĐ) là một phần quan trọng trong lĩnh vực vận trù học (Operations Research) hay Khoa học quản lý (Management Science). KTRQĐ giúp các nhà ra quyết định chọn lựa các phương án dựa trên các tiêu chuẩn định lượng. Môn học trang bị các kiến thức cơ bản về lập mô hình và ra quyết định từ các mô hình này, về việc sử dụng các kỹ thuật cụ thể cho các áp dụng thực tế trong quản lý sản xuất & dịch vụ cũng như các lĩnh vực khác. Môn học khảo sát việc ra quyết định trong môi trường từ xác định (deterministic) đến ngẫu nhiên (stochastic), từ vấn đề đơn tiêu chuẩn (monocriterion) đến vấn đề đa tiêu chuẩn (multicriterion), từ vấn đề đa mục tiêu (MODM) đến vấn đề đa thuộc tính (MADM).

*Decision making is one of the important parts in operation research or management science. Decision making techniques help management to choose the best alternative based on quantitative criteria. This course provides students with basic knowledge about decision model formulation, so that they can make decisions based on the results of the models. This course also provides students with specific techniques for practical applications in production and services.*

### **Thiết kế mặt bằng hệ thống công nghiệp (Facility Layout)**

- Số tín chỉ: 3 (Lý thuyết: 3, Thực hành: 0)

- Điều kiện tiên quyết: không; Môn học trước: Vận trù học 1: các mô hình tất định (Deterministic Models in OR)

Mục tiêu của môn học: Môn học này sẽ giới thiệu cho sinh viên những kiến thức cơ bản về thiết kế, bố trí, và định vị trí các thiết bị công nghiệp và các thiết bị khác. Sau khi hoàn thành môn học này, sinh viên sẽ hiểu được những vấn đề chủ yếu có liên quan đến những quyết định này, phương pháp tích hợp những vấn đề này vào mô hình toán học, và phương pháp giải quyết những mô hình này để thu được sự hiểu biết sâu sắc và ra những quyết định hợp lý.

- Mô tả vấn đề nội dung: Thiết kế vị trí & Mặt bằng cung cấp sự giới thiệu toàn diện hợp lý về những phương pháp định lượng trong việc bố trí mặt bằng, tương phản với hầu hết các phương pháp định tính đang được sử dụng trong thực hành. Môn học

*cũng được thiết kế để cung cấp những công cụ và kỹ thuật cho sinh viên để giải quyết các bài toán liên quan. Ngoài ra, môn học cũng đem lại một cái nhìn bao quát và toàn diện về các bài toán đang được quan tâm trong Thiết kế vị trí và mặt bằng.*

### **Advanced Industrial Big Data Analytics (Phân tích nâng cao dữ liệu trong thương mại và công nghiệp)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học này được thiết kế để tạo ra các kỹ sư thành thạo giải quyết vấn đề và ra quyết định trong kỹ thuật hệ thống công nghiệp. Sinh viên sẽ được cung cấp một khái niệm nâng cao về hệ thống công nghiệp và sản xuất. Môn học này bao gồm các chủ đề nâng cao bao gồm tổ chức và quản lý công nghiệp nâng cao, kỹ thuật sản xuất nâng cao, lập trình NC, tạo mẫu nhanh, sản xuất tích hợp máy tính và mô phỏng.

Sinh viên sẽ được học để hiểu làm thế nào mô phỏng máy tính có thể được sử dụng như một công cụ hiệu quả để mô hình hóa và phân tích các hệ thống phức tạp. Phòng thí nghiệm sẽ chủ yếu giải quyết các khía cạnh thực tế của các lĩnh vực chính của sản xuất tiên tiến. Từ đó, sinh viên có thể giải quyết các vấn đề cơ bản trong lĩnh vực kỹ thuật hệ thống công nghiệp

*This course is designed to produce engineers specializing in problem solving and decision-making functions. Students will be provided with an advanced concept of the Industrial and manufacturing system. This course covers advanced topics including Advanced Industrial organization and management, Advanced Manufacturing engineering, NC Programming, Rapid prototyping, Computer Integrated Manufacturing, and Simulation. To understand how computer simulation can be used as an effective tool to model and analyze complex systems. The laboratory shall primarily address the practical aspects of the key areas of advanced manufacturing. The students can solve basic problems in the field of ISE*

### **Industrial Intelligent Systems (Hệ thống thông minh)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học này giới thiệu cho sinh viên về lĩnh vực Trí tuệ nhân tạo (AI), nhấn mạnh vào việc sử dụng nó để giải quyết các vấn đề trong thế giới thực mà các giải pháp khó thể hiện bằng cách sử dụng phương pháp thuật toán truyền thống. Nó khám phá lý thuyết cơ bản đằng sau các phương pháp phát triển hệ thống thể hiện hành vi thông minh bao gồm xử lý sự không chắc chắn, học hỏi kinh nghiệm và tuân theo các chiến lược giải quyết vấn đề được tìm thấy trong tự nhiên.

*This course introduces students to the field of Artificial Intelligence (AI) with emphasis on its use to solve real world problems for which solutions are difficult to*

*express using the traditional algorithmic approach. It explores the essential theory behind methodologies for developing systems that demonstrate intelligent behaviour including dealing with uncertainty, learning from experience and following problem solving strategies found in nature.*

### **Smart Manufacturing Systems (Các hệ thống sản xuất thông minh)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học này truyền đạt cho sinh viên về kiến thức thuộc sản xuất thông minh cho công nghiệp 4.0 giúp sinh viên sáng tạo trong công việc, điều hành trong lĩnh vực sản xuất.

*Impart knowledge of smart manufacturing for industry 4.0 for making student innovative*

### **Advanced Modeling & Prototyping (Mô hình hóa và tạo mẫu nâng cao)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học được thiết kế với mục tiêu giảng dạy cho sinh viên các công nghệ tạo mẫu ảo, quản lý dữ liệu sản phẩm (PDM), kỹ thuật đảo ngược (RE) và tạo mẫu nhanh (RP) và các ứng dụng của chúng trong phát triển sản phẩm.

*To teach students the virtual prototyping, product data management (PDM), reverse engineering (RE) and rapid prototyping (RP) technologies and their applications in product development.*

### **Industrial & Commercial Data Systems (Hệ thống dữ liệu trong công nghiệp & thương mại)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học này khám phá cách cơ sở dữ liệu được thiết kế, triển khai, sử dụng và duy trì, với trọng tâm là các ứng dụng công nghiệp và thương mại. Chúng tôi tập trung vào mô hình cơ sở dữ liệu quan hệ và tìm hiểu toán học của các truy vấn có cấu trúc

*This course explores how databases are designed, implemented, used and maintained, with an emphasis on industrial and commercial applications. We focus on the relational database model and learn the mathematics of structured queries*

### **Predictive Data Analytics and Applications (Phân tích dữ liệu dự đoán và ứng dụng)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học nhằm mục đích cung cấp kiến thức cho sinh viên về cách đưa ra dự đoán bằng các phương pháp kỹ thuật. Mặc dù các nhà khoa học đã quen với việc đưa ra dự đoán dựa trên các lý thuyết đã được thống nhất và chấp nhận, nhưng ngày nay, phân tích dữ liệu lớn có thể đưa ra dự đoán dựa trên việc thực hiện một chuỗi các bước xử lý dữ liệu. Môn học giải thích cả quy trình phân tích cũng như các kỹ thuật để đưa ra dự đoán. Môn học học về phân tích dự đoán rộng, đồng thời xác định một số thách thức chính phải đối mặt. Các kỹ thuật được chọn từ dự đoán dựa trên thông tin và dựa trên các lỗi, chuỗi thời gian, ANN và phương pháp nghiên cứu sâu sẽ được nghiên cứu trong môn học với các ví dụ và trường hợp cụ thể.

*The Predictive Analytics course is aimed at providing knowledge to the students on how to make prediction using machine learning techniques. While scientists are accustomed to make predictions based on consolidated and accepted theories, nowadays big data analytics is able to deliver predictions based on executing a sequence of data processing steps. The course explains both the analytics process as well as the techniques for making predictions. The course takes a broad predictive analytics project perspective, while identifying some of the key challenges faced, while making predictions. Selected techniques from the information-based and error-based prediction, time series, ANN and deep learning approaches will be studied in the course with supporting examples and use cases.*

### **Decision Analytics (Phân tích quyết định)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học nhằm mục đích giới thiệu cho sinh viên các khái niệm chính và phương pháp tiếp cận cơ bản trong phân tích định lượng và cung cấp nền tảng cho mô hình phân tích quyết định

*To introduce students to key concepts and fundamental approaches in quantitative analysis, and provide a foundation for decision-analytic modeling*

### **Industrial Process, System Data Analysis and Modelling (Hệ thống dữ liệu công nghiệp & thương mại)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Mô hình hóa dữ liệu hệ thống và quy trình là một trong những khía cạnh chính của kỹ thuật hệ thống quy trình. Đây là một hoạt động quan trọng ở hầu hết các công ty lớn trên thế giới, được thúc đẩy bởi các ứng dụng như tối ưu hóa quy trình, thiết kế và kiểm soát. Môn học trình bày một cách tiếp cận có hệ thống để mô hình hóa bao gồm xây dựng mô hình, tài liệu, phân tích, giải pháp và xác nhận. Các mô hình không chỉ phụ thuộc vào bản thân quy trình mà còn phụ thuộc vào mục tiêu của mô hình hóa. Do



đó, môn học này tập trung chủ yếu vào phân tích và mô hình hóa dữ liệu hệ thống và quy trình cho mục đích mô phỏng động và kiểm soát quy trình. Môn học này giới thiệu một phương pháp mô hình hóa có cấu trúc nhấn mạnh tầm quan trọng của mục tiêu mô hình hóa và bao gồm các bước chính như xác minh mô hình, hiệu chuẩn và xác nhận. Tập trung vào các kỹ thuật lập mô hình mới và nâng cao như mô hình hóa rời rạc, kết hợp, phân cấp và theo kinh nghiệm. Minh họa các khái niệm, công cụ và kỹ thuật mô hình hóa quy trình bằng các ví dụ và ứng dụng nâng cao.

*Industrial Process, System Data Analysis and Modelling is one of the key aspects of process systems engineering. It is a significant activity in most major companies around the world, driven by applications such as process optimization, design, and control. It presents a systematic approach to modelling covering model formulation, documentation, analysis, solution, and validation. Process models depend not only on the process itself, but also on the modelling goal. This course therefore, places its main emphasis on Industrial Process, System Data Analysis and Modelling for dynamic simulation and process control purposes. This course introduces a structured modelling methodology emphasizing the importance of the modelling goal and including key steps such as model verification, calibration, and validation. Focuses on novel and advanced modelling techniques such as discrete, hybrid, hierarchical, and empirical modelling. Illustrates the notions, tools, and techniques of process modeling with examples and advances applications.*

### **Manufacturing Processes (Quá trình sản xuất)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

### **E-Commerce Systems (Hệ thống thương mại điện tử)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Môn học trước: Principles of Logistics and Supply Chain Management, Warehouse Engineering Management
- Mô tả nội dung môn học:

Sinh viên sẽ được cung cấp đầy đủ kiến thức về lĩnh vực kinh doanh và các yếu tố công nghệ của thương mại điện tử (TMĐT). Ngoài ra, sinh viên sẽ có thể áp dụng kiến thức vào giải quyết các trường hợp thực tế.

### **Cold Chain Systems (Hệ thống chuỗi cung ứng lạnh)**

- Số tín chỉ: 3 (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: Principles of Logistics and Supply Chain Management, Warehouse Engineering Management
- Mô tả nội dung môn học:

Sinh viên sẽ được cung cấp những kiến thức và kỹ năng cơ bản khái niệm, quy trình nghiệp vụ và các mô hình/công cụ cơ bản để giải quyết các vấn đề trong các giai đoạn khác nhau của hệ thống chuỗi cung ứng lạnh.

### **Tư duy sáng tạo (Creative thinking)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học cung cấp cho sinh viên kỹ thuật cách thức để cải thiện tính linh hoạt của sinh viên. Sinh viên sẽ suy nghĩ và khám phá các phương pháp được sử dụng bởi các nhà quản lý và tổ chức để tạo ra và duy trì mức độ đổi mới cao. Các chủ đề bao gồm: sở thích tư duy cá nhân, cách thức sáng tạo, kỹ thuật tư duy sáng tạo, phương pháp lựa chọn ý tưởng, kỹ thuật hợp tác để sáng tạo, điều kiện thúc đẩy

### **Kỹ thuật hệ thống ( Systems engineering)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Kỹ thuật hệ thống là môn học các phương pháp để phát triển và phân tích các hệ thống. Môn học này cung cấp kiến thức và kỹ năng cần thiết cho các kỹ sư trong quy trình phát triển và phân tích hệ thống (sản xuất và dịch vụ): quy trình kỹ thuật hệ thống, phương pháp đánh giá, lựa chọn và tích hợp các thành phần hệ thống, mô phỏng hệ thống và đánh giá độ tin cậy, tính sẵn sàng và khả năng phục vụ của các hệ thống.

*Systems Science is the course of methods to developing and analyzing the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis (manufacturing and services): systems engineering processes, methods of evaluation, selection and integration of system components, system simulation, and assessment of reliability, availability, and serviceability of the systems.*

### **Vận chuyển Quốc tế (International transportation & logistics)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: không. Môn học trước: Vận trù học 1 – Các mô hình tất định
- Mô tả nội dung môn học:

Học sinh học về tầm quan trọng của dịch vụ logistics và vận chuyển quốc tế. Sinh viên sẽ được học các phương pháp và ứng dụng cơ bản về vận trù học để triển khai, vận hành và tối ưu hóa toàn bộ mạng lưới nguyên vật liệu của công ty các tài liệu công ty. Điều này đặc biệt được áp dụng trong việc sắp xếp tối ưu các nguồn và dòng nguyên vật liệu cũng như các mối liên kết tối ưu của chúng dưới góc nhìn của công nghệ vận chuyển. Các chủ đề gồm có: những yêu cầu cho các công ty logistics; hoạt động trong vận tải

hàng hóa đường bộ, đường sắt, hàng không và vận tải biển; cạnh tranh trong vận tải quốc tế; kế toán chi phí cho giao nhận vận tải; định giá trong vận tải hàng hóa đường bộ, đường sắt, hàng không và vận tải biển; quản lý thông tin trong giao nhận vận tải...

*Students learn the significance of international traffic and transport logistics. Student will learn basic methods and applications of operations research to implement, operate and optimize overall company material flow technical networks. This applies in particular to the subject of the optimal arrangement of sources and outflows and their dimension as well as their optimal interconnection from a transport technology point of view.*

*Topics include: requirements for logistics companies; active in road freight, rail, air and sea transport; competition in international transport; competition in international transport; cost accounting for freight forwarding; price setting in road freight, rail, air and sea transport; information management in freight forwarding...*

### **Thương mại điện tử trong Logistics và Chuỗi cung ứng (E-Logistics in Supply chain management)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học: Các nguyên lý Logistics & quản lý chuỗi cung ứng

Đào sâu nghiên cứu vai trò của thương mại điện tử trong việc tạo ra mối quan hệ hợp tác giữa các nhà vận tải và phân phối nhằm dụng tối đa nguồn lực sẵn có của các đối tác. Sự tương thích giữa công nghệ và hạ tầng vận tải, cơ cấu kiểm soát dòng vật tư và thông tin giữa bên mua và bên bán, cũng như đồng bộ hóa hệ thống giữa các bên được đặc biệt nhấn mạnh. Ngoài ra, môn học cũng cung cấp các công cụ hỗ trợ đắc lực để tạo ra giá trị trong toàn bộ chuỗi cung ứng.

*Comprehensive inquiry into the role of e-commerce in collaborative distribution and logistics relationships. Special attention is afforded to resource and technology interdependencies, exchange governance mechanisms and relationship management bench-marking. Emphasis is given to the tools for creating value in the supply chain.*

### **Hệ thống sản xuất linh hoạt (Flexible Manufacturing Systems)**

- Số tín chỉ: 3 (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết: Không

Môn học trước: CAD/CAM

Mục tiêu của môn học: Mục tiêu của môn học này là nhằm giúp sinh viên hiểu được các yếu tố của lý thuyết điều khiển cơ bản. Đặc biệt, sinh viên sẽ hiểu rõ những chủ đề sau: khái niệm về phản hồi và các đặc tính của phản hồi, khái niệm về tính ổn định và giới hạn của độ ổn định, và những công cụ khác nhau để phân tích các khái niệm đã đề cập ở trên. Môn học này cũng giúp sinh viên đạt được kiến thức về các kỹ thuật thiết kế tuyến tính cơ bản.

Mô tả vắn tắt nội dung: Môn học này cung cấp cho sinh viên sự hiểu biết sâu rộng về các hệ thống động để phân tích, dự báo, và xác định hiệu suất của một hệ thống kỹ thuật. Môn học này bao gồm: thiết kế các bộ điều khiển phản hồi cổ điển theo thời gian – bằng phương pháp Root – Locus, hoặc theo tần số, giới thiệu về điều khiển kỹ thuật số và các vấn đề thực hiện có liên quan. Thông qua các thí nghiệm, sinh viên sẽ thu được các kinh nghiệm về thiết kế các bộ điều khiển phản hồi kỹ thuật số và tương tự.

### **Kỹ năng Lãnh đạo (Leadership)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Môn học cung cấp kiến thức về phát triển tổ chức và học tập; dẫn dắt tổ chức học tập; lý thuyết lãnh đạo và các quan điểm, như phỏng theo mô hình (followership), phát triển lãnh đạo; huấn luyện và cố vấn; dẫn dắt các đội và nhóm, lãnh đạo và sự đa dạng của tổ chức.

*Organisational development and learning; leading learning organisations; leadership theories and perspectives, followership, leadership development; coaching and mentoring; leading groups and teams, leadership and diversity*

### **Quản lý bán lẻ (Retail Management)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: Các nguyên lý tiếp thị
- Mô tả nội dung môn học:

Môn học cung cấp cho sinh viên với một cái nhìn toàn diện về bán lẻ và ứng dụng của các khái niệm tiếp thị trong một môi trường quản lý bán lẻ thực tế. Như một người quản lý tiếp thị tiềm năng, môn học này sẽ cung cấp cho sinh viên cái nhìn sâu sắc vào môi trường bán lẻ mà sinh viên sẽ là một phần và cho phép sinh viên đưa ra quyết định trong sự tương tác với các nhà bán lẻ. Môn học cũng cung cấp một nền tảng tốt cho những người quan tâm đến việc sở hữu hoặc điều hành một doanh nghiệp bán lẻ nhỏ hoặc những người quan tâm theo đuổi sự nghiệp bán lẻ như một người mua hàng hóa, quản lý cửa hàng.

*This course provides the student with a comprehensive view of retailing and an application of marketing concepts in a practical retail managerial environment. As a potential marketing manager, this course will give students insight into the retailing environment of which students will be a part and allow students to make informed decisions in your interaction with retailers. The course also provides a good foundation for those interested in owning or running a small retail business or those interested in pursuing a retail career as a merchandise buyer or store manager.*

### **Khai phá dữ liệu trong chuỗi cung ứng (Data mining in Supply chain)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Khai thác dữ liệu dùng để chỉ một nhóm các kỹ thuật được sử dụng để phát hiện các mối quan hệ thú vị của dữ liệu. Với sự khả dụng của đại cơ sở dữ liệu dùng để lưu trữ, quản lý và đồng bộ hóa dữ liệu, sự đột phá mới của khai thác dữ liệu là nơi gặp gỡ của các hệ thống cơ sở dữ liệu, trí tuệ nhân tạo và các thuật toán phân tích dữ liệu có hiệu quả. Tính chất phân tán của một số cơ sở dữ liệu, kích thước và độ phức tạp cao của nhiều kỹ thuật giới thiệu những thách thức tính toán thú vị. Môn học cung cấp kiến thức tổng quan về hệ thống kinh doanh thông minh trong lĩnh vực quản lý chuỗi cung ứng và tiếp thị; Giải quyết như thế nào để tận dụng hệ thống kinh doanh thông minh để xác định tiêu chí, làm sắc nét tính chính xác của dự báo và lập kế hoạch, theo dõi hoạt động kinh doanh và cung cấp biểu đồ, bảng điểm, báo cáo chiến lược, báo cáo hoạt động và / thời gian thực để nâng cao ra quyết định cho chuỗi cung ứng và tiếp thị. SAP-giải pháp kinh doanh thông minh được giới thiệu để minh họa cho khái niệm.

*Data mining refers to a family of techniques used to detect interesting nuggets of relationships/knowledge in data. With the availability of large databases to store, manage and assimilate data, the new thrust of data mining lies at the intersection of database systems, artificial intelligence and algorithms that efficiently analyze data. The distributed nature of several databases, their size and the high complexity of many techniques present interesting computational challenges.*

*An overview of business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing. SAP business intelligence solution is introduced to illustrate the concepts store, manage and assimilate data, the new thrust of data mining lies at the intersection of database systems, artificial intelligence and algorithms that efficiently analyze data. The distributed nature of several databases, their size and the high complexity of many techniques present interesting computational challenges.*

*An overview of business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing. SAP business intelligence solution is introduced to illustrate the concepts*

### **Thực tập 1 (Internship 1)**

- Số tín chỉ: 2 tín chỉ (Lý thuyết: 2, Thực hành: 0)

- Điều kiện tiên quyết/Môn học trước: Không
- Mô tả nội dung môn học:

Khóa học này là một khóa thực tập và được thiết kế để bổ sung thêm cho phương pháp học tập theo truyền thống và thực nghiệm. Kỳ thực tập cung cấp cho sinh viên cơ hội để áp dụng thực tế kiến thức thu được trong Khoa Kỹ thuật Quản lý Công Nghiệp

Thực tập được cử đến các cơ quan, bao gồm các công ty nước ngoài, cơ quan chính phủ và các doanh nghiệp tư nhân. Sinh viên cần tối thiểu 15 ngày làm việc (5 ngày tham quan nhà máy, 5 ngày viết báo cáo, 5 ngày nhận sự chấp thuận của người giám sát).

*This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering. Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor). Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.*

### **Thực tập 2 (Internship 2)**

- Số tín chỉ: 3 tín chỉ (Lý thuyết: 3, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: không
- Mô tả nội dung môn học:

Khóa học này là một khóa thực tập và được thiết kế để bổ sung cho việc học tập trên lớp với phương pháp truyền thống và thực nghiệm. Khóa thực tập cung cấp cho sinh viên cơ hội để áp dụng thực tế kiến thức thu được ở Nhà trường.

Kỳ thực tập được thực hiện trong các công ty, ví dụ như công ty nước ngoài, cơ quan chính phủ và các ngành công nghiệp tư nhân. Sinh viên được yêu cầu tối thiểu 320 giờ làm việc hoặc 40 ngày làm việc. Các sinh viên tự sắp xếp kỳ thực tập của họ hoặc được giảng viên hướng dẫn/khoa hỗ trợ sắp xếp để hoàn thành khóa học thực tập.

*This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering. Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor). Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The*

*program coordinator can either intervene appropriately or see if the students can be transferred to a different company.*

### **Luận văn tốt nghiệp (Thesis)**

- **Số tín chỉ: 10**
- **Điều kiện tiên quyết:** Không
- **Mô tả vắn tắt nội dung:**

Luận văn tốt nghiệp là một nghiên cứu cá nhân kéo dài một học kỳ vào học kỳ cuối cùng của năm cuối. Học sinh được yêu cầu giải quyết một vấn đề quy mô lớn bằng cách thiết kế một hệ thống mới hoặc phát triển một giải pháp toàn diện để cải thiện hệ thống hiện tại. Thiết kế mới hoặc giải pháp cải tiến phải tính đến các hạn chế thực tế như điều kiện kinh tế, xã hội và môi trường.

### **Logistics và quản lý chuỗi cung ứng nâng cao (Advanced Industrial and Supply Chain Systems)**

- **Số tín chỉ: 4** (Lý thuyết: 4, Thực hành: 0)
- **Điều kiện tiên quyết:** Logistics and Supply Chain Design
- **Mục tiêu môn học:**

Sinh viên sẽ được cung cấp kiến thức nâng cao có hệ thống và kỹ năng thiết kế về vận hành hệ thống logistics và quản lý chuỗi cung ứng. Hiểu được tầm quan trọng của các quyết định trong chuỗi cung ứng đối với một tổ chức. Các quyết định tác động đến chuỗi cung ứng được đánh giá trên các chỉ số hiệu suất khác nhau. Trọng tâm nằm ở việc hiểu và áp dụng các phương pháp phân tích hiện đại, được các công ty công nghiệp, thương mại và logistics sử dụng trong thực tiễn kinh doanh.

### **Đồ án 2 (Capstone 2)**

- Số tín chỉ: 6 tín chỉ (Lý thuyết: 6, Thực hành: 0)
- Điều kiện tiên quyết/Môn học trước: Capstone 1
- Mô tả nội dung môn học:

Capstone II tiếp nối Capstone I và tập trung vào các giai đoạn nâng cao của đồ án. Môn học lấy những khái niệm ban đầu và biến chúng thành một giải pháp được hiện thực hóa đầy đủ. Capstone II mở rộng thêm đồ án bắt đầu trong Capstone I hoặc cải tiến hệ thống hiện tại, tập trung vào việc triển khai, thử nghiệm giai đoạn cuối cùng của hệ thống công nghiệp và dự án thiết kế kỹ thuật. Sinh viên sẽ xây dựng dựa trên công việc trước đây, tập trung vào ứng dụng thực tế, thách thức trong thế giới thực và tích hợp thiết kế của họ vào các hệ thống hiện có.

Trong phần kết quả, sinh viên thường trình bày các dự án đã hoàn thành của mình, bao gồm việc triển khai thực tế, kết quả kiểm tra và tài liệu.

**TRƯỞNG KHOA**



**NGUYỄN VĂN HỢP**

**KT. HIỆU TRƯỞNG  
PHÓ HIỆU TRƯỞNG**

**ĐINH ĐỨC ANH VŨ**



**PHỤ LỤC 1:**

**NỘI DUNG ĐIỀU CHỈNH CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH KỸ THUẬT  
HỆ THỐNG CÔNG NGHIỆP KHÓA 2023 SO VỚI KHÓA 2022**

*(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2023  
của Hiệu trưởng trường Đại học Quốc tế)*

**1. Các môn học loại bỏ khỏi chương trình đào tạo**

- Ngành Kỹ thuật Hệ thống Công nghiệp chia thành 3 hướng chuyên ngành: Chung (General); Intelligent Industrial Systems; Industrial analytics

<b>Hướng chuyên ngành: Chung (General)</b>	<b>Hướng chuyên ngành Intelligent Industrial Systems</b>	<b>hướng chuyên ngành Intelligent Industrial analytics</b>
<ul style="list-style-type: none"><li>- Bỏ môn Engineering Mechanics – Dynamics (IS090IU) ở học kỳ 3</li><li>- Bỏ môn Numerical methods (IS089IU)</li><li>- Bỏ môn Logistics engineering &amp; supply chain design (IS078IU)</li><li>- Bỏ môn Capstone Design (IS083IU, 3 TC)</li></ul>	<ul style="list-style-type: none"><li>- Bỏ môn Engineering Mechanics – Dynamics (IS090IU) ở học kỳ 3</li><li>- Bỏ môn Numerical methods (IS089IU) ở học kỳ 5</li><li>- Bỏ môn Logistics engineering &amp; supply chain design (IS078IU)</li><li>- Bỏ môn Experimental Design (IS031IU) khỏi nhóm tự chọn số 1</li><li>- Bỏ Capstone Design (IS083IU, 3 TC) ở học kỳ 7</li><li>- Bỏ môn Multi-Criteria Decision Making (IS033IU)</li><li>- Bỏ môn Facility Layout (IS032IU)</li></ul>	<ul style="list-style-type: none"><li>- Bỏ môn Engineering Mechanics – Dynamics (IS090IU) ở học kỳ 3</li><li>- Bỏ môn Probabilistic Models in OR (IS024IU) ở học kỳ 5</li><li>- Bỏ môn Numerical methods (IS089IU) ở học kỳ 5</li><li>- Bỏ môn Logistics engineering &amp; supply chain design (IS078IU)</li><li>- Bỏ môn Experimental Design (IS031IU) khỏi nhóm tự chọn số 1</li><li>- Bỏ môn Capstone Design (IS083IU, 3 TC)</li><li>- Bỏ môn Multi-Criteria Decision Making (IS033IU)</li><li>- Bỏ môn Facility Layout (IS032IU)</li></ul>

**2. Các môn học bổ sung chương trình đào tạo**

<b>Hướng chuyên ngành: Chung (General)</b>	<b>Hướng chuyên ngành Intelligent Industrial Systems</b>	<b>hướng chuyên ngành Intelligent Industrial analytics</b>
<ul style="list-style-type: none"> <li>- Thêm môn pháp luật đại cương (PE021IU) là môn bắt buộc học kỳ 3</li> <li>- Thêm môn Data Collection, Analysis and Applications (IS092IU) là môn bắt buộc học kỳ 5</li> <li>- Thêm môn E-Commerce Systems (IS106IU, 3TC) là môn tự chọn nhóm 1 ở HK 5</li> <li>- Thêm môn Cold Chain Systens (IS105IU, 3TC) là môn tự chọn nhóm 1 ở học kỳ 5</li> <li>- Thêm môn Capstone 1 (IS111IU, 3TC) là môn bắt buộc ở học kỳ 7</li> <li>- Thêm môn Data Mining In Supply Chain (IS066IU) là môn tự chọn nhóm số 2 ở học kỳ 7</li> <li>- Thêm môn Advanced Industrial and Supply Chain Systems (IS094IU, 6 TC) ở học kỳ 8</li> <li>- Thêm môn Capstone 2 (IS108IU, 6 TC) ở học kỳ 8</li> </ul>	<ul style="list-style-type: none"> <li>- Thêm môn pháp luật đại cương (PE021IU) là môn học kỳ 3</li> <li>- Thêm môn Data Collection, Analysis and Applications (IS092IU) là môn bắt buộc học kỳ 5</li> <li>- Thêm môn E-Commerce Systems (IS106IU, 3TC) là môn tự chọn nhóm 1 ở HK 5</li> <li>- Thêm môn Cold Chain Systens (IS105IU, 3TC) là môn tự chọn nhóm 1 ở học kỳ 5</li> <li>- Thêm môn Industrial Intelligent Systems (IS095IU) là môn bắt buộc học kỳ 6</li> <li>- Thêm môn Advanced Industrial Big Data Analytics (IS096IU) là môn bắt buộc học kỳ 6</li> <li>- Thêm môn Capstone 1 (IS111IU, 3TC) là môn bắt buộc ở học kỳ 7</li> <li>- Thêm môn Smart Manufacturing Systems (IS097IU, 3 TC) là môn bắt buộc học kỳ 7</li> <li>- Thêm môn Advanced Modeling &amp; Prototyping (IS098IU, 3 TC) là môn bắt buộc học kỳ 7</li> <li>- Thêm môn Data Mining In Supply Chain (IS066IU) là môn tự chọn nhóm số 2 ở học kỳ 7</li> <li>- Thêm môn Advanced Industrial and Supply Chain Systems (IS094IU, 6 TC) ở học kỳ 8</li> </ul>	<ul style="list-style-type: none"> <li>- Thêm môn pháp luật đại cương (PE021IU) là môn học kỳ 3</li> <li>- Thêm môn Data Collection, Analysis and Applications (IS092IU) là môn bắt buộc học kỳ 5</li> <li>- Thêm môn E-Commerce Systems (IS106IU, 3TC) là môn tự chọn nhóm 1 ở HK 5</li> <li>- Thêm môn Cold Chain Systens (IS105IU, 3TC) là môn tự chọn nhóm 1 ở học kỳ 5</li> <li>- Thêm môn Data Mining In Supply Chain (IS066IU) là môn tự chọn nhóm số 2</li> <li>- Thêm môn Predictive Data Analysis and Applications (IS093IU, 3 TC) là môn bắt buộc học kỳ 6</li> <li>- Thêm môn Industrial &amp; Commercial Data Systems (IS099IU, 3 TC) là môn bắt buộc học kỳ 6</li> <li>- Thêm môn Capstone 1 (IS111IU, 3TC) là môn bắt buộc ở học kỳ 7</li> <li>- Thêm môn Decision Analytics (IS100IU, 3 TC) là môn bắt buộc học kỳ 7</li> <li>- Thêm môn Industrial Process, System Data Analysis and Modelling (IS101IU, 3 TC) là môn bắt buộc học kỳ 7</li> </ul>

	- Thêm môn Capstone 2 (IS108IU, 6 TC) ở học kỳ 8	- Thêm môn Advanced Industrial and Supply Chain Systems (IS094IU, 6 TC) ở học kỳ 8 - Thêm môn Capstone 2 (IS108IU, 6 TC) ở học kỳ 8
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### 3. Các điều chỉnh khác

<b>Hướng chuyên ngành: Chung (General)</b>	<b>Hướng chuyên ngành Intelligent Industrial Systems</b>	<b>hướng chuyên ngành Intelligent Industrial analytics</b>
- Chuyển môn CAD/CAM/CNC (IS085IU) từ học kỳ 4 sang học kỳ 5	- Chuyển môn CAD/CAM/CNC (IS085IU) từ học kỳ 4 sang học kỳ 5	- Chuyển môn CAD/CAM/CNC (IS085IU) từ học kỳ 4 sang học kỳ 5 -
- Chuyển môn Inventory Management (IS023IU) từ môn tự chọn nhóm 2 sang môn bắt buộc học kỳ 5	- Chuyển môn Inventory Management (IS023IU) từ môn tự chọn nhóm 2 sang môn bắt buộc học kỳ 5	- Chuyển môn Inventory Management (IS023IU) từ môn tự chọn nhóm 2 sang môn bắt buộc học kỳ 5
- Chuyển môn Project Management (IS026IU) từ học kỳ 5 sang học kỳ 4	- Chuyển môn Project Management (IS026IU) từ học kỳ 5 sang học kỳ 4	- Chuyển môn Project Management (IS026IU) từ học kỳ 5 sang học kỳ 4
- Chuyển môn Environmental Science (PE014IU) từ môn bắt buộc thành môn tự chọn nhóm số 3 - Chuyển môn Ethnics and professional skills for engineers từ bắt buộc học kỳ 6 sang tự chọn nhóm 3 ở học kỳ 7	- Chuyển môn Environmental Science (PE014IU) từ môn bắt buộc thành môn tự chọn nhóm số 3 - Chuyển môn Ethnics and professional skills for engineers từ bắt buộc học kỳ 6 sang tự chọn nhóm 3 ở học kỳ 7	- Chuyển môn Environmental Science (PE014IU) từ môn bắt buộc thành môn tự chọn nhóm số 3 - Chuyển môn Ethnics and professional skills for engineers từ bắt buộc học kỳ 6 sang tự chọn nhóm 3 ở học kỳ 7
- Chuyển môn Time series & forecasting techniques (IS058IU) từ môn tự chọn nhóm số 1 thành môn bắt buộc ở học kỳ 5	- Chuyển môn Time series & forecasting techniques (IS058IU) từ môn tự chọn nhóm số 1 thành môn bắt buộc ở học kỳ 5	- Chuyển môn Time series & forecasting techniques (IS058IU) từ môn tự chọn nhóm số 1 thành môn bắt buộc ở học kỳ 5
- Chuyển môn Experimental Design (IS031IU) từ môn tự		

chọn nhóm số 1 thành môn bắt buộc ở học kỳ 6		
- Chuyển môn Probabilistic Models in OR (IS024IU) từ học kỳ 5 sang học kỳ 6		
<ul style="list-style-type: none"> <li>- Giảm môn Engineering Drawing (IS054IU) từ 3 tín chỉ còn 2 tín chỉ → mã mới IS102IU</li> <li>- Giảm môn Time series &amp; forecasting techniques (IS058IU) từ 3 tín chỉ còn 2 tín chỉ → Mã mới IS104IU</li> <li>- Giảm môn Deterministic models in OR (IS081IU) từ 4 tín chỉ còn 3 tín chỉ → Mã mới IS103IU</li> </ul>	<ul style="list-style-type: none"> <li>- Giảm môn Engineering Drawing (IS054IU) từ 3 tín chỉ còn 2 tín chỉ → mã mới IS102IU</li> <li>- Giảm môn Time series &amp; forecasting techniques (IS058IU) từ 3 tín chỉ còn 2 tín chỉ → Mã mới IS104IU</li> <li>- Giảm môn Deterministic models in OR (IS081IU) từ 4 tín chỉ còn 3 tín chỉ → Mã mới IS103IU</li> </ul>	<ul style="list-style-type: none"> <li>- Giảm môn Engineering Drawing (IS054IU) từ 3 tín chỉ còn 2 tín chỉ → mã mới IS102IU</li> <li>- Giảm môn Time series &amp; forecasting techniques (IS058IU) từ 3 tín chỉ còn 2 tín chỉ → Mã mới IS104IU</li> <li>- Giảm môn Deterministic models in OR (IS081IU) từ 4 tín chỉ còn 3 tín chỉ → Mã mới IS103IU</li> </ul>
<p>Đối với Đề án tốt nghiệp của sinh viên:</p> <ul style="list-style-type: none"> <li>- Đối với sinh viên có GPA &gt; 70 (loại khá trở lên): làm luận văn</li> <li>- Đối với sinh viên có GPA ≤ 70: sinh viên học 2 môn: <ul style="list-style-type: none"> <li>• Advanced Industrial and Supply Chain Systems (IS094IU, 6 TC)</li> <li>• Capstone 2 (IS108IU, 6 TC)</li> </ul> </li> </ul>	<p>Đối với Đề án tốt nghiệp của sinh viên:</p> <ul style="list-style-type: none"> <li>- Đối với sinh viên có GPA &gt; 70 (loại khá trở lên): làm luận văn</li> <li>- Đối với sinh viên có GPA ≤ 70: sinh viên học 2 môn <ul style="list-style-type: none"> <li>• Advanced Industrial and Manufacturing Systems (IS094IU)</li> <li>• Capstone 2 (IS108IU, 6 TC)</li> </ul> </li> </ul>	<p>Đối với Đề án tốt nghiệp của sinh viên:</p> <ul style="list-style-type: none"> <li>- Đối với sinh viên có GPA &gt; 70 (loại khá trở lên): làm luận văn</li> <li>- Đối với sinh viên có GPA ≤ 70: sinh viên học 2 môn <ul style="list-style-type: none"> <li>• Advanced Industrial and Manufacturing Systems (IS094IU)</li> <li>• Capstone 2 (IS108IU, 6 TC)</li> </ul> </li> </ul>

#### 4. Hướng xử lý cho các sinh viên khóa cũ khi chưa học các môn học bị loại bỏ khỏi chương trình đào tạo

- **Đối với những môn bị loại bỏ khỏi chương trình đào tạo:** Mở thêm 2 lần đối với các môn cũ cho sinh viên khóa cũ học. Sau khi mở 2 lần, nếu vẫn còn sinh viên rớt, Khoa sẽ đề xuất tìm môn mới để xét tương đương các môn cũ.

- **Đối với những môn bị giảm tín chỉ:** đề xuất với Phòng Đào tạo mở thêm 1 môn mới (1TC, mã mới) + môn mới (3TC, mã mới) tương đương với môn cũ (4 TC, mã cũ).

- Ví dụ: môn OR1 giảm từ 4 tín chỉ xuống còn 3 tín chỉ:

- OR1 cũ (4TC) = OR1 mới (3TC) + 1 mã môn mới tạo ra (1TC)

- Sinh viên của khóa cũ sau khi học xong môn OR1 mới (3TC), sẽ tham gia học thêm 1 tiết của mã môn mới (1TC) để hoàn thành 4 TC của môn cũ.

ĐẠI HỌC QUỐC GIA  
THÀNH PHỐ HỒ CHÍ MINH  
TRƯỜNG ĐẠI HỌC QUỐC TẾ

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM  
Độc lập – Tự do – Hạnh phúc

**PHỤ LỤC 2:**

**ĐỀ CƯƠNG CHI TIẾT CÁC MÔN HỌC**

(Sắp xếp đúng thứ tự môn học Bảng 9 – Nội dung CTĐT)

(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2023  
của Hiệu trưởng trường Đại học Quốc tế)

## ĐỀ CƯƠNG CHI TIẾT MÔN HỌC

### Triết học Mác-Lênin (Philosophy Marx - Lenin)

#### 1. Thông tin chung

Tên môn học (tiếng Việt):	Triết học Mác-Lênin
Tên môn học (tiếng Anh):	Philosophy Marx – Lenin
Mã số môn học:	PE015IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	3
<i>Số tiết lý thuyết:</i>	<i>30 (trên lớp)</i>
<i>Số tiết thực hành:</i>	<i>15 (trên lớp)</i>
<i>Số tiết tự học:</i>	<i>90 (về nhà)</i>
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

#### 2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

- 2.1. Môn học trang bị cho sinh viên những nội dung cơ bản về thế giới quan, phương pháp luận triết học Mác - Lênin.
- 2.2. Giúp cho sinh viên vận dụng những tri thức về thế giới quan, phương pháp luận triết học triết học Mác - Lênin một cách sáng tạo trong hoạt động nhận thức và thực tiễn, nhằm giải quyết những vấn đề mà đời sống xã hội của đất nước, của thời đại đang đặt ra.

#### 3. Mô tả môn học (Course Outlines)

Môn học trang bị cho sinh viên những kiến thức cơ bản về triết học Mác-Lênin

#### 4. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Giáo trình Triết học Mác - Lênin*, Nxb. Chính trị quốc gia, Hà Nội.

- Bộ Giáo dục và Đào tạo (2012), *Giáo trình Những Nguyên lý cơ bản của chủ nghĩa Mác - Lênin*, Nxb. Chính trị quốc gia, Hà Nội.

- Hội đồng Trung ương (2008), *Giáo trình Triết học Mác-Lênin*, Nxb. Chính trị quốc gia, Hà Nội.

### 5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
<b>5.1. Kiến thức</b>					
LO.1	TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI	<p>LO. 1.1 - Khái lược được triết học, một số khái niệm cơ bản trong triết học</p> <p>LO. 1.2 - Nhận biết được sự đối lập giữa chủ nghĩa duy vật và chủ nghĩa duy tâm trong việc giải quyết vấn đề cơ bản của triết học</p> <p>LO. 1.3 - Nắm được chủ nghĩa duy vật biện chứng - hình thức phát triển cao nhất của chủ nghĩa duy vật biện chứng</p> <p>LO. 1.4 - Nắm rõ được sự ra đời, đối tượng, chức năng và vai trò của triết học Mác - Lênin</p>	2.1	1.1.3	I3
LO.2	CHỦ NGHĨA DUY VẬT BIỆN CHỨNG	<p>LO.2.1- Hiểu rõ vật chất theo quan điểm của chủ nghĩa duy vật biện chứng</p> <p>LO.2.2 - Hiểu rõ ý thức theo quan điểm của chủ nghĩa duy vật biện chứng</p> <p>LO.2.3 - Giải quyết được mối quan hệ giữa vật chất và ý thức theo quan điểm của chủ nghĩa duy vật biện chứng</p> <p>LO.2.4 - Hiểu được phép biện chứng và phép biện chứng duy vật</p>	2.1 2.1 2.1 2.1	1.1.3	T4

		LO.2.5 - Hiểu rõ được hai nguyên lý cơ bản của phép biện chứng duy vật và rút ra ý nghĩa phương pháp luận của từng nguyên lý	2.1 2.2		
		LO.2.6 - Hiểu rõ được các cặp phạm trù cơ bản của phép biện chứng duy vật và rút ra ý nghĩa phương pháp luận từng cặp phạm trù	2.1 2.2		
		LO.2.7 - Hiểu rõ được các quy luật cơ bản của cơ bản của phép biện chứng duy vật và rút ra ý nghĩa phương pháp luận từng quy luật	2.1 2.2		T4
		LO.2.8 - Hiểu rõ được thực tiễn, nhận thức, vai trò của thực tiễn đối với nhận thức và chân lý	2.1		
LO.3	CHỦ NGHĨA DUY VẬT LỊCH SỬ	LO.3.1 - Nắm được vai trò của sản xuất vật chất và phương thức sản xuất đối với sự tồn tại và phát triển xã hội			
		LO.3.2 - Hiểu rõ được mối quan hệ biện chứng giữa lực lượng sản xuất và quan hệ sản xuất			
		LO.3.3 - Hiểu rõ được mối quan hệ biện chứng giữa CSHT và KTTT; sự phát triển tự nhiên của các hình thái KT-XH	2.1 2.2	1.1.3	T4
		LO.3.4 - Hiểu rõ được giai cấp, đấu tranh giai cấp; dân tộc và mối quan hệ giữa giai cấp, dân tộc và nhân loại			
		LO.3.5 - Hiểu rõ được nhà nước và mạng xã hội			
		LO.3.6 - Hiểu rõ được mối quan hệ biện chứng giữa tồn tại xã hội và ý thức xã hội			
		LO.3.7 - Hiểu rõ được con người bản chất con người; hiện tượng tha hóa và giải phóng con người mối quan hệ giữa cá nhân và xã hội, vai trò của quần chúng nhân dân			



LO.4	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.4.1. Có kỹ năng khái quát hóa để rút ra <i>Từ khóa tri thức</i> đối với mỗi nội dung và tư duy có hệ thống LO.4.2. Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn LO.4.3. Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc	2.1 2.2	2.1.1 2.3.1  2.4.4  2.5 3.1.5	U4
<b>5.3. Thái độ</b>					
LO.5	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	LO.5.1. Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng, nhân văn của CN Mác - Lênin LO.5.2. Có ý thức, trách nhiệm cá nhân đối với tập thể, cộng đồng LO.5.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong cuộc sống.	2.1 2.2	3.1	U3

<b>5.2. Kỹ năng</b>
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**6. Kế hoạch giảng dạy theo buổi học (Course Plan):**

TT (Tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1 (1 tiết)	<b>Giới thiệu về môn học</b>	LO.1, LO.4;	<p><b>Dạy:</b></p> <ul style="list-style-type: none"> <li>- Giới thiệu đề cương môn học</li> <li>- Giới thiệu nội dung đề tài thuyết trình nhóm GHW)</li> </ul> <p><b>Học ở lớp:</b></p> <ul style="list-style-type: none"> <li>- Chia nhóm (5 sv/nhóm)</li> <li>- Giới thiệu nhóm học tập</li> </ul> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Chọn đề tài thuyết trình của nhóm (GHW)</li> </ul> <p>Đọc trước tài liệu chương 1.</p>	
2 (15 tiết)	<b>Chương 1 TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI</b>	LO.1; LO.4 LO.5	<p><b>Dạy:</b></p> <p><b>I. TRIẾT HỌC VÀ VẤN ĐỀ CƠ BẢN CỦA TRIẾT HỌC</b></p> <ol style="list-style-type: none"> <li>1. Khái lược về triết học</li> <li>2. Vấn đề cơ bản của triết học</li> <li>3. Biện chứng và siêu hình</li> </ol> <p><b>II. TRIẾT HỌC MÁC - LÊNIN VÀ VAI TRÒ CỦA TRIẾT HỌC MÁC - LÊNIN TRONG ĐỜI SỐNG XÃ HỘI</b></p> <ol style="list-style-type: none"> <li>1. Sự ra đời và phát triển của triết học Mác - Lênin</li> <li>2. Đối tượng và chức năng của triết học Mác - Lênin</li> <li>3. Vai trò của triết học Mác - Lênin trong đời sống xã hội và trong sự nghiệp đổi mới ở Việt Nam hiện nay</li> </ol> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Phác thảo nội dung thuyết trình nhóm GHW</li> </ul> <p>Đọc trước tài liệu chương 2.</p>	Thi giữa kỳ (Quiz)
3 (15 tiết)	<b>Chương 2 CHỦ NGHĨA DUY VẬT BIỆN CHỨNG</b>	LO.2 LO.4 LO.5	<p><b>Dạy:</b></p> <p><b>I. VẬT CHẤT VÀ Ý THỨC</b></p> <ol style="list-style-type: none"> <li>1. Vật chất và các hình thức tồn tại của vật chất</li> <li>2. Nguồn gốc, bản chất và kết cấu của ý thức</li> <li>3. Mối quan hệ giữa vật chất và ý thức</li> </ol> <p><b>II. PHÉP BIỆN CHỨNG DUY VẬT</b></p> <ol style="list-style-type: none"> <li>1. Hai loại hình biện chứng và phép biện chứng duy vật</li> </ol> <p>Nội dung của phép biện chứng duy vật</p> <p><b>III. LÝ LUẬN NHẬN THỨC</b></p> <ol style="list-style-type: none"> <li>1. Các nguyên tắc của lý luận nhận thức duy vật biện chứng</li> <li>2. Nguồn gốc, bản chất của nhận thức</li> <li>3. Thực tiễn và vai trò của thực tiễn đối với nhận thức</li> <li>4. Các giai đoạn cơ bản của quá trình nhận thức</li> </ol>	Thi giữa kỳ (Quiz)  Thi cuối kỳ (FEX)

			<p>Chân lý</p> <p><b>Học ở Lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p> <p>Đọc trước tài liệu chương 3</p>	
4 (14 tiết)	<p><b>Chương 3 CHỦ NGHĨA DUY VẬT LỊCH SỬ</b></p>	<p>L0.3</p> <p>L0.4</p> <p>L0.5</p>	<p><b>Dạy:</b></p> <p><b>I. HỌC THUYẾT HÌNH THÁI KINH TẾ - XÃ HỘI</b></p> <p>1. Sản xuất vật chất là cơ sở của sự tồn tại và phát triển xã hội</p> <p>2. Biện chứng giữa lực lượng sản xuất và quan hệ sản xuất</p> <p>3. Biện chứng giữa cơ sở hạ tầng và kiến trúc thượng tầng của xã hội</p> <p>4. Sự phát triển các hình thái kinh tế - xã hội là một quá trình lịch sử - tự nhiên</p> <p><b>II. GIAI CẤP VÀ DÂN TỘC 160</b></p> <p>1. Vấn đề giai cấp và đấu tranh giai cấp</p> <p>2. Dân tộc</p> <p>3. Mối quan hệ giai cấp - dân tộc - nhân loại</p> <p><b>III. NHÀ NƯỚC VÀ CÁCH MẠNG XÃ HỘI</b></p> <p>1. Nhà nước</p> <p>2. Cách mạng xã hội</p> <p><b>IV. Ý THỨC XÃ HỘI</b></p> <p>1. Khái niệm tồn tại xã hội và các yếu tố cơ bản của tồn tại xã hội</p> <p>2. Ý thức xã hội và kết cấu của ý thức xã hội</p> <p><b>V. TRIẾT HỌC VỀ CON NGƯỜI</b></p> <p>1. Khái niệm con người và bản chất con người</p> <p>2. Hiện tượng tha hóa con người và vấn đề giải phóng con người</p> <p>3. Quan hệ cá nhân và xã hội; vai trò của quần chúng nhân dân và lãnh tụ trong lịch sử</p> <p>Vấn đề con người trong sự nghiệp cách mạng ở Việt Nam</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Hoàn thiện bài thuyết trình</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>

### 7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	15%	Thuyết trình và bản báo cáo nhóm	LO.2 LO.3 LO.4 LO.5
2	Quiz	Bài thi giữa kỳ	Thi theo đề thi chung	20%	Tự luận đề mở	LO.1 LO.2;
3	Die	Thảo luận, chuyên cần tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. sv có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.4 LO.5
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận đề đóng	LO.2; LO.3; LO.4;
			<b>Tổng cộng</b>	<b>100%</b>		

### 8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết được sự đối lập giữa chủ nghĩa duy vật và chủ nghĩa duy tâm trong việc giải quyết vấn đề cơ bản của triết học; vai trò của triết học Mác – Lênin	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2 LO.4	Nắm rõ nội dung: Vật chất, ý thức và mối quan hệ giữa chúng; các nguyên lý, các quy luật và các phạm trù cơ bản của phép biện chứng duy vật	Chương 2	Thuyết trình nhóm (GHW)  Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm  Ngân hàng đề thi của GV
LO.3 LO.4	Nhận biết và nắm được nội dung của chủ nghĩa duy vật lịch sử	Chương 3	Thảo luận tại lớp (Discussion in Class)  Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp  Ngân hàng đề thi của GV

**9. Một số lưu ý khác:**

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn

- Quy định về Bài thuyết trình nhóm GHW

Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2 hoặc trực tiếp nộp cho GV buổi 1.

Tuần 4 (buổi thứ 4) thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình.

Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV

- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị cấm thi theo quy chế. Có đầy đủ điểm kiểm tra, điểm thi kết thúc học phần & nhiệt tình thảo luận, phát biểu xây dựng bài, nghiêm túc trong giờ học.

*TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2020*

**KT. TRƯỞNG KHOA  
PHÓ TRƯỞNG KHOA**



**TS. Nguyễn Đình Quốc Cường**

## **ĐỀ CƯƠNG CHI TIẾT MÔN HỌC**

### **Kinh tế chính trị Mác-Lênin**

(Marxist-Leninist Political Economy)

#### **1. Thông tin chung**

Tên môn học (tiếng Việt):	Kinh tế chính trị Mác-Lênin
Tên môn học (tiếng Anh):	Marxist – Leninist Political Economy
Mã số môn học:	PE016IU
Thuộc tính khối kiến thức:	Cơ sở
Số tín chỉ:	2
	<i>Số tiết lý thuyết: 20 (trên lớp)</i>
	<i>Số tiết thực hành: 10 (trên lớp)</i>
	<i>Số tiết tự học: 60 (về nhà)</i>
Môn học song hành:	1. Triết học Mác - Lênin
Giảng viên phụ trách:	Khoa Chính trị - Hành chính. ĐHQG-HCM

#### **2. Mục đích/mục tiêu môn học (Course Purposes/Aims)**

- 2.1. Một là, trang bị cho sinh viên những kiến thức cơ bản, cốt lõi của Kinh tế chính trị Mác – Lênin trong bối cảnh phát triển kinh tế của đất nước và thế giới ngày nay. Bảo đảm tính cơ bản, hệ thống, khoa học, cập nhật tri thức mới, gần với thực tiễn. tính sáng tạo, kỹ năng, tư duy, sản phẩm chất người học, tính liên thông khắc phục trùng lặp, tăng cường tích hợp và giảm tái sinh, lược bớt những nội dung không còn phù hợp hoặc những nội dung mang tính kinh viện đối kháng sinh viên các trường Cao đẳng, Đại học không chuyên luận.
- 2.2. Hai là, trên cơ sở đó hình thành tư duy, kỹ năng phân tích, đánh giá và nhận diện bản chất của các quan hệ có lợi cho kinh tế trong phát triển kinh tế - xã hội của đất nước góp phần giúp sinh viên xây dựng trách nhiệm xã hội phù hợp với vị trí công việc và cuộc sống sau khi ra trường.
- 2.3. Ba là, góp phần xây dựng trường, thức hệ tư tưởng Mác – Lê nin đối với sinh viên.

#### **3. Mô tả môn học (Đề cương khóa học)**

Nội dung chương trình gồm 6 chương: Trong đó chương 1 bàn về đối tượng, phương pháp nghiên cứu và chức năng của Kinh tế chính trị Mác – Lênin. Từ chương 2 đến chương 6 trình bày nội dung cốt lõi của Kinh tế chính trị Mác – Lê nin theo mục tiêu của môn học. Cụ thể các vấn đề như: Hàng hóa, thị trường và vai trò của các chủ sở hữu nền kinh tế thị trường; Sản xuất giá trị thặng dư trong nền kinh tế thị trường; trong Cạnh tranh và độc quyền trong nền kinh tế thị trường; Kinh tế thị trường định hướng xã hội chủ nghĩa và các quan hệ có lợi cho kinh tế ở Việt Nam; Công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế tại Việt Nam.

#### 4. Tài liệu phục vụ học tập:

- Tài liệu bắt buộc: Giáo trình kinh tế chính trị Mác – Lê nin dành cho bậc đại học không chuyên kinh tế chính trị.

- Tài liệu đọc thêm:

+ Robert, JR và Robert F. Hebert (2003), Lịch sử các học thuyết kinh tế, Bản tiếng Việt, Nxb Thống kê.

+ Viện Kinh tế chính trị, Học viện Chính trị quốc gia Hồ Chí Minh (2018), Giáo trình Kinh tế chính trị Mác – Lê nin, NXB Lý luận Chính trị.

+ Các. Mác – Ph. Ănggen: Toàn tập, tập 20, tập 23, tập 25, Nxb Chính trị quốc gia, 1994.

+ V.I.Lê nin toàn tập, tập 3, tập 27. NXB Tiến bộ Maxcova, 1976.

+ Davig Begg, Stanley Fisher, Rudiger Dornbusch, Kinh tế học, Nhà xuất dục Hà Nội 1992.

+ Đảng Cộng sản Việt Nam (2016), Văn kiện Đại hội Đại biểu toàn quốc lần thứ XII, Nxb Chính trị quốc gia, Hà Nội.

+ Đảng Cộng sản Việt Nam (2016), Báo cáo tổng kết một số vấn đề lý luận – thực tiễn qua ba mươi năm đổi mới (1986 – 2016), NXB Chính trị quốc gia, Hà Nội.

+ Đảng Cộng sản Việt Nam (2017), Nghị quyết số 11-NQ/TW ngày 03/6/2017 về: “Hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa”

+ Chỉ thị số 16/CT-TTg (2017) “Về việc tăng cường năng lực cạnh kể cuộc cách mạng công nghiệp lần thứ 4”.

+ Jeremy Rifkin (2014), Cuộc cách mạng công nghiệp lần thứ ba, bản dịch tiếng Việt, NXB Lao động xã hội.

+ Manfred B. Steger (2011), Toàn cầu hóa, Nxb Tri thức.

+ Klaus Schwab (2015): Caahcs mạng công nghiệp lần thứ 4, Nxb Chính trị quốc gia.

+ Sự thật, 2018.

#### 5. Chuẩn đầu ra môn học (Course Learnig Outcomes).

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIP CTDT	Mức độ giảng dạy (I/T/U)
5.1.Kiến thức					
LO.1	ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ	LO.1.1-Nắm được sự hình thành và phát triển của Kin tế chính trị Mác-Lênin. LO.1.2- Xác định được đối tượng nghiên của kinh tế chính trị Mác-Lênin.	2.1		I3

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIP CTDT	Mức độ giảng dạy (I/T/U)
	MÁC-LÊNIN	LO.1.3- Hiểu rõ được phương pháp nghiên cứu của kinh tế chính trị Mác-Lênin LO.1.4- Hiểu rõ các chức năng của môn học kinh tế chính trị Mác-Lenin.			
LO.2	HÀNG HÓA, THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỂ THAM GIA THỊ TRƯỜNG	LO.2.1- Hiểu rõ sản xuất hàng hóa và điều kiện ra đời của sản xuất hàng hóa. LO.2.2- Hiểu rõ hàng hóa, hai thuộc tính của hàng hóa và mối quan hệ giữa hai thuộc tính . LO.2.3- Hiểu rõ mối quan hệ giữa tính hai mặt của lao động sản xuất hàng hóa với hai thuộc tính của hàng hóa LO.2.4- Hiểu rõ mặt chất và lượng của giá trị hàng hóa và các nhân tố ảnh hưởng đến giá trị hàng hóa . LO.2.5- Hiểu rõ được nguồn gốc, bản chất và chức năng của tiền tệ. LO.2.6- Hiểu rõ về thị trường , vai trò của thị trường, cơ chế thị trường và nền kinh tế thị trường. LO.2.7- Hiểu rõ được một số quy luật kinh tế chủ yếu của kinh tế thị trường. LO.2.8- Hiểu rõ vai trò của các chủ thể tham gia thị trường.	2.1		T4
LO.3	GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.3.1- Hiểu rõ được tư bản là gì, công thức chung của tư bản và mâu thuẫn công thức chung của tư bản. LO.3.2- Hiểu rõ được hàng hóa sức lao động là gì, tại sao nghiên cứu hàng hóa sức lao động giải quyết mâu thuẫn công thức chung của tư bản. LO.3.3- Hiểu rõ được giá trị thặng dư là gì. Xác định được có mấy phương pháp sản xuất giá trị thặng dư.	2.1 2.1 2.1 2.3		T4



Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIP CTDT	Mức độ giảng dạy (I/T/U)
		LO.3.4-Hiểu rõ được bản chất của tích lũy tư bản, nhưng nhân tố làm tăng quy mô quy mô tích lũy tư bản và hệ quả của tích lũy tư bản.	2.3		
		LO.3.5-Hiểu rõ được các khái niệm: chi phí sản xuất, lợi nhuận, tỷ suất lợi nhuận, lợi nhuận bình quân, lợi nhuận thương nghiệp, các nhân tố ảnh hưởng đến tỷ suất lợi nhuận.	2.1		
		LO.3.6-Hiểu rõ được lợi tức là gì	2.1		
		LO.3.7-Hiểu rõ được địa tô tư bản chủ nghĩa. Có mấy loại địa tô tư bản chủ nghĩa và giá cả ruộng đất.	2.1 2.3		
LO.4	CẠNH TRANH VÀI ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.4.1- Hiểu rõ được quan hệ cạnh tranh và độc quyền trong nền kinh tế thị trường.	2.1		
		LO.4.2 - Hiểu rõ được nguyên nhân hình thành độc quyền trong nền kinh tế thị trường.	2.1		
		LO.4.3 - Hiểu rõ được những đặc điểm kinh tế cơ bản của độc quyền trong chủ nghĩa tư bản theo quan điểm của V.I. Lênin	2.1		
		LO.4.4 - Hiểu rõ được nguyên nhân hình thành và phát triển của chủ nghĩa tư bản độc quyền nhà nước.	2.1		
		LO.4.5 - Hiểu rõ được bản chất của chủ nghĩa tư bản độc quyền nhà nước và những biểu hiện chủ yếu của độc quyền nhà nước trong chủ nghĩa tư bản.	2.3		
		LO 4.6 – Nắm được vai trò lịch sử của chủ nghĩa tư bản.	2.1		
LO.5	KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM	LO.5.1 - Hiểu rõ được khái niệm kinh tế thị trường định hướng xã hội chủ nghĩa.	2.1		
		LO.5.2 – Hiểu rõ được tính tất yếu khách quan của việc phát triển kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam	2.1		
		LO.5.3 – Nắm được những đặc trưng của kinh tế thị trường định	2.1		

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIP CTDT	Mức độ giảng dạy (I/T/U)
		hướng xã hội chủ nghĩa ở Việt Nam.	2.1		
		LO.5.4 – Hiểu rõ thể chế kinh tế thị trường định hướng xã hội chủ nghĩa là gì và sự cần thiết phải hoàn thiện nó.	2.1		
		LO.5.5 – Nắm được những nội dung cơ bản của hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa là gì và sự cần thiết phải hoàn thiện nó.	2.2		
		LO.5.6 – Hiểu rõ được khái niệm lợi ích kinh tế và quan hệ lợi ích kinh tế.	2.1		
		LO.5.7 - Hiểu rõ được khái niệm lợi ích kinh tế và quan hệ lợi ích kinh tế			
LO.6	CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP KINH TẾ QUỐC TẾ CỦA VIỆT NAM	LO.6.1 - Hiểu rõ được cách mạng công nghiệp là gì, khái quát được các cuộc cách mạng đã diễn ra trong lịch sử.	2.1		
		LO.6.2 - Hiểu rõ vai trò của cách mạng công nghiệp đối với sự phát triển.	2.1		
		LO.6.3 – Hiểu được công nghiệp Hoa là gì và các mô hình công nghiệp ở Việt Nam	2.1		
		LO.6.4 – Hiểu rõ tính tất yếu khách quan của công nghiệp hóa, hiện đại hóa ở Việt Nam	2.1		
		LO.6.5 – Nắm được những nội dung của công nghiệp hóa, hiện đại hóa ở Việt Nam.	2.1		
		LO.6.6 - Nắm được công nghiệp hóa, hiện đại hóa ở Việt Nam trong bối cảnh của cuộc cách mạng công nghiệp lần thứ 4	2.3		
		LO.6.7 – Hiểu rõ được hội nhập kinh tế quốc tế là gì. Vì sao hội nhập kinh tế quốc tế là sự cần thiết khách quan.	2.1		
		LO.6.8 - Nắm được những nội dung và tác động tích cực và tiêu cực của hội nhập kinh tế quốc tế.	2.3		

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIP CTDT	Mức độ giảng dạy (I/T/U)
		LO.6.9 – Nắm được phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế trong phát triển của Việt Nam			
<b>5.2. Kỹ năng</b>					
LO.7	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO7.1. Có kỹ năng khái quát hóa để rút ra Từ khóa tri thức đối với mỗi nội dung và tư duy có hệ thống LO7.2. Có kỹ năng trình bày thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn LO7.3. Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc	2.1  2.2  2.4		U4
<b>5.3. Thái độ</b>					
LO.8	THỂ HIỆN Ý THỨC NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	L.0.8.1. Có ý thức trách nhiệm bảo Vệ tính khoa học, cách mạng, nhân - văn của CN Mác Lênin L.O.8.2. Có ý thức, trách nhiệm các nhân đối với tập thể, cộng đồng L.0.8.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong cuộc sống.	2.1  2.2  2.3		U3

## 6. Kế hoạch giảng dạy theo buổi học (Course Plan):

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1 (1 tiết)	Giới thiệu về môn học	LO.1, LO.7;	Day: - Tự giới thiệu về giảng viên. - Giới thiệu đề cương và tài liệu môn học. - Hướng dẫn cách thức dạy và học vũ cách đánh giá. - Giới thiệu nội dung đề tài thuyết trình thiệu về môn học nhóm GIW . Học ở lớp: - Chia nhóm (5 SV/nham) - Giới thiệu nhóm học tập Học ngoài lớp:	

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
			-Chọn đề tài thuyết trình của nhóm (GHW) - Đọc trước tài liệu chương 1.	
2 (2 tiết)	<b>Chương 1</b> <b>ĐỐI TƯỢNG,</b> <b>PHƯƠNG PHÁP</b> <b>NGHIÊN CỨU VÀ</b> <b>CHỨC NĂNG CỦA</b> <b>KINH TẾ CHÍNH</b> <b>TRỊ MÁC - LÊNIN</b>	LO.1; LO.7 LO.8	Dạy: 1. SỰ HÌNH THÀNH VÀ PHÁT TRIỂN CỦA KỊCH MẶC – LÊNIN 1. 1. Giai đoạn từ cổ đại đến thế kỷ 18 2. Giai đoạn từ sau thế kỷ 18 đến nay II. ĐỐI TƯỢNG. PHƯƠNG PHÁP NGHIÊN CỨU CỦA KINH TẾ CHÍNH TRỊ MAC-LENIN. 1. Đối tượng nghiên cứu 2. Phương pháp nghiên cứu 3, Mục đích nghiên cứu III. CHỨC NĂNG CỦA TRI MAC-LENIN. 1. Chức năng nhận thức 2. Chức năng thực tiễn 3. Chức năng tư tưởng 4 Chức năng phương pháp luận Học ở lớp: Thảo luận và phát biểu trên lớp. Học ngoài lớp: Phác thảo nội dung thuyết trình nhóm GHW - Đọc trước tài liệu chương 2	Thi giữa kỳ (Quiz)
3 (6 tiết)	<b>Chương 2</b> <b>HÀNG HÓA, THỊ</b> <b>TRƯỜNG VÀ VAI</b> <b>TRÒ CỦA CÁC</b>		Dạy: I. LÝ LUẬN CỦA CÁC MẶC VỀ SẢN XUẤT HÀNG HOA VÀ HÀNG HÓA 1. Sản xuất hàng hóa: - Khái niệm sản xuất hàng - Điều kiện ra đời của sản 2. Hàng hóa - Khái niệm hàng hóa - Hai thuộc tính của hàng hóa - Lượng giá trị và các nhân tố ảnh hưởng đến lượng giá trị của hàng hóa	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
	CHỦ THỂ THAM GIA THỊ TRƯỜNG	LO.2 LO.7 LO.8	<p>- Tinh lại mặt của lao động sản xuất hàng hòa.</p> <p>3. Tiền</p> <p>- Nguồn gốc và bản chất của tiền</p> <p>- Chức năng của tiền</p> <p>4. Dịch vụ và một số hàng hóa đặc biệt.</p> <p>II. THỊ TRƯỜNG VÀ VAI TRÒ CỦA HÀNG HÓA, THỊ RƯỜNG VÀ VAI TRÒ CÁC CHỦ THỂ THAM GIA THỊ TRƯỜNG.</p> <p>1. Thị trường</p> <p>- Khái niệm về thị trường</p> <p>- Vai trò của thị trường.</p> <p>- Cơ chế thị trường</p> <p>- Nền kinh tế thị trường.</p> <p>2, Vai trò của các chủ thể tham gia thị trường.</p> <p>- Người sản xuất.</p> <p>- Người tiêu dùng.</p> <p>- Các chủ thể trung gian trong thị trường</p> <p>- Nhà nước.</p> <p>Học ở lớp: Thảo luận và phát biểu trên lớp.</p> <p>Học ngoài lớp:</p> <p>Đọc trước tài liệu chương 3</p>	
4 ( 6 tiết)	<b>Chương 3</b> GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.3 LO.7 LO.8	<p>Day:</p> <p>I. LÝ LUẬN CỦA CÁC MÁC VỀ GIÁ TRỊ THẶNG DƯ</p> <p>1. Nguồn gốc của giá trị thặng dư</p> <p>2. Bản chất của giá trị thặng dư</p> <p>3. Các phương pháp sản xuất giá trị thặng dư trong nền kinh tế thị trường tư bản chủ nghĩa.</p> <p>II. TÍCH LŨY TƯ BẢN.</p> <p>- Bản chất của tích lũy tư bản</p> <p>- Những nhân tố góp phần làm tăng quy mô tích lũy dụng nó trong cuộc sống.</p> <p>- Một số hệ quả của tích lũy tư bản.</p> <p>III. CÁC HÌNH THỨC BIỂU HIỆN GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG</p> <ol style="list-style-type: none"> <li>1. Lợi nhuận</li> <li>2. Lợi tức</li> <li>3. Địa tô tư bản chủ nghĩa</li> </ol>	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
			Học ở lớp: Thảo luận và phát triển ở lớp Học ngoài lớp: Hoàn thiện bài thuyết trình Đọc trước tài liệu chương 4	
5 (5 tiết)	<b>Chương 4</b> <b>CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG</b>	LO.4 LO.7 LO.8	<b>Dạy:</b> I. QUAN HỆ GIỮA CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG. II. ĐỘC QUYỀN VÀ ĐỘC QUYỀN NHÀ NƯỚC TRONG NỀN KINH TẾ THỊ 1. Lý luận của V.I.Lênin về độc quyền trong nền kinh tế thị trường. - Nguyên nhân hình thành và tốc độ của độc quyền trong chủ nghĩa tư bản. - Những đặc điểm kinh tế cơ bản của độc quyền trong chủ nghĩa tư bản 2. Lý luận của VII. Lê nin về độc quyền nhà nước trong chủ nghĩa tư bản, - Nguyên nhân ra đời và phát triển của độc quyền nhà nước trong chủ nghĩa tư bản. - Bản chất của độc quyền nhà nước trong chủ nghĩa tư bản - Những biểu hiện chủ yếu của độc quyền nhà nước trong chủ nghĩa tư bản. - Vai trò lịch sử của chủ nghĩa tư bản. <b>Học ở lớp:</b> Thảo luận và phát biểu trên <b>Học ngoài lớp:</b> Đọc trước tài liệu chương 5	Thuyết trình nhóm (GHW)  Thi cuối kỳ (FEX)
			<b>Dạy:</b> I. KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM	Thuyết trình nhóm (GHW)  Thi cuối kỳ (FEX)

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
6 (5 tiết)	<p><b>Chương 5</b> KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM</p>	LO.5 LO.7 LO.8	<p>1. Khái niệm kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam. 2. Tính tất yếu khách quan của việc phát triển kinh tế thị trường định hướng xã hội. chủ nghĩa ở Việt Nam. 3. Đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam.</p> <p><b>II. HOÀN THIỆN THỂ CHẾ KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM.</b></p> <p>1. Sự cần thiết phải hoàn thiện thể chế kinh Việt Nam. te thị trường định hướng xã hội chủ nghĩa ở Việt Nam. 2. Hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam một số khía cạnh chủ yếu.</p> <p><b>III. CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM.</b></p> <p>1. Lợi ích kinh tế và quan hệ lợi ích kinh tế. 2. 2 Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên <b>Học ngoài lớp</b> Hoàn thiện bài thuyết trình Đọc trước tài liệu chương 6</p>	
7 (5 tiết)	<p><b>Chương 6</b> CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP</p>	LO.6	<p><b>Dạy:</b></p> <p><b>I. CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA Ở VIỆT NAM.</b></p> <p>1. Khái quát cách mạng công nghiệp và công nghiệp hóa</p> <ul style="list-style-type: none"> <li>- Khái quát về cách mạng công nghiệp</li> <li>- Công nghiệp hóa và các mô hình công nghiệp hóa trên thế giới</li> </ul>	Thuyết trình nhóm (GHW)  Thi cuối ky (FEX)

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
	KINH TẾ QUỐC TẾ CỦA VIỆT NAM	LO.7 LO.8	<p>2. Tính tất yếu khách quan và nội dung của công nghiệp hóa, hiện đại hóa ở Việt Nam.</p> <ul style="list-style-type: none"> <li>- Tính tất yếu của công nghiệp hóa, hiện đại hóa ở Việt Nam.</li> <li>- Nội dung công nghiệp hóa, hiện đại hóa ở Việt Nam.</li> </ul> <p>3. Công nghiệp hóa, hiện đại hóa của Việt Nam trong bối cảnh cách mạng ông nghiệp lần thứ 4.</p> <p>II.HỘI NHẬP KINH TẾ QUỐC TẾ CỦA VIỆT NAM.</p> <p>1. Khái niệm và các hình thức hội nhập kinh tế quốc tế.</p> <ul style="list-style-type: none"> <li>- Khái niệm và sự cần thiết khách quan của hội nhập kinh tế quốc tế.</li> <li>- Những nội dung của hội nhập kinh tế quốc tế.</li> </ul> <p>2. Tác động của hội nhập kinh tế quốc tế đến phát triển của Việt Nam.</p> <ul style="list-style-type: none"> <li>- Tác động tích cực.</li> <li>- Tác động tiêu cực.</li> </ul> <p>3. Phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế trong phát triển của Việt Nam.</p> <p>Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Hoàn thiện bài thuyết trình.</p>	

## 7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm về đề tài phân công	Thuyết trình nhóm về đề tài đã phân công.	15%	Thuyết trình và bản báo cáo nhóm.	LO.4 LO.5 LO.6 LO.7 LO.8
2	Quiz	Bài thi giữa kì	Thi theo đề thi chung.	20%	Tự luận đề mở.	LO.2 LO.3
3	DIC	Thảo luận, chuyên cần	Điểm thảo luận được tính theo phương pháp	15%	Phát biểu/đặt câu hỏi trên lớp hoặc	LO.7 LO.8



STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
		tại lớp (Discussion in Class)	trương đối. SV có số lần thảo luận nhiều nhất tại lớp sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.		phiếu trả lời trong các nghiên cứu tình huống tại lớp.	
4	FEX	Thi cuối kì	Đề thi bao quát toàn bộ nội dung môn học.	50%	Tự luận đề đóng.	LO.2 LO.3 LO.4 LO.5 LO.6 LO.7 LO.8
			100%	100%		

### 8. Tiêu chí đánh giá chuẩn đầu ra môn học.

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết được vị trí của Kinh tế thị trường xã hội chủ nghĩa – Lênin trong hệ thống lịch sử tư tưởng kinh tế và nắm được đối tượng, phương pháp và chức năng của kinh tế thị trường xã hội chủ nghĩa – Lênin	Chương 1	Thi giữ kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2 LO.7	Nắm rõ nội dung: sản xuất hàng hóa, điều kiện ra đời của sản xuất hàng hóa, khái niệm hàng hóa và hai thuộc tính của hàng hóa, chất và lượng của giá trị hàng hóa, mối quan hệ giữa hai mặt của lao động sản xuất hàng hóa với hai thuộc tính của hàng hóa, các nhân tố ảnh hưởng đến lượng giá trị của hàng hóa, nguồn gốc ra đời, bản chất và chức năng của tiền. Thị trường, cơ chế thị trường, nền kinh tế thị trường và vai trò của chủ đề tham gia thị trường	Chương 2	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của GV
LO.3 LO.7	Hiểu rõ và nắm được những nội dung: tư bản lười? Công thức chung và mâu thuẫn công thức chung của tư bản. Hàng hóa sức lao động và tính chất đặc biệt của giá trị sử dụng hàng hóa sức lao động. Giá trị thặng dư và hai phương pháp sản xuất giá trị thặng dư. Tích lũy tư bản và những nhân tố làm tang quy mô tích lũy. Các khái niệm về chi phí sản xuất,	Chương 3	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
	lợi nhuận, lợi tức và giá trị tư bản chủ nghĩa			
LO.4 LO.7	Hiểu rõ và nắm vững những nội dung: quan hệ giữ cạnh tranh và độc quyền trong nền kinh tế thị trường. Tổ chức độc quyền là gì? ,nguyên nhân hình thành các tổ chức độc quyền. Những đặc điểm kinh tế cơ bản của độc quyền theo quan điểm của V.I. Lênin. Lý luận về độc quyền nhà nước trong chủ nghĩa tư bản. Vai trò lịch sử của chủ nghĩa tư bản	Chương 4	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá tuyệt trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV
LO.5 LO.7	Hiểu rõ và nắm vững những nội dung: kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam, những đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa. Thể chế kinh tế thị trường định hướng xã hội chủ nghĩa và sự cần thiết phải hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa. Lợi ích kinh tế và quan hệ lợi ích kinh tế. Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích.	Chương 5	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá tuyệt trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV
LO.6 LO.7	Hiểu rõ và nắm vững những nội dung: cách mạng công nghiệp là gì? Vai trò của cách mạng công nghiệp đối với sự phát triển. Công nghiệp hóa là gì? Các mô hình công nghiệp hóa tiêu biểu trên thế giới. Công nghiệp hóa, hiện đại hóa ở Việt Nam là gì? Tính tất yếu khách quan phải công nghiệp hóa, hiện đại hóa ở Việt Nam. Công nghiệp hóa, hiện đại hóa ở Việt Nam trong bối cảnh cuộc cách mạng công nghiệp lần thứ 4. Hội nhập kinh tế quốc tế là gì, Sự cần thiết khách quan phải hội nhập kinh tế quốc tế. Tác động của hội nhập kinh tế quốc tế của Việt Nam. Phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế	Chương 6	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá tuyệt trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV

### 9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với giảng viên qua email: [lethong0804@gmail.com](mailto:lethong0804@gmail.com)
- Quy định về Bài thuyết trình nhóm GHW

Thành lập nhóm: 5 sinh viên/ nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2 hoặc trực tiếp cập nhật cho GV buổi 1.

Tuần 4 (buổi thứ 4) thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình.

Hình thức nộp bài: Nộp file và biên bản làm việc theo nhóm qua mail cho GV

- Quy định về giờ ngủ, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự kiến thiếu 80% thời gian học trên lớp (chưa được phép bỏ qua mặt tối đa 20% số liệu học). Nếu bỏ qua số lượng quy định quy định sẽ bị cấm thi theo quy định. Có đầy đủ điểm kiểm tra, điểm thi kết thúc học phần & nhiệt thảo luận, phát biểu xây dựng bài, nghiêm trọng trong giờ học.

TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2020

**KT. TRƯỜNG KHOA  
PHÓ TRƯỞNG KHOA**



**TS. Nguyễn Đình Quốc Cường**

## ĐỀ CƯƠNG CHI TIẾT MÔN HỌC

### Chủ nghĩa xã hội khoa học

#### 1. Thông tin chung

Tên môn học (tiếng Việt):	Chủ nghĩa xã hội khoa học
Tên môn học (tiếng Anh):	Scientific socialism
Mã số môn học:	PE017IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
<i>Số tiết lý thuyết:</i>	<i>30 (trên lớp)</i>
<i>Số tiết thực hành:</i>	
<i>Số tiết tự học:</i>	<i>60 (về nhà)</i>
Môn học trước:	1. Kinh tế chính trị Mác - Lênin, 2. Triết học Mác - Lênin
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

(Scientific socialism)

#### 2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

2.1. Môn học trang bị cho sinh viên những nội dung cơ bản của chủ nghĩa xã hội khoa học (một trong ba bộ phận cấu thành chủ nghĩa Mác - Lênin).

2.2. Giúp cho sinh viên vận dụng những tri thức cơ bản của chủ nghĩa xã hội khoa học một cách sáng tạo trong hoạt động nhận thức và thực tiễn, nhằm giải quyết những vấn đề mà đời sống xã hội của đất nước, của thời đại đang đặt ra.

#### 3. Mô tả môn học (Course Outlines)

Môn học trang bị cho sinh viên những kiến thức cơ bản về chủ nghĩa xã hội khoa học

#### 4. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Giáo trình Chủ nghĩa xã hội khoa học*, Nxb. Chính trị quốc gia, Hà Nội.
- Bộ Giáo dục và Đào tạo (2012), *Giáo trình Những Nguyên lý cơ bản của chủ nghĩa Mác-Lenin*, Nxb. Chính trị quốc gia, Hà Nội.
- Hội đồng Trung ương (2008), *Giáo trình Chủ nghĩa xã hội khoa học*, Nxb. Chính trị quốc gia, Hà Nội.

### 5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
<b>5.1. Kiến thức</b>					
LO.1	NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỌC	LO.1.1 – Khái lược sự ra đời Chủ nghĩa xã hội khoa học, hoàn cảnh lịch sử và vai trò của Các Mác và PH.Ăngghen LO.1.2 – Nhận biết được các giai đoạn phát triển cơ bản của Chủ nghĩa xã hội khoa học thể hiện qua các tác phẩm LO.1.3 – Nắm rõ được đối tượng, phương pháp và ý nghĩa của việc nghiên cứu Chủ nghĩa xã hội khoa học	2.1	1.1.3	<b>13</b>
LO.2	SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN	LO.2.1- Hiểu rõ khái niệm giai cấp công nhân và đặc điểm của giai cấp công nhân LO.2.2 – Nắm rõ nội dung, đặc điểm sứ mệnh lịch sử của giai cấp công nhân LO.2.3 – Giải thích được những điều kiện quy định sứ mệnh lịch sử của giai cấp công nhân LO.2.4 – Phân tích được những điểm tương đồng và khác biệt của giai cấp công nhân hiện nay và việc thực hiện sứ mệnh của giai cấp công nhân trên thế giới hiện nay LO.2.5 – Nắm rõ những đặc điểm cơ bản của giai cấp công nhân Việt Nam và nội dung sứ mệnh lịch sử của giai cấp công nhân Việt Nam hiện nay LO.2.6 – Trình bày được phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay	2.1 2.1 2.1 2.1 2.1 2.2 2.1 2.2	1.1.3	T4
LO.3		LO.3.1 – Hiểu rõ Chủ nghĩa xã hội là giai đoạn đầu của hình thái kinh tế - xã hội công sản chủ nghĩa LO.3.2 – Trình bày được những			

	CHỦ NGHĨA XÃ HỘI VÀ THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	đặc trưng cơ bản của chủ nghĩa xã hội	2.1	1.1.3	I3
		LO.3.3 – Giải thích được tính tất yếu khách quan của thời kỳ quá độ lên chủ nghĩa xã hội và những đặc điểm cơ bản của thời kỳ quá độ lên chủ nghĩa xã hội			
		LO.3.4 – Hiểu rõ đặc trưng của thời kỳ quá độ và chủ nghĩa xã hội ở Việt Nam, trình bày được những phương hướng xây dựng chủ nghĩa xã hội ở Việt Nam hiện nay			
LO.4	DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA	LO.4.1 – Giải thích được quan niệm về dân chủ và sự ra đời và phát triển dân chủ trong lịch sử xã hội loài người	2.1		
		LO.4.2 – Nắm rõ quá trình ra đời và bản chất của nền dân chủ xã hội chủ nghĩa	2.1		
		LO.4.3 – Hiểu được sự ra đời, bản chất và chức năng của nhà nước xã hội chủ nghĩa cũng như mối quan hệ giữa dân chủ và nhà nước	2.1	1.1.3	T4
		LO.4.4 - hiểu được sự ra đời phát triển và bản chất của nền dân chủ xã hội chủ nghĩa ở Việt Nam	2.1		
		LO.4.5 - trình bày được đặc điểm và các giải pháp cơ bản nhằm xây dựng nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam hiện nay	2.1 2.2		
LO.5	CƠ CẤU XÃ HỘI GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.5.1 – Trình bày được khái niệm cơ cấu xã hội – khái quát và sự biến đổi của cơ cấu xã hội giai cấp trong thời kì quá độ lên chủ nghĩa xã hội			
		LO.5.2 – giải thích được tính tất yếu của liên minh giai cấp, tầng trong thời kỳ quá độ lên chủ nghĩa xã hội	2.1	1.1.3	I3
		LO.5.3 – Hiểu rõ cơ cấu xã hội – giai cấp ở Việt Nam trong thời kì quá độ và trình bày những giải pháp cơ bản nhằm xây dựng, phát triển lối liên minh giai cấp, tầng lớp xã hội ở Việt Nam			
		LO.6.1 – Hiểu rõ khái niệm, đặc trưng cơ bản của dân tộc và quan điểm của chủ nghĩa Mác – Lenin về vấn đề dân tộc	2.1		

LO.6	VẤN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.6.2 – Trình bày được những đặc điểm cơ bản của dân tộc ở Việt Nam và quan điểm chính sách dân tộc của Đảng và Nhà nước Việt Nam	2.1	1.1.3	T4
		LO.6.3 – Hiểu được bản chất, nguồn gốc, tính chất của tôn giáo và nguyên tắc cơ bản giải quyết vấn đề tôn giáo trong thời kỳ quá độ lên chủ nghĩa xã hội	2.1		
		LO.6.4 – Giải thích được những đặc điểm tôn giáo ở Việt Nam và chính sách của Đảng và Nhà nước Việt Nam đối với tín ngưỡng tôn giáo hiện nay	2.1 2.2		
		LO.6.5 – Hiểu rõ được đặc điểm quan hệ dân tộc và tôn giáo ở Việt Nam và trình bày được các định hướng cơ bản nhằm giải quyết mối quan hệ giữa dân tộc và tôn giáo ở Việt Nam hiện nay	2.1 2.2		
LO.7	VẤN ĐỀ GIA ĐÌNH TRONG THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.7.1 – Khái lược được vị trí, chức năng và vai trò của gia đình trong xã hội	2.1	1.1.3	I3
		LO.7.2 – Nhận biết được các cơ sở xây dựng gia đình trong thời kỳ quá độ lên chủ nghĩa xã hội			
		LO.7.3 – Giải thích được sự biến đổi của gia đình Việt Nam trong thời kỳ quá độ và trình bày được những phương hướng cơ bản xây dựng và phát triển gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội			
<b>5.2. Kỹ năng</b>					
LO.8	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANG LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.8.1 – Có kỹ năng khái quát hóa để rút ra <i>Từ khóa trí thức</i> đối với mỗi nội dung và tư duy có hệ thống	2.1 2.2	2.1.1 2.3.1	U4
		LO.8.2 – Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn		2.4.4	
		LO.8.3 – Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc		2.5 3.1.5	
		LO.9.1 – Có ý thức trách nhiệm			

LO.9	THỂ HIỆN Ý THỨC NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	bảo vệ tính khoa học, cách mạng trong lý luận của chủ nghĩa Mác – Leenin về CNXH và con đường đi lên CNXH ở Việt Nam	2.1	3.1	U3
		LO.9.2 – Có ý thức, trách nhiệm cá nhân đối với tập thể, cộng đồng	2.2		
		LO.9.3 – Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong cuộc sống			

### 6.Kế hoạch giảng dạy theo buổi học (Course Plan):

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1 (tiết 1)	Giới thiệu về môn học	LO.1 LO.4	<p><b>Dạy:</b></p> <ul style="list-style-type: none"> <li>-Giới thiệu đề cương môn học</li> <li>-Giới thiệu nội dung đề tài thuyết trình nhóm (GHW)</li> </ul> <p><b>Học ở lớp:</b></p> <ul style="list-style-type: none"> <li>-Chia nhóm (5 SV/nhóm)</li> <li>-Giới thiệu nhóm học tập</li> </ul> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>-Chọn đề tài thuyết trình của nhóm (GHW)</li> <li>-Đọc trước tài liệu chương 1.</li> </ul>	
2	<b>Chương 1</b> NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỌC		<p>Dạy:</p> <p>1.SỰ RA ĐỜI CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌC</p> <p>1.1. Hoàn cảnh lịch sử sự ra đời của chủ nghĩa xã hội khoa học</p> <p>1.2. Vai trò của C. Mác và Ăngghen</p> <p>2.CÁC GIAI ĐOẠN PHÁT TRIỂN CƠ BẢN CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌC</p> <p>2.1. C. Mác và Ph.Ăngghen phát triển chủ nghĩa xã hội khoa học</p> <p>2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới</p> <p>2.3. Sự vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học từ sau khi lênin qua đời đến nay</p> <p>3.ĐỐI TƯỢNG, PHƯƠNG PHÁP VÀ Ý NGHĨA CỦA VIỆC NGHIÊN CỨU CHỦ NGHĨA XÃ HỘI KHOA HỌC</p> <p>3.1. Đối tượng nghiên cứu của chủ nghĩa xã hội khoa học</p> <p>3.2. Phương pháp nghiên cứu của chủ nghĩa xã hội khoa học</p>	Thi giữa kì (Quiz)



			<p>Ý nghĩa của việc nghiên cứu chủ nghĩa xã hội khoa học</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>-Phác thảo nội dung thuyết trình nhóm GHW</li> <li>-Đọc trước tài liệu chương 2.</li> </ul>	
3	<p><b>Chương 2</b> SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN</p>	<p>LO.2 LO.4 LO.5</p>	<p><b>Dạy:</b></p> <p>1. QUAN ĐIỂM CƠ BẢN CỦA CHỦ NGHĨA MÁC - LEENIN VỀ GIAI CẤP CÔNG NHÂN VÀ SỨ MỆNH LỊCH SỬ THẾ GIỚI CỦA GIAI CẤP CÔNG NHÂN</p> <p>1.1. Khái niệm và đặc điểm của giai cấp công nhân</p> <p>1.2. Nội dung và đặc điểm sứ mệnh lịch sử của giai cấp công nhân</p> <p>1.3. Những điều kiện quy định sứ mệnh lịch sử của giai cấp công nhân</p> <p>2. GIAI CẤP CÔNG NHÂN VÀ VIỆC THỰC HIỆN SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN HIỆN NAY</p> <p>2.1. Giai cấp công nhân hiện nay</p> <p>2.2. Thực hiện sứ mệnh lịch sử của giai cấp công nhân trên thế giới hiện nay</p> <p>3. SỨ MỆNH LỊCH SỬ CỦA GIAI CẤP CÔNG NHÂN VIỆT NAM</p> <p>3.1. Đặc điểm của giai cấp công nhân Việt Nam</p> <p>3.2. Nội dung sứ mệnh lịch sử của giai cấp công nhân Việt Nam hiện nay</p> <p>3.3. Phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p> <p>Đọc trước tài liệu chương 3</p>	<p>Thi giữa kỳ (Quiz)</p>
4	<p><b>Chương 3</b> CHỦ NGHĨA XÃ HỘI VÀ THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p>	<p>LO.3 LO.4 LO.5</p>	<p><b>Dạy:</b></p> <p>1. CHỦ NGHĨA XÃ HỘI</p> <p>1.1. Chủ nghĩa xã hội, giai đoạn đầu của hình thái kinh tế - xã hội công sản chủ nghĩa</p> <p>1.2. Điều kiện ra đời chủ nghĩa xã hội</p> <p>1.3. Những đặt trưng cơ bản của chủ nghĩa xã hội</p> <p>2. THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p>	<p>Thuyết trình nhóm</p>

			<p>2.1. Tính tất yếu khách quan của thời kỳ quá độ lên chủ nghĩa xã hội</p> <p>2.2. Đặc điểm của thời kỳ quá độ lên chủ nghĩa xã hội</p> <p>3. QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM</p> <p>3.1. Quá độ lên chủ nghĩa xã hội bỏ qua chế độ tư bản chủ nghĩa</p> <p>3.2. Những đặc trưng cơ bản của chủ nghĩa xã hội và phương hướng xây dựng chủ nghĩa xã hội ở Việt Nam hiện nay</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 4</p>	<p>(GHW)</p> <p>Thi giữa kỳ (Quiz)</p>
5	<p><b>Chương 4</b> DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA</p>	<p>LO.2 LO.4 LO.5</p>	<p><b>Dạy:</b></p> <p>1. DÂN CHỦ VÀ DÂN CHỦ XÃ HỘI CHỦ NGHĨA</p> <p>1.1. Dân chủ và sự ra đời, phát triển của dân chủ</p> <p>1.2. Dân chủ xã hội chủ nghĩa</p> <p>2. NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA</p> <p>2.1. Sự ra đời, bản chất, chức năng của nhà nước xã hội chủ nghĩa</p> <p>2.2. Mối quan hệ giữa dân chủ xã hội chủ nghĩa và nhà nước xã hội chủ nghĩa</p> <p>3. DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC PHÁP QUYỀN XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM</p> <p>3.1. Dân chủ xã hội chủ nghĩa ở Việt Nam</p> <p>3.2. Nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam hiện nay</p> <p>3.3. Phát huy dân chủ xã hội chủ nghĩa, xây dựng nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 5 trên lớp</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>
6	<p><b>Chương 5</b> CƠ CẤU XÃ HỘI – GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p>	<p>LO.3 LO.4 LO.5</p>	<p><b>Dạy:</b></p> <p>1. CƠ CẤU XÃ HỘI GIAI CẤP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p> <p>1.1. Khái niệm và vị trí của cơ cấu xã hội - giai cấp trong cơ cấu xã hội</p> <p>1.2. Sự biến đổi có tính quy luật của cơ cấu xã hội - giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội</p> <p>2. LIÊN MINH GIAI CẤP, TẦNG</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối</p>

			<p><b>LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</b></p> <p><b>3.CƠ CẤU XÃ HỘI - GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM</b></p> <p>3.1. Cơ cấu xã hội - giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam</p> <p>3.2. Liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 6</p>	kỳ (FEX)
7	<p><b>Chương 6</b></p> <p><b>VẤN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</b></p>	<p>LO.2</p> <p>LO.4</p> <p>LO.5</p>	<p><b>Dạy:</b></p> <p><b>1.DÂN TỘC TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</b></p> <p>1.1. Chủ nghĩa Mác - Lênin về dân tộc</p> <p>1.2. Dân tộc và quan hệ dân tộc ở Việt Nam</p> <p><b>2.TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</b></p> <p>2.1. Chủ nghĩa Mác - Lênin về tôn giáo</p> <p>2.2. Tôn giáo ở Việt Nam và chính sách tôn giáo của Đảng, Nhà nước ta hiện nay</p> <p><b>3.QUAN HỆ DÂN TỘC VÀ TÔN GIÁO Ở VIỆT NAM</b></p> <p>3.1. Đặc điểm quan hệ dân tộc và tôn giáo ở Việt Nam</p> <p>3.2. Định hướng giải quyết mối quan hệ dân tộc và tôn giáo ở Việt Nam hiện nay</p> <p>3.3. Phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 7</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>
			<p><b>Dạy:</b></p> <p><b>1.KHÁI NIỆM, VỊ TRÍ VÀ CHỨC NĂNG CỦA GIA ĐÌNH</b></p> <p>1.1. Khái niệm gia đình</p> <p>1.2. Vị trí của gia đình trong xã hội</p>	

8	<p style="text-align: center;"><b>Chương 7</b>  <b>VẤN ĐỀ GIA ĐÌNH TRONG THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</b></p>	<p>1.3. Chức năng cơ bản của gia đình  2. CƠ SỞ XÂY DỰNG GIA ĐÌNH TRONG THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI  2.1. Cơ sở kinh tế - xã hội  2.2. Cơ sở chính trị - xã hội  2.3. Cơ sở văn hóa  3. XÂY DỰNG GIA ĐÌNH VIỆT NAM TRONG THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI  3.1. Sự biến đổi gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội  3.2. Phương hướng cơ bản xây dựng và phát triển gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội  <b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp  <b>Học ngoài lớp:</b>  Hoàn thiện bài thuyết trình</p>	<p>Thuyết trình nhóm (GHW)   Thi cuối kỳ (FEX)</p>
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## 7. Đánh giá môn học

ST T	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	15%	Thuyết trình và bản báo cáo nhóm	LO.3 LO.4 LO.5 LO.6 LO.7
2	Quiz	Bài thi giữa kì	Thi theo đề thi của GV	20%	Tự luận đề mở	LO.1 LO.2 LO.3
3	DIC	Thảo luận, chuyên cần tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.3 LO.4 LO.5 LO.6 LO.7
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận đề đóng	LO.3 LO.4 LO.5 LO.6 LO.7
			Tổng cộng	100%		

## 8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết quá trình ra đời của Chủ nghĩa xã hội khoa học và các giai đoạn phát triển cơ bản	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2 LO.4	Nắm rõ nội dung: quan điểm cơ bản của chủ nghĩa Mác - Lênin về giai cấp công nhân, nội dung, biểu hiện và ý nghĩa của sứ mệnh đó trong bối cảnh hiện nay	Chương 2	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - Lênin về chủ nghĩa xã hội, thời kỳ quá độ lên chủ nghĩa xã hội và sự vận dụng sáng tạo của Đảng Cộng sản Việt Nam vào điều kiện cụ thể của Việt Nam	Chương 3	Thảo luận tại lớp (Discussion in Class) Thi giữa kỳ (Quiz)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp  Ngân hàng đề thi của GV
LO.3 LO.4	Nhận biết và nắm được bản chất của nền dân chủ xã hội chủ nghĩa và nhà nước xã hội chủ nghĩa nói chung và ở Việt Nam nói riêng	Chương 4	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp
LO.3 LO.4	Nhận biết và nắm được những kiến thức nền tảng về cơ cấu xã hội - giai cấp và liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội	Chương 5	Thảo luận tại lớp (Discussion in Class), Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp  Ngân hàng đề thi của Khoa
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - Lênin về dân tộc, tôn giáo, mối quan hệ giữa dân tộc và tôn giáo, tầm quan trọng của vấn đề dân tộc, tôn giáo và nội dung chính sách dân tộc, tôn giáo của Đảng và Nhà nước Việt Nam	Chương 6	Thảo luận tại lớp (Discussion in Class), Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp  Ngân hàng đề thi của Khoa
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - Lênin, tư tưởng Hồ Chí Minh và Đảng Cộng sản Việt Nam về gia đình, xây dựng gia đình trong thời kỳ quá độ lên chủ nghĩa xã hội hiện nay.	Chương 7	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp  Ngân hàng đề thi của Khoa

### 9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn

Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email:

[daotao.spas@vnuhcm.edu.vn](mailto:daotao.spas@vnuhcm.edu.vn)

- Quy định về Bài thuyết trình nhóm GHW

Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2 hoặc trực tiếp nộp cho GV buổi 1.

Giảng dạy kết thúc chương 3, các nhóm thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình

Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV

- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị cấm thi theo quy chế. Có đầy đủ điểm kiểm tra, điểm thi kết thúc học phần và nhiệt tình thảo luận, phát biểu xây dựng bài, nghiêm túc trong giờ học.

*TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2019*

**KT. TRƯỞNG KHOA PHÓ TRƯỞNG KHOA**



**TS. Nguyễn Đình Quốc Cường**

**ĐỀ CƯƠNG CHI TIẾT MÔN HỌC**

**Lịch sử Đảng Cộng sản Việt Nam**  
 (History of Vietnamese communist party)

**1. Thông tin chung:**

Tên môn học (tiếng Việt):	Lịch sử Đảng Cộng sản Việt Nam
Tên môn học (tiếng Anh):	History of Vietnamese communist party
Mã số môn học:	PE018IU
Thuộc khối kiến thức:	CƠ SỞ
Số tín chỉ:	2
<i>Số tiết lý thuyết:</i>	<i>20 (trên lớp)</i>
<i>Số tiết thực hành:</i>	<i>10 (trên lớp)</i>
<i>Số tiết tự học:</i>	<i>90 (về nhà)</i>
Môn học trước:	1. Triết học Mác - Lênin, 2. Kinh tế chính trị Mác - Lênin, 3. Chủ nghĩa xã hội khoa học
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

**2. Mục đích/mục tiêu môn học (Course Purposes/Aims)**

- 2.1 *Về nội dung:* cung cấp những tri thức có tính hệ thống, cơ bản về sự ra đời của Đảng Cộng sản Việt Nam (1920-1930), sự lãnh đạo của Đảng đối với cách mạng Việt Nam trong thời kỳ đấu tranh giành chính quyền (1930-1945), trong hai cuộc kháng chiến chống thực dân Pháp và đế quốc Mỹ xâm lược (1945-1975), trong sự nghiệp xây dựng, bảo vệ tổ quốc thời kỳ cả nước quá độ lên chủ nghĩa xã hội, tiến hành công cuộc đổi mới (1975-2018).
- 2.2 *Về tư tưởng:* Thông qua các sự kiện lịch sử và các kinh nghiệm về sự lãnh đạo của Đảng để xây dựng ý thức tôn trọng sự thật khách quan, nâng cao lòng tự hào, niềm tin đối với sự nghiệp lãnh đạo của Đảng.
- 2.3 *Về kỹ năng:* Trang bị phương pháp tư duy khoa học về lịch sử, kỹ năng lựa chọn tài liệu nghiên cứu, học tập môn học và khả năng vận dụng nhận thức lịch sử vào công tác thực tiễn, phê phán quan niệm sai trái về lịch sử của Đảng.



### 3. Mô tả môn học (Course Outlines)

Môn học trang bị cho sinh viên những kiến thức cơ bản về Lịch sử Đảng Cộng sản Việt Nam

### 4. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Chương trình môn học Lịch sử Đảng Cộng sản Việt Nam*, ban hành 2019.

- Hội đồng Trung ương chỉ đạo biên soạn giáo trình quốc gia các môn khoa học Mác — Lênin, Tư tưởng Hồ Chí Minh (2018), *Giáo trình Lịch sử Đảng Cộng sản Việt Nam (tái bản có sửa chữa, bổ sung)*, Nxb. Chính trị quốc gia, Hà Nội.

### 5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
5.7. Kiến thức					
LO.1	NHẬP MÔN ĐỐI TƯỢNG, CHỨC NĂNG, NHIỆM VỤ, NỘI DUNG VÀ PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM	LO. 1.1 - Hiểu rõ được đối tượng, mục đích học tập, nghiên cứu và một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu Lịch sử Đảng Cộng sản Việt Nam	2.1	1.1.3	13
LO.2	ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ LÃNH ĐẠO ĐẦU TRANH GIÀNH CHÍNH QUYỀN (1930-1945)	LO.2.1 - Hiểu được bối cảnh lịch sử tác động đến sự ra đời của Đảng Cộng sản Việt Nam	2.1	1.1.3	T4
		LO.2.2 - Hiểu được quá trình chuẩn bị các điều kiện để thành lập Đảng của Nguyễn Ái Quốc	2.1		
		LO.2.3- Hiểu được nội dung hội nghị thành lập Đảng và Cương lĩnh chính trị đầu tiên của Đảng	2.1		
		LO.2.4 - Hiểu được ý nghĩa lịch sử của việc thành lập Đảng Cộng sản Việt Nam	2.1		
		LO.2.5 - Hiểu rõ các phong trào cách mạng 1930-1935 và các chủ trương khôi phục phong trào năm 1932-1935	2.1		
		LO.2.6 - Hiểu rõ phong trào dân chủ năm 1936-1939	2.1		

		LO.2.7 - Nắm rõ phong trào giải phóng dân tộc 1939-1945			
		LO.2.8 - Hiểu rõ tính chất, ý nghĩa và kinh nghiệm của Cách mạng Tháng Tám năm 1945	2.1		
LO.3	ĐẢNG LÃNH ĐẠO HAI CUỘC KHÁNG CHIẾN, HOÀN THÀNH GIẢI PHÓNG DÂN TỘC, THỐNG NHẤT ĐẤT NƯỚC (1945-1975)	LO.3.1 - Hiểu được chủ trương xây dựng và bảo vệ chính quyền cách mạng 1945-1946	2.1	1.1.3	T4
		LO.3.2 - Hiểu rõ Đường lối kháng chiến toàn quốc chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946-1950	2.1	1.1.3	T4
		LO.3.3 - Hiểu rõ chủ trương Đẩy mạnh cuộc kháng chiến chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946 đến năm 1950	2.1	1.1.3	T4
		LO.3.4 - Hiểu rõ được Ý nghĩa lịch sử và kinh nghiệm của Đảng trong lãnh đạo kháng chiến chống thực dân Pháp và can thiệp Mỹ			
		LO.3.5 - Nắm được quá trình lãnh đạo cách mạng hai miền giai đoạn 1954-1965 của Đảng			
		LO.3.6 - Nắm vững sự lãnh đạo cách mạng cả nước giai đoạn 1965-1975 của Đảng	2.1		
		LO.3.7 - Hiểu rõ Ý nghĩa và kinh nghiệm lãnh đạo của Đảng trong cuộc kháng chiến chống Mỹ, cứu nước 1954-1975			
LO.4	ĐẢNG LÃNH ĐẠO CẢ NƯỚC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIẾN HÀNH CÔNG CUỘC ĐỔI MỚI (1975-2018)	LO.4.1 - Hiểu rõ chủ trương xây dựng chủ nghĩa xã hội và bảo vệ Tổ quốc 1975-1981			
		LO.4.2 - Nắm rõ nội dung Đại hội đại biểu toàn quốc lần thứ V của Đảng và các bước đột phá tiếp tục đổi mới kinh tế 1982-1986	2.1	1.1.3	T4
		LO.4.3 – Nắm rõ quan điểm Đổi mới toàn diện, đưa đất nước ra khỏi khủng hoảng kinh tế - xã hội 1986-1996 của Đảng	2.2		
		LO.4.4 - Nắm rõ thành tựu, kinh nghiệm của công cuộc đổi mới			
		LO.4.5 - Hiểu rõ những thắng lợi vĩ đại của cách mạng Việt Nam dưới sự lãnh đạo của Đảng từ năm	2.1		
		LO.4.6 - Hiểu rõ những bài học lớn về sự lãnh đạo của Đảng từ năm 1930 đến 2018	2.2		

## 5.2. Kỹ năng

LO.5	<p style="text-align: center;">THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM</p>	<p>LO.5.1. Rèn luyện năng lực tư duy độc lập trong nghiên cứu đường lối, chiến lược, sách lược cách mạng của Đảng.</p> <p>LO.5.2. Có tư duy phê phán, kỹ năng phân tích, tổng hợp và đánh giá những vấn đề liên quan đến môn học. Từ đó, vận dụng kiến thức đã học để chủ động, tích cực nhận thức những vấn đề chính trị, kinh tế, văn hoá, xã hội theo đường lối, chính sách, pháp luật của Đảng và Nhà nước.</p> <p>LO.5.3 Có kỹ năng viết, kỹ năng làm việc cá nhân, làm việc nhóm và trình bày kết quả nghiên cứu.</p>	2.1 2.2 2.3	2.1.1 2.3.1  2.4.4  2.5 3.1.5	U4
<b>5.3. Thái độ</b>					
LO.6	<p style="text-align: center;">THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP</p>	<p>LO.6.1. Tin tưởng vào sự lãnh đạo của Đảng đối với cách mạng Việt Nam.</p> <p>LO.6.2. Quyết tâm phấn đấu thực hiện đường lối cách mạng của Đảng.</p> <p>LO.6.3. Có thái độ nghiêm túc trong học tập, nghiên cứu khoa học, trong nhận thức về cuộc sống, xã hội, tự rèn luyện bản thân trở thành người có phẩm chất, bản lĩnh chính trị vững vàng, có đạo đức, trình độ chuyên môn tốt; hình thành tình cảm, niềm tin vào con đường cách mạng mà dân tộc ta đã lựa</p>	2.1 2.2 2.3	3.1	U3

## 6.Kế hoạch giảng dạy môn học (Course Plan):

Buổi (3 tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1	Giới thiệu về môn học	LO.1, LO.5;	<b>Dạy:</b> - Giới thiệu đề cương môn học - Giới thiệu nội dung đề tài thuyết trình nhóm (GHW) <b>Học ở lớp:</b> - Chia nhóm (5 SV/nhóm) - Giới thiệu nhóm học tập <b>Học ngoài lớp:</b> - Chọn đề tài thuyết trình của nhóm (GHW)	
2	<b>Chương nhập môn</b> ĐỐI TƯỢNG, CHỨC NĂNG, NHIỆM VỤ, NỘI DUNG VÀ PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM	LO.1;	<b>Dạy:</b> I. ĐỐI TƯỢNG NGHIÊN CỨU CỦA MÔN HỌC LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM 1.Đối tượng nghiên cứu 2.Phạm vi nghiên cứu II.CHỨC NĂNG, NHIỆM VỤ CỦA MÔN HỌC LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM 1.Chức năng của khoa học Lịch sử Đảng 2.Nhiệm vụ của môn học III.PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP MÔN LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM 1.Phương pháp luận 2.Các phương pháp cụ thể <b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp <b>Học ngoài lớp:</b> - Phác thảo nội dung thuyết trình nhóm GHW - Đọc trước tài liệu chương 1.	Thi giữa kỳ (Quiz)

3	<p style="text-align: center;"><b>Chương 1</b> ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ LÃNH ĐẠO ĐẤU TRANH GIÀNH CHÍNH QUYỀN (1930-1945)</p>	LO.2	<p><b>Dạy:</b> I. ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ CƯƠNG LĨNH CHÍNH TRỊ ĐẦU TIÊN CỦA ĐẢNG (THÁNG 2-1930) 1. Bối cảnh lịch sử 2. Nguyễn Ái Quốc chuẩn bị các điều kiện để thành lập Đảng 3. Thành lập Đảng Cộng sản Việt Nam và Cương lĩnh chính trị đầu tiên của Đảng 4. Ý nghĩa lịch sử của việc thành lập Đảng Cộng sản Việt Nam II. ĐẢNG LÃNH ĐẠO ĐẤU TRANH GIÀNH CHÍNH QUYỀN (1930-1945) 1. Phong trào cách mạng 1930- 1935 và khôi phục phong trào 1932-1935 2. Phong trào dân chủ 1936-1939 3. Phong trào giải phóng dân tộc 1939-1945 4. Tính chất, ý nghĩa và kinh nghiệm của Cách mạng Tháng Tám năm 1945 <b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp <b>Học ngoài lớp:</b> Đọc trước tài liệu chương 2</p>	<p>Thi giữa kỳ (Quiz)  Thi cuối kỳ (FEX)</p>
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4	<p style="text-align: center;"><b>Chương 2</b> ĐẢNG LÃNH ĐẠO HAI CUỘC KHÁNG CHIẾN, HOÀN THÀNH GIẢI PHÓNG DÂN TỘC, THỐNG NHẤT ĐẤT NƯỚC (1945-1975)</p>	LO.3 LO.5	<p><b>Dạy:</b> I. ĐẢNG LÃNH ĐẠO XÂY DỰNG, BẢO VỆ CHÍNH QUYỀN CÁCH MẠNG VÀ KHÁNG CHIẾN CHỐNG THỰC DÂN PHÁP XÂM LƯỢC (1945-1954) 1. Xây dựng và bảo vệ chính quyền cách mạng 1945-1946 2. Đường lối kháng chiến toàn quốc chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946-1950 3. Đẩy mạnh cuộc kháng chiến chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946 đến năm 1950 4. Ý nghĩa lịch sử và kinh nghiệm của Đảng trong lãnh đạo kháng chiến chống thực dân Pháp và can thiệp Mỹ</p>	<p>Thuyết trình nhóm (GHW)  Thi cuối kỳ (FEX)</p>	
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			<p><b>Dạy:</b> Chấm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Các nhóm thuyết trình tại lớp</p> <p>II. LÃNH ĐẠO XÂY DỰNG CHỦ NGHĨA XÃ HỘI Ở MIỀN BẮC VÀ KHÁNG CHIẾN CHỐNG ĐẾ QUỐC MỸ XÂM LƯỢC GIẢI PHÓNG MIỀN NAM, THỐNG NHẤT ĐẤT NƯỚC (1954-1975)</p> <ol style="list-style-type: none"> <li>Lãnh đạo cách mạng hai miền giai đoạn 1954-1965</li> <li>Lãnh đạo cách mạng cả nước giai đoạn 1965-1975</li> <li>Ý nghĩa và kinh nghiệm lãnh đạo của Đảng trong cuộc kháng chiến chống Mỹ, cứu nước 1954-1975</li> </ol> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 2</p>		
5	<p><b>Chương 3</b> ĐẢNG LÃNH ĐẠO CẢ NƯỚC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIỀN HÀNH CÔNG CUỘC ĐỔI MỚI (1975-2018)</p>	<p>LO.4 LO.5</p>	<p><b>Dạy</b></p> <p>I.ĐẢNG LÃNH ĐẠO CẢ NƯỚC XÂY DỰNG CHỦ NGHĨA XÃ HỘI VÀ BẢO VỆ TÔ QUỐC (1975-1986)</p> <ol style="list-style-type: none"> <li>Xây dựng chủ nghĩa xã hội và bảo vệ Tô quốc 1975-1981</li> <li>Đại hội đại biểu toàn quốc lần thứ V của Đảng và các bước đột phá tiếp tục đổi mới kinh tế 1982-1986</li> </ol> <p><b>Dạy:</b> Chấm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Thảo luận tại lớp</p> <p>III.LÃNH ĐẠO CÔNG CUỘC ĐỔI MỚI, ĐẨY MẠNH CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP QUỐC TẾ (1986-2018)</p> <ol style="list-style-type: none"> <li>Đổi mới toàn diện, đưa đất nước ra khỏi khủng hoảng kinh tế - xã hội 1986-1996</li> <li>Tiếp tục công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế 1996-2018</li> <li>Thành tựu, kinh nghiệm của công cuộc đổi mới</li> </ol> <p>TỔNG LUẬN</p> <ol style="list-style-type: none"> <li>Những thắng lợi vĩ đại của cách mạng Việt Nam</li> <li>Những bài học lớn về sự lãnh đạo của Đảng</li> </ol>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>	

			<b>Học ngoài lớp:</b> Hoàn thiện bài thuyết trình		
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### 7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	20%	Thuyết trình và bản báo cáo nhóm	LO.3 LO.4 LO.5
2	Quiz	Bài thi giữa kỳ	Thi theo đề thi chung	30%	Tự luận	LO.1 LO.2;
3	DIC	Thảo luận tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	Cộng tối đa 1 điểm vào bài thi cuối kỳ	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Trắc nghiệm	LO.2; LO.3, LO.4;
			<b>Tổng cộng</b>	<b>100%</b>		

### 8. Tiêu chí đánh giá chuẩn đầu ra môn học

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	- Nắm được đối tượng, mục đích học tập, nghiên cứu và một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu	Chương nhập môn	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2	Hiểu rõ quá trình ra đời của Đảng Cộng sản Việt Nam (1920-1930), nội dung cơ bản, giá trị lịch sử của Cương lĩnh chính trị đầu tiên của Đảng và quá trình Đảng lãnh đạo cuộc đấu tranh giành độc lập, giành chính quyền (1930-1945)	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.3 LO.5	Nắm rõ quá trình lãnh đạo của Đảng đối với hai cuộc kháng chiến chống thực dân Pháp và đế quốc Mỹ xâm lược, hoàn thành giải phóng dân tộc, thống nhất đất nước thời kỳ 1945-1975	Chương 2	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của GV
LO.4 LO.5	Hiểu được quá trình phát triển đường lối và sự lãnh đạo của Đảng đưa cả nước quá độ lên chủ nghĩa xã hội và tiến hành công cuộc đổi mới từ sau ngày thống nhất đất nước năm 1975 đến nay. Từ đó rút ra được những thắng lợi và những bài học kinh nghiệm trong quá trình lãnh đạo cách mạng của Đảng.	Chương 3	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Ngân hàng đề của GV

### 9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn
- Quy định về Bài thuyết trình nhóm GH
- Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2. Tuần 4 thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình.



Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV

- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị cấm thi theo quy chế. Có đầy đủ điểm kiểm tra, điểm thi kết thúc học phần & nhiệt tình thảo luận, phát biểu xây dựng bài, nghiêm túc trong giờ học.

*TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2020*

**KT. TRƯỞNG KHOA  
PHÓ TRƯỞNG KHOA**



TS. Nguyễn Đình Quốc Cường

## ĐỀ CƯƠNG CHI TIẾT MÔN HỌC

### Tư tưởng Hồ Chí Minh (Ho Chi Minh's Thoughts)

<b>1. Thông tin chung</b>	
Tên môn học (tiếng Việt):	Tư tưởng Hồ Chí Minh
Tên môn học (tiếng Anh):	Ho Chi Minh's Thoughts
Mã số môn học:	PE019IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
<i>Số tiết lý thuyết:</i>	<i>20 (trên lớp)</i>
<i>Số tiết thực hành:</i>	<i>10 (trên lớp)</i>
<i>Số tiết tự học:</i>	<i>90 (về nhà)</i>
Môn học trước:	1. Triết học Mác - Lênin, 2. Kinh tế chính trị Mác - Lênin, 3. Chủ nghĩa xã hội khoa học

Giảng viên phụ trách Khoa Chính trị - Hành chính, ĐHQG-HCM

### 2. Mục đích/mục tiêu môn học (Course Purposes/Aims)

**2.1. Về kiến thức:** Trang bị cho sinh viên những kiến thức cơ bản về khái niệm, nguồn gốc, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh; những nội dung cơ bản của tư tưởng Hồ Chí Minh; sự vận dụng của Đảng Cộng sản Việt Nam trong cách mạng dân tộc dân chủ và cách mạng xã hội chủ nghĩa, trong công cuộc đổi mới đất nước hiện nay.

**2.2. Về kỹ năng:** Giúp cho sinh viên khả năng tư duy, phân tích, đánh giá, vận dụng sáng tạo tư tưởng Hồ Chí Minh vào giải quyết các vấn đề trong thực tiễn đời sống, học tập và công tác.

**2.3. Về thái độ:** Giúp sinh viên nâng cao về bản lĩnh chính trị, yêu nước, trung thành với mục tiêu, lý tưởng độc lập dân tộc gắn liền với chủ nghĩa xã hội; nhận thức được vai trò, giá trị của tư tưởng Hồ Chí Minh đối với Đảng và dân tộc Việt Nam; thấy được trách nhiệm của bản thân trong việc học tập, rèn luyện để góp phần vào xây dựng và bảo vệ Tổ quốc.

### 3. Mô tả môn học (Course Outlines)

Môn học trang bị cho sinh viên những kiến thức cơ bản về: Đối tượng, phương pháp nghiên cứu và ý nghĩa học tập môn tư tưởng Hồ Chí Minh; về cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh; về độc lập dân tộc và chủ nghĩa xã hội; về Đảng Cộng sản và Nhà nước Việt Nam; về đại đoàn kết dân tộc và đoàn kết quốc tế; về văn hóa, đạo đức, con người.

### 4. Tài liệu phục vụ học tập:

- Bộ Giáo dục và Đào tạo (2019), *Giáo trình Tư tưởng Hồ Chí Minh*, Nxb. Chính trị quốc gia, Hà Nội.

- Khoa Chính trị - Hành chính, ĐHQG-HCM, *Tài liệu hướng dẫn học tập Tư tưởng Hồ Chí Minh*

	TU TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC VÀ CHỦ NGHĨA XÃ HỘI	LO.3.1 - Nhận thức được bản chất khoa <sup>47</sup> học, cách mạng và những sáng tạo tư tưởng Hồ Chí Minh về độc lập dân tộc và cách	2.1		13
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- Hồ Chí Minh (2011), *Toàn tập*, Nxb. Chính trị quốc gia Sự thật, Hà Nội.
- Hồ Chí Minh (2016), *Biên niên tiểu sử*, Nxb. Chính trị quốc gia Sự thật, Hà Nội.

### 5. Chuẩn đầu ra môn học (Course Learning Outcomes)

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
<b>5.1. Kiến thức</b>					
LO.1	KHÁI NIỆM ĐỐI TƯỞNG PHƯƠNG PHÁP NGHIÊN CỨU VÀ Ý NGHĨA HỌC TẬP MÔN TƯ TƯỞNG HỒ CHÍ MINH	LO.1.1 - Nắm được khái niệm tư tưởng Hồ Chí Minh LO.1.2 - Nắm rõ được đối tượng nghiên cứu LO.1.3 - Nắm được một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu môn học tư tưởng Hồ Chí Minh LO.1.4 - Nắm được ý nghĩa học tập, nghiên cứu môn học tư tưởng đối với sinh viên	2.1 2.1 2.1 2.1	1.1.3	I3
LO.2	CƠ SỞ QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỂN TƯ TƯỞNG HỒ CHÍ MINH	LO.2.1 - Hiểu rõ được cơ sở thực tiễn, tiền đề lý luận và nhân tố chủ quan hình thành tư tưởng Hồ Chí Minh LO.2.2 - Hiểu rõ được quá trình hình thành và phát triển tư tưởng Hồ Chí Minh LO.2.3 - Nắm được giá trị tư tưởng Hồ Chí Minh đối với cách mạng Việt Nam và sự phát triển tiên bộ của nhân loại	2.1 2.1 2.1	1.1.3	I4

LO.3		mạng giải phóng dân tộc.	2.1	1.1.3	
		LO.3.2 - Nắm được quan điểm của Hồ Chí Minh về tính tất yếu đi lên chủ nghĩa xã hội, xây dựng chủ nghĩa xã hội và thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam.	2.1		
		LO.3.3 - Nắm được quan điểm Hồ Chí Minh về mối quan hệ giữa độc lập dân tộc và chủ nghĩa xã hội.	2.1	1.1.3	T4
		LO.3.4 - Vận dụng tư tưởng Hồ Chí Minh về độc lập dân tộc gắn liền với chủ nghĩa xã hội trong sự nghiệp cách mạng hiện nay.			
LO.4	TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẢNG CỘNG SẢN VIỆT NAM VÀ NHÀ NƯỚC CỦA NHÂN DÂN, DO NHÂN DÂN, VÌ NHÂN DÂN	LO.4.1 - Nắm được nội dung cơ bản tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt Nam.	2.1		I4
		LO.4.2 - Nắm được nội dung cơ bản tư tưởng Hồ Chí Minh về nhà nước của nhân dân, do nhân dân, vì nhân dân.	2.1	1.1.3	I4
		LO.4.3 - Vận dụng tư tưởng Hồ Chí Minh vào công tác xây dựng Đảng và xây dựng Nhà nước.	2.1		T4
LO.5	TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT TOÀN DÂN TỘC VÀ ĐẠI ĐOÀN KẾT QUỐC TẾ	LO.5.1 - Hiểu được những quan điểm cơ bản của tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc.	2.1		I4
		LO.5.2 - Hiểu được những quan điểm cơ bản của tư tưởng Hồ Chí Minh về đoàn kết quốc tế	2.1	1.1.3	
		LO.5.3 - Vận dụng tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đoàn kết quốc tế trong giai đoạn hiện nay	2.1		T4
LO.6	TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI	LO.6.1 - Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về văn hóa.	2.1		I4
		LO.6.2 - Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về đạo đức mới (đạo đức cách	2.1	1.1.3	

		mạng).			
		LO.6.3 - Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về văn hóa.	2.1		I4
		LO.6.4 - Vận dụng tư tưởng Hồ Chí Minh về văn hóa, đạo đức, con người trong việc xây dựng văn hóa, đạo đức, con người Việt Nam hiện nay.	2.1		T4
<b>5.2. Kỹ năng</b>					
LO.7	THỂ HIỆN KHẢ NĂNG TƯ DUY, PHÂN TÍCH, ĐÁNH GIÁ, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.7.1 Có kỹ năng tư duy, phân tích, đánh giá tư tưởng Hồ Chí Minh.	2.2	2.1.1 2.3.1	U4
		LO.7.2. Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn	2.2	2.4.4	
		LO.7.3. Có kỹ năng vận dụng sáng tạo tư tưởng Hồ Chí Minh vào giải quyết các vấn đề trong thực tiễn đời sống, học tập và công tác.	2.2	2.5 3.1.5	
<b>5.3. Thái Độ</b>					
LO.7	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	LO.6.1. Nhận thức được vai trò, giá trị của tư tưởng Hồ Chí Minh đối với Đảng và dân tộc Việt Nam.	2.3		U3
		LO.6.2. Có bản lĩnh chính trị, yêu nước, trung thành với mục tiêu, lý tưởng độc lập dân tộc gắn liền với chủ nghĩa xã hội	2.3	3.1	
		LO.6.3. Thấy được trách nhiệm của bản thân trong việc học tập, nghiên cứu, vận dụng trong cuộc sống, góp phần vào sự nghiệp xây dựng và bảo vệ Tổ quốc	2.3		

#### 6. Kế hoạch giảng dạy theo buổi học (Course Plan):

Buổi (3 tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1		LO.1,	<b>Dạy:</b>	
1 (tiết)	Giới thiệu về môn học	LO.5,	<ul style="list-style-type: none"> <li>- Giới thiệu đề cương môn</li> <li>- Giới thiệu nội dung đề tài thuyết trình nhóm GHW).</li> </ul>	

			<p><b>Học ở lớp:</b></p> <ul style="list-style-type: none"> <li>- Chia nhóm (5 sv/nhóm)</li> <li>- Giới thiệu nhóm học tập</li> </ul> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Chọn đề tài thuyết trình của nhóm (GHW),</li> <li>- Đọc trước tài liệu chương 1.</li> </ul>	
2	<p><b>Chương 1</b></p> <p>KHÁI NIỆM, ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ Ý NGHĨA HỌC TẬP MÔN TƯ TƯỞNG HỒ CHÍ MINH</p>	LO.1;	<p><b>Dạy:</b></p> <p>I. KHÁI NIỆM TƯ TƯỞNG HỒ CHÍ MINH</p> <p>II. ĐỐI TƯỢNG NGHIÊN CỨU MÔN HỌC TƯ TƯỞNG HỒ CHÍ MINH</p> <p>III. PHƯƠNG PHÁP NGHIÊN CỨU</p> <p>3. Phương pháp luận của việc nghiên cứu tư tưởng Hồ Chí Minh</p> <p>4. Một số phương pháp cụ thể</p> <p>IV. Ý NGHĨA CỦA VIỆC HỌC TẬP MÔN HỌC TƯ TƯỞNG HỒ CHÍ MINH</p> <p>1. Góp phần nâng cao năng lực tư duy lý luận</p> <p>2. Giáo dục và thực hành đạo đức cách mạng, củng cố niềm tin khoa học gắn liền với trau dồi tình cảm cách mạng, bồi dưỡng lòng yêu nước</p> <p>3. Xây dựng, rèn luyện phương pháp và phong cách công tác.</p> <p><b>Học ở lớp:</b> Trao đổi, phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Phác thảo nội dung thuyết trình nhóm GHW</li> <li>- Đọc trước tài liệu chương 2</li> </ul>	

3	<p><b>Chương 2</b> CƠ SỞ, QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỂN TƯ TƯỞNG HỒ CHÍ MINH</p>	LO.2	<p><b>Dạy:</b> I. CƠ SỞ HÌNH THÀNH TƯ TƯỞNG HỒ CHÍ MINH 1. Cơ sở thực tiễn 2. Cơ sở lý luận 3. Nhân tố chủ quan II. QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỂN TƯ TƯỞNG HỒ CHÍ MINH 1. Thời kỳ trước ngày 5-6-1911: Hình thành tư tưởng yêu nước và có chí hướng tìm con đường mới 2. Thời kỳ từ năm 1911 đến cuối năm 1920: Dần dần hình thành tư tưởng cứu nước, giải phóng dân tộc Việt Nam theo con đường cách mạng vô sản 3; Thời kỳ từ cuối năm 1920 đến đầu năm 1930: Hình thành những nội dung cơ bản tư tưởng về cách mạng Việt Nam 4. Thời kỳ đầu năm 1930 đến đầu năm 1941: Vượt qua thử thách, giữ vững đường lối, phương pháp cách mạng Việt Nam đúng đắn, sáng tạo 5. Thời kỳ từ đầu năm 1941 đến tháng 9 - 1969: Tư tưởng Hồ Chí Minh tiếp tục phát triển, hoàn thiện, soi đường cho sự nghiệp cách mạng của Đảng và nhân dân ta III. GIÁ TRỊ TƯ TƯỞNG HỒ CHÍ MINH 1. Đối với cách mạng Việt Nam 2. Đối với sự phát triển tiến bộ của nhân loại <b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp <b>Học ngoài lớp:</b> Đọc trước tài liệu chương 3</p>	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)
4	<p><b>Chương 3</b> TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC GẮN LIỀN VỚI CHỦ NGHĨA XÃ HỘI</p>	L0.3 L0.5	<p><b>Dạy:</b> I. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC 1. Vấn đề độc lập dân tộc 2. Về cách mạng giải phóng dân tộc <b>Dạy:</b> Châm thuyết trình &amp; phản biện <b>Học ở lớp:</b> Các nhóm thuyết trình tại lớp II. TƯ TƯỞNG HỒ CHÍ MINH VỀ CHỦ NGHĨA XÃ HỘI VÀ XÂY DỰNG CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM 1. Tư tưởng Hồ Chí Minh về chủ nghĩa xã hội</p>	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

			<p>2. Tư tưởng Hồ Chí Minh về xây dựng chủ nghĩa xã hội ở Việt Nam</p> <p>3. Tư tưởng Hồ Chí Minh về thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam</p> <p><b>III. TƯ TƯỞNG HỒ CHÍ MINH VỀ MỐI QUAN HỆ GIỮA ĐỘC LẬP DÂN TỘC VÀ CHỦ NGHĨA XÃ HỘI</b></p> <p>1. Độc lập dân tộc là cơ sở, tiền đề để tiến lên chủ nghĩa xã hội</p> <p>2. Chủ nghĩa xã hội là điều kiện để đảm bảo nền độc lập dân tộc vững chắc</p> <p><b>IV. VẬN DỤNG TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC GẮN LIỀN VỚI CHỦ NGHĨA XÃ HỘI TRONG SỰ NGHIỆP CÁCH MẠNG VIỆT NAM GIAI ĐOẠN HIỆN NAY</b></p> <p>1. Kiên định mục tiêu và con đường cách mạng mà Hồ Chí Minh đã xác định</p> <p>2. Phát huy sức mạnh dân chủ xã hội chủ nghĩa</p> <p>3. Củng cố, kiện toàn, phát huy sức mạnh và hiệu quả hoạt động của toàn hệ thống chính trị</p> <p>4. Đấu tranh chống những biểu hiện suy thoái về tư tưởng chính trị, đạo đức, lối sống và, "tự diễn biến", "tự chuyển hóa" trong nội bộ</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 4</p>	
5	<b>Chương 4</b> TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẢNG CỘNG SẢN VIỆT NAM VÀ NHÀ NƯỚC CỦA NHÂN DÂN, DO NHÂN DÂN VÀ VÌ NHÂN DÂN	LO.4 LO.5	<p><b>Dạy:</b></p> <p><b>I. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẢNG CỘNG SẢN VIỆT NAM</b></p> <p>1. Tính tất yếu và vai trò lãnh đạo của Đảng Cộng sản Việt Nam</p> <p>2. Đảng phải trong sạch, vững mạnh</p> <p><b>Dạy:</b> Châm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Thảo luận tại lớp</p> <p><b>II. TƯ TƯỞNG HỒ CHÍ MINH VỀ NHÀ NƯỚC CỦA NHÂN DÂN, DO NHÂN DÂN, VÌ NHÂN DÂN</b></p> <p>1. Nhà nước dân chủ</p> <p>2. Nhà nước pháp quyền</p> <p>3. Nhà nước trong sạch, vững mạnh</p> <p><b>III. VẬN DỤNG TƯ TƯỞNG HỒ CHÍ MINH VÀO CÔNG TÁC XÂY DỰNG ĐẢNG VÀ XÂY DỰNG NHÀ NƯỚC</b></p>	<p>Thảo luận nhóm (DIC)</p> <p>Thi cuối kỳ (FEX)</p>



			<p>1. Xây dựng Đảng thật sự trong sạch, vững mạnh</p> <p>2. Xây dựng Nhà nước</p> <p><b>Học ngoài lớp:</b> Hoàn thiện bài thuyết trình</p>	
6	<p><b>Chương 5</b></p> <p>TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ</p>		<p><b>Dạy:</b></p> <p>1. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC</p> <p>1. Vai trò của đại đoàn kết dân tộc</p> <p>2. Lực lượng của khối đại đoàn kết dân tộc</p> <p>3. Điều kiện để xây dựng khối đại đoàn kết toàn dân tộc</p> <p>4. Hình thức, nguyên tắc tổ chức của khối đại đoàn kết dân tộc - Mặt trận dân tộc thống nhất</p> <p>5. Phương thức xây dựng khối đại đoàn kết dân tộc</p> <p><b>Dạy:</b> Chấm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Thảo luận tại lớp</p> <p>II. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐOÀN KẾT QUỐC TẾ</p> <p>1. Sự cần thiết phải đoàn kết quốc tế</p> <p>2. Lực lượng đoàn kết quốc tế và hình thức tổ chức</p> <p>3. Nguyên tắc đoàn kết quốc tế</p> <p>III. VẬN DỤNG TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ TRONG GIAI ĐOẠN HIỆN NAY</p> <p>1. Quán triệt tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đoàn kết quốc tế trong hoạch định chủ trương, đường lối của Đảng</p> <p>2. xây dựng khối đại đoàn kết toàn dân tộc trên nền tảng liên minh công - nông - trí thức dưới sự lãnh đạo của Đảng</p> <p>3. Đại đoàn kết dân tộc phải kết hợp với đoàn kết quốc tế</p>	
7	<p><b>Chương 6</b></p> <p>TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI</p>		<p><b>Dạy:</b></p> <p>I. TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA</p> <p>1. Một số nhận thức chung về văn hóa và quan niệm giữa văn hóa với các lĩnh vực khác</p> <p>2. Quan điểm của Hồ Chí Minh về vai trò của văn hóa</p> <p>3. Quan điểm của Hồ Chí Minh về xây dựng nền văn hóa mới</p>	

			<p><b>Dạy:</b> Chấm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Thảo luận tại lớp</p> <p><b>II. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠO ĐỨC</b></p> <p>1. Quan điểm về vai trò và sức mạnh của đạo đức cách mạng</p> <p>2. Quan điểm về những chuẩn mực đạo đức cách mạng</p> <p>3. Quan điểm về những nguyên tắc xây dựng đạo đức cách mạng</p> <p><b>III. TƯ TƯỞNG HỒ CHÍ MINH VỀ CON NGƯỜI</b></p> <p>1. Quan niệm Hồ Chí Minh về con người</p> <p>2. Quan niệm của Hồ Chí Minh về vai trò của con người</p> <p>3. Quan niệm Hồ Chí Minh về xây dựng con người</p> <p><b>IV. XÂY DỰNG VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI VIỆT NAM HIỆN NAY THEO TƯ TƯỞNG HỒ CHÍ MINH</b></p> <p>1. Xây dựng và phát triển văn hóa, con người</p> <p>2. Về xây dựng đạo đức cách mạng</p>	
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### 7. Đánh giá môn học

ST T	Mã	Tên	Mô tả	Tỷ Trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	150%	Thuyết trình và bản báo cáo nhóm	LO.2, LO.3, LO.4, LO.5, LO.6.
2	Quiz	Bài thi giữa kỳ	Giảng viên cho thi	20%	Trắc nghiệm (đề đóng) hoặc tự luận (đề mở)	LO.2, LO.3.
3	DIC	Thảo luận tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.3, LO.4, LO.5, LO.6.

4	FEX	Thi cuối kỳ	Thi đề chung Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận (đề mở)	LO.2, LO.3, LO.4, LO.5, LO.6.
			<b>Tổng cộng</b>	<b>100%</b>		

### 8. Tiêu chí đánh giá chuẩn đầu ra môn học:

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	- Hiểu được khái niệm tư tưởng Hồ Chí Minh. - Nắm được đối tượng; phương pháp nghiên cứu tư tưởng Hồ Chí Minh và ý nghĩa học tập môn tư tưởng Hồ Chí Minh.	Chương 1	Hỏi - Đáp	Cộng điểm
LO.2	- Hiểu rõ cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh. - Nắm được giá trị tư tưởng Hồ Chí Minh đối với cách mạng Việt Nam và thế giới.	Chương 2	Thi giữa kỳ (Quiz)	Đề thi của GV
LO.3	- Nắm rõ nội dung tư tưởng Hồ Chí Minh về độc lập dân tộc và chủ nghĩa xã hội; mối quan hệ giữa độc lập dân tộc và chủ nghĩa xã hội. - Hiểu được sự vận dụng tư tưởng Hồ về độc lập dân tộc và chủ nghĩa xã hội của Đảng Cộng sản Việt Nam và Nhà nước ta.	Chương 3	Thuyết trình nhóm (GHW) Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Đề thi của GV Ngân hàng đề thi của khoa Chính trị - Hành chính
LO.4	- Nắm rõ nội dung tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt nam và Nhà nước của dân, do dân, vì dân. - Hiểu được sự vận dụng của Đảng và Nhà nước ta vào công tác xây dựng Đảng và xây dựng Nhà nước.	Chương 4	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính
LO.5	- Nắm được nội dung tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc và đoàn kết quốc tế. - Hiểu được sự vận dụng của Đảng và Nhà nước ta trong việc hoạch định chủ trương, đường lối, chính sách về đại đoàn kết dân tộc và đối ngoại.	Chương 5	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính
LO.6	- Nắm được nội dung tư tưởng Hồ Chí Minh về văn hóa, đạo đức, con người. - Vận dụng tư tưởng Hồ Chí Minh về văn hóa, đạo đức và con người trong việc rèn luyện, tu dưỡng bản thân.	Chương 6	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính

### 9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn
- Quy định về Bài thuyết trình nhóm GHW: Thành lập nhóm: 5 sinh viên/nhóm.
- + Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2.
- + Tuần 4 thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình.
- + Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV
- Quy định về đánh giá môn học: theo Quy định về việc giảng dạy và học tập các môn Lý luận chính trị của khoa Chính trị - Hành chính.

TP. Hồ Chí Minh, ngày 07 tháng 02 năm 2022

**KT.TRƯỞNG KHOA**  
**PHÓ TRƯỞNG KHOA**



TS. Nguyễn Đình Quốc Cường

# Writing AE1

## 1. General Information

- a. *Course name*
- Vietnamese: Tiếng anh chuyên ngành 1 (kĩ năng viết)
  - English: Writing AE1
- b. *Course number:*  
EN007IU
- c. *Course type:*  
General
- d. *Number of credits :* 2
- Lecture: 2
  - Laboratory: 0

## 2. Text book, title, author, and year

[1] Oshima, A., & Hogue, A. (2006). *Writing academic English* (4rd ed.) White Plains, NY: Pearson Longman. L  
SEP

### a. *other supplemental materials*

[1] Jordan, R. R. (1999). *Academic writing course* (3rd ed.). London: Collins. L  
SEP

[2] Hamp-Lyons, L., & Heasley, B. (2006). *Study writing: A course in writing skills for academic purposes* (2nd ed.). Cambridge: University Press. L  
SEP

## 3. Specific course information

### a. *brief description of the content of the course (catalog description)* L SEP

This course provides students with comprehensive instructions and practice in essay writing, including transforming ideas into different functions of writing such as process description, cause-effect, comparison-contrast, argumentative, and paraphrase-summary essays. Throughout the whole course, students are required to read university-level texts to develop the ability to read critically and to respond accurately, coherently and academically in writing. Through providing them with crucial writing skills such as brainstorming, proofreading, documentation and editing, this course prepares the students for research paper writing in the next level of AE2 writing. L  
SEP

### b. *prerequisites or co-requisites* none

### c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

This is a required course

## 4. Specific goals for the course

### a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Understand and follow different steps in the writing process to produce a complete essay
2. Use different functions of writing to successfully communicate their purposes to the audience (process description, cause-effect, comparison-contrast, argumentative, and paraphrase-summary essays)
3. Read and respond critically in writing, analyze and annotate an academic text.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1			x			
2			x			
3			x			

#### 5. Brief list of topics to be covered

- The process of Academic Writing
- From Paragraph to Essay
- Process Essays
- Cause – Effect Essays
- Comparison – Contrast Essays
- Paraphrase and Summary
- Argumentative Essays

#### 6. Assessment plan

	LO1	LO2	LO3
Assignments (30%)	x	x	x
Midterm Exam (30%)	x	x	x
Final Exam (40%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

#### 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

#### 8. Course Coordinator/Lecturer

- School/Department: Department of English
- Course Coordinator/Lecturer: MSc. Nguyen Hong Duc
- Email: nhduc@hcmiu.edu.vn

Head of English Department

Dean of School of Industrial  
Engineering and Management

  
Nguyễn Huy Cường



# Listening AE1

## 1. General Information

- a. *Course name*
- Vietnamese: Tiếng anh chuyên ngành 1 (kĩ năng nghe)
  - English: Listening AE1
- b. *Course number:*  
EN008IU
- c. *Course type:*  
General
- d. *Number of credits : 2*
- Lecture: 2
  - Laboratory: 0


## 2. Text book, title, author, and year


[1] Lecture Ready 3 – Laurie Frazie, Shalle Leming, Oxford University Press, 2007 

a. *other supplemental materials*

[1] Lecture Ready 1, 2 – Laurie Frazie, Shalle Leming, Oxford University Press 

## 3. Specific course information

a. *brief description of the content of the course (catalog description)* 

The course is designed to prepare students for effective listening and note-taking skills, so that they can pursue the courses in their majors without considerable difficulty. The course is therefore lecture-based in that the teaching and learning procedure is built up on lectures on a variety of topics such as business, science, and humanities. 

b. *prerequisites or co-requisites* none

c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

This is a required course

## 4. Specific goals for the course

a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Respond to academic lectures with appropriate strategies and confidence;
2. Improve their specialized knowledge of academic lectures;
3. Communicate effectively with their classmates and professors.

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1			x			
2			x			
3			x			

## 5. Brief list of topics to be covered

- New Trends in Marketing Research
- Business Ethics
- Trends in Children's Media Use
- The Changing Music Industry
- The Placebo Effect
- Intelligent Machines
- Sibling Relationships
- Multiple Intelligences
- The Art of Graffiti
- Design Basics

## 6. Assessment plan

	LO1	LO2	LO3
Assignments (20%)	x		x
In-class ongoing assessment (40%)	x	x	x
Final Exam (40%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

## 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

## 8. Course Coordinator/Lecturer

- School/Department: Department of English
- Course Coordinator/Lecturer: MSc. Nguyen Hong Duc
- Email: nhduc@hcmiu.edu.vn

Head of English Department

  
Nguyễn Huy Cường

Dean of School of Industrial  
Engineering and Management





# Writing AE2

## 1. General Information

- a. *Course name*
- Vietnamese: Tiếng anh chuyên ngành 2 (kĩ năng viết)
  - English: Writing AE2
- b. *Course number:*  
EN011IU
- c. *Course type:*  
General
- d. *Number of credits : 2*
- Lecture: 2
  - Laboratory: 0

## 2. Text book, title, author, and year

[1] Hamp-Lyons, L., & Heasley, B. (2006). Study writing: A course in writing skills for academic purposes (2nd ed.). Cambridge: University Press. [LSEP]

a. *other supplemental materials*

[1] Keezer, S. (ed) (2003). Write your research report. A real-time guide. New Jersey: Pearson Learning Group. [LSEP]

[2] Articles and Essays taken from The Allyn and Bacon Guide to Writing by Ramage et al (2009), Pearson Longman. [LSEP]

## 3. Specific course information

a. *brief description of the content of the course (catalog description)* [LSEP]

This course introduces basic concepts in research paper writing, especially the role of generalizations, definitions, classifications, and the structure of a research paper to students who attend English- medium college or university. It also provides them with methods of developing and presenting an argument, a comparison or a contrast. Students are required to work on the tasks selected to maximize their exposure to written communication and are expected to become competent writers in the particular genre: the research paper. [LSEP] As writing is part of an integrated skill of reading and writing where reading serves as input to trigger writing, this course is designed to familiarize non-native students with academic literature in their major study by having them read and critically respond to texts of a variety of topics ranging from natural sciences such as biology to social sciences and humanities like education, linguistics and psychology. [LSEP]

b. *prerequisites or co-requisites* Writing AE1

c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

This is a required course

## 4. Specific goals for the course

a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to

- |   |
|---|
| <ol style="list-style-type: none"> <li>1. To employ the research writing skills obtained to work on their own paper in their major study</li> <li>2. Read and respond critically in writing, analyze and annotate an academic text</li> </ol> |
|---|

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

The relationship between Course Outcomes (1-2) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1			x			
2			x			

### 5. Brief list of topics to be covered

- Analyzing the sample research paper
- Writing the introduction
- Writing the Literature Review
- Making the outline
- Writing the methodology
- Writing the conclusion
- Writing the abstract
- Guidelines for the list of references

### 6. Assessment plan

	LO1	LO2
Assignments (30%)	x	x
Midterm Exam (30%)	x	x
Final Exam (40%)	x	x

LOi: Learning Outcomes (or Course Outcomes)

### 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

### 8. Course Coordinator/Lecturer

- School/Department: Department of English
- Course Coordinator/Lecturer: MSc. Nguyen Hong Duc
- Email: nhduc@hcmiu.edu.vn

Head of English Department

  
Nguyễn Huy Cường

Dean of School of Industrial  
Engineering and Management



# Speaking AE2

## 1. General Information

- a. *Course name*
- Vietnamese: Tiếng anh chuyên ngành 2 (kĩ năng nói)
  - English: Speaking AE2
- b. *Course number:*  
EN012IU
- c. *Course type:*  
General
- d. *Number of credits : 2*
- Lecture: 2
  - Laboratory: 0

## 2. Text book, title, author, and year

[1] Effective Presentations - Jeremy Comfort, Oxford University Press, 1997 L  
SEP

a. *other supplemental materials*

[1] Study Speaking: a course in spoken English for academic purposes - By Kenneth Anderson, Joan Maclean, Tony Lynch - Cambridge University Press (2004)

L  
SEP

## 3. Specific course information

a. *brief description of the content of the course (catalog description)* L  
SEP

Giving presentations today becomes a vital skill for students to succeed not only in university but also at work in the future. However, this may be seen as a nerve-racking task, especially when presented in a foreign language. Speaking AE2 provides the students with the knowledge and skills needed to deliver effective presentations. To do this, the course covers many aspects of giving presentation: preparing and planning, using the appropriate language, applying effective visual aids, building up confidence, performing body language, dealing with questions and responding, etc. L  
SEP

b. *prerequisites or co-requisites* none

c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

This is a required course

## 4. Specific goals for the course

- a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. To prepare and deliver effective, formal, structured presentations that are appropriate to the specific environment and audience.

- b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

The relationship between Course Outcomes (1) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1			x			

### 5. Brief list of topics to be covered

- What is the Point?
- Making a Start
- Linking the Parts
- Finishing Off
- The Right Kind of Language
- Visual Aids
- Body Language
- Questions Time
- Finishing Up

### 6. Assessment plan

	LO1
Assignments (30%)	x
Midterm Exam (30%)	x
Final Exam (40%)	x

LOi: Learning Outcomes (or Course Outcomes)

### 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

### 8. Course Coordinator/Lecturer

- School/Department: Department of English
- Course Coordinator/Lecturer: MSc. Nguyen Hong Duc
- Email: nhduc@hcmiu.edu.vn

Head of English Department

Dean of School of Industrial  
Engineering and Management

  
Nguyễn Huy Cường



# Critical Thinking

## 1. General Information

- a. *Course name*
- VietNameese: Tư duy phản biện
  - English: Critical Thinking
- b. *Course number:*  
PE008IU
- c. *Course type:*  
General
- d. *Number of credits : 3*
- Lecture: 3
  - Laboratory: 0

## 2. Text book, title, author, and year

[1] Critical Thinking: A Student's Introduction, 5<sup>th</sup> edition. (Bassham, Irwin, Nardone, and Wallace), 2012. L L  
SEP SEP

[2] Critical Thinking, 12<sup>th</sup> edition (B. N. Moore, R. Parker), 2016.

- a. *other supplemental materials*  
none

## 3. Specific course information

- a. *brief description of the content of the course (catalog description)*  
Critical Thinking studies a process which is indispensable to all educated persons--the process by which we develop and support our beliefs and evaluate the strength of arguments made by others in real-life situations. It includes practice in inductive and deductive reasoning, presentation of arguments in oral and written form, and analysis of the use of language to influence thought. The course also applies the reasoning process to other fields such as business, science, law, social science, ethics, and the arts. L  
SEP
- b. *prerequisites or co-requisites* none
- c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

## 4. Specific goals for the course

- a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Apply the standards of critical thinking to evaluate arguments.
2. Understand the barriers to critical thinking and apply deductive and inductive reasoning.
3. Understand the various types of fallacies.

- b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1				x		
2			x			
3				x		

## 5. Brief list of topics to be covered

- Introduction to critical thinking
- Barriers to critical thinking
- Read Recognizing arguments<sup>L</sup><sub>SEP</sub>
- Basic logical concepts<sup>L</sup><sub>SEP</sub>
- Deductive validity
- Inductive strength
- Categorical logic<sup>L</sup><sub>SEP</sub>
- Propositional logic
- Language<sup>L</sup><sub>SEP</sub>
- Logical fallacies<sup>L</sup><sub>SEP</sub>
- Analyzing arguments<sup>L</sup><sub>SEP</sub>
- Evaluating arguments and truth claims
- Inductive reasoning
- Introduction to induction

## 6. Assessment plan

	LO1	LO2	LO3
Practice (30%)	x	x	x
Midterm Exam (30%)	x	x	x
Final Exam (40%)		x	x

## 7. Course Policy

- **Student responsibility:** Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- **Attendance:** Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- **Missed tests:** Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

## 8. Course Coordinator/Lecturer

- **School/Department:** Department of Environmental Engineering
- **Course Coordinator/Lecturer:** Dr. Pham Huynh Tram
- **Email:** phtram@hcmiu.edu.vn

Head of Department of  
Environmental Engineering



*Trần Tiến Khôi*

Dean of School of  
Industrial Engineering and Management



# Calculus 1

## 1. General Information

- a. *Course name*
- Vietnamese: Toán 1
  - English: Calculus 1
- b. *Course number:*  
MA001IU
- c. *Course type:*  
General
- d. *Number of credits :* 4
- Lecture: 4
  - Laboratory: 0

## 2. Text book, title, author, and year

[1] J. Stewart, Calculus. Concepts and Contexts, 5th ed., Thomson Learning, 2005.

a. *other supplemental materials*

[1] J. Rogawski, Calculus, Early Transcendentals 3<sup>rd</sup> edition, W.H. Freeman, 2015.

[2] R.N. Greenwell, N.P. Ritchey, and M.L. Lial, Calculus with Applications for the Life Sciences, Addition Wesley, 2003.

## 3. Specific course information

a. *brief description of the content of the course (catalog description)*

- To provide the students with the main ideas and techniques of calculus, concerning limits, continuity, differentiation and integration.
- To provide an understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life sciences
- To develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations
- To develop confidence and fluency in discussing mathematics in English.

b. *prerequisites or co-requisites*

None

c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

This is a required course.

## 4. Specific goals for the course

- a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life sciences Explain the role of a Data Science Process in data analytics.

2. Develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations
3. Develop confidence and fluency in discussing mathematics in English

b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1	x					
2	x					
3			x			

### 5. Brief list of topics to be covered

- Functions
- Limits
- Continuity
- Derivatives
- Differentiation
- Derivatives of Basic Elementary Functions
- Differentiation Rules
- Applications of Differentiation: l'Hôpital's Rule
- Optimization
- Newton's Method
- Anti-derivatives
- Indefinite Integrals
- Definite Integrals
- Fundamental Theorem of Calculus
- Techniques of Integration
- Improper Integrals
- Applications of Integration

### 6. Assessment plan

Assessment item	LO1	LO2	LO3
In-class exercises/quizzes (10%)	x	x	
Lab exercises (20%)			x



Midterm exam (30%)	x		
Final exam (40%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

### 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

### 8. Course Coordinator/Lecturer

- School/Department: Department of Mathematics
- Course Coordinator/Lecturer: Dr.Nguyen Ngoc Hai
- Email: nnhai@hcmiu.edu.vn

Vice Head of Department of  
Mathematics



Tran Vinh Linh

Dean of School of  
Industrial Engineering and  
Management



# Calculus 2

## 1. General Information

- a. *Course name*
- Vietnamese: Toán 2
  - English: Calculus 2
- b. *Course number:*  
MA003IU
- c. *Course type:*  
General
- d. *Number of credits :* 4
- Lecture: 4
  - Laboratory: 0

## 2. Text book, title, author, and year

- [1] J. Stewart, Calculus. Concepts and Contexts, 5th ed., Thomson Learning, 2005.
- a. *other supplemental materials*
- [1] J. Rogawski, Calculus, Early Transcendentals 3rd edition, W.H. Freeman, 2015.  
[2] R.N. Greenwell, N.P. Ritchey, and M.L. Lial, Calculus with Applications for the Life Sciences, Addition Wesley, 2003.

## 3. Specific course information

- a. *brief description of the content of the course (catalog description)*  
To provide the students with the main notions and techniques of calculus of functions of several variables concerning limits, continuity, differentiation and integration; basic skills of computing the sum of series. Many applications explain how to use these notions and techniques in practical situations.
- b. *prerequisites or co-requisites* Calculus 1
- c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*  
This is a required course.

## 4. Specific goals for the course

- a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life sciences Explain the role of a Data Science Process in data analytics.
2. Develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations
3. Develop confidence and fluency in discussing mathematics in English

- b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1	x					
2	x					
3			x			

## 5. Brief list of topics to be covered

- Sequence and Series
- Convergence Tests
- Power Series
- Taylor and Maclaurin Series
- Cartesian Coordinates
- Lines, Planes and Surfaces
- Derivatives and Integrals of Vector Functions
- Arc Length and Curvature
- Parametric Surfaces
- Functions of Several Variables
- Limits, Continuity, Partial Derivatives, Tangent Planes
- Gradient Vectors; Extrema
- Lagrange Multiplier
- Multiple Integrals: Double Integrals, Triple Integrals, Techniques of Integration
- Vector Fields, Line Integrals, Surface Integrals.

## 6. Assessment plan

Assessment item	LO1	LO2	LO3
In-class exercises/quizzes (10%)	x	x	
Lab exercises (20%)			x
Midterm exam (30%)	x		
Final exam (40%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

## 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

**8. Course Coordinator/Lecturer**

- School/Department: Department of Mathematics
- Course Coordinator/Lecturer: Dr.Mai Duc Thanh
- Email: mdthanh@hcmiu.edu.vn

Vice Head of  
Department of Mathematics



Tran Vinh Linh

Dean of School of Industrial  
Engineering and Management



# Physics 1

**1. Name of course:**

- English: PHYSICS 1 (GENERAL MECHANICS)
- Vietnamese: Vật lý 1

**2. Course code:** PH013IU

**3. Course type:** General

Requirement Course

Elective Course

**4. Number of credits:** 2 credits

- Theory: 2 credits
- Practice: 0 credit

**5. Prerequisite:** No

**6. Parallel teaching in the course:** No

**7. Course Description:**

An introduction to mechanics including: concepts and principles of kinetics, dynamics, energetics of motion of a particle and a rigid body.

**8. Course objectives/Course learning outcomes:**

No.	Course Objectives	Program Learning outcomes
1	Construct the basic knowledge of general Mechanics Physics	An ability to apply knowledge of mathematics, science, and engineering
2	Solve problems in engineering environment by applying both theoretical and experimental techniques	
3	Understand and acquire skills needed to use physical laws governing real process and to solve them in the engineering environment	
4	Develop confidence and fluency in discussing physics in English.	An ability to communicate effectively

**9. Textbooks and references:**

- Halliday D., Resnick R. and Walker, J. (2011) *Fundamentals of Physics*, 9<sup>th</sup> edition, John Willey and Sons, Inc.
- Alonso M. and Finn E.J. (1992) *Physics*, Addison-Wesley Publishing Company.

- Hecht, E. (2000) *Physics: Calculus*, 2<sup>nd</sup> edition, Brooks/Cole.
- Faughn/Serway (2006) *Serway's College Physics*, Thomson Brooks/Cole.

## 10. Course implementation

**Time:** 15 Weeks; 2 Periods per week

### Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Assignment

## 11. Course outline

Week	Topics	Chapter
1	<b>Motion in One Dimension</b> <ul style="list-style-type: none"> <li>- Position, Velocity, and Acceleration</li> <li>- One-Dimensional Motion with Constant Acceleration</li> <li>- Freely Falling Objects</li> </ul>	<b>Chapter 1: Bases of Kinematics</b>
2	<b>Motion in Two Dimensions</b> <ul style="list-style-type: none"> <li>- The Position, Velocity, and Acceleration Vectors</li> <li>- Two-Dimensional Motion with Constant Acceleration. Projectile Motion</li> <li>- Circular Motion. Tangential and Radial Acceleration</li> <li>- Relative Velocity and Relative Acceleration</li> </ul>	
3	<ul style="list-style-type: none"> <li>- Newton's First Law and Inertial Frames</li> <li>- Newton's Second Law</li> <li>- Newton's Third Law</li> </ul>	<b>Chapter 2: The Law of Motion</b>
4	<ul style="list-style-type: none"> <li>- Some Applications of Newton's Laws <ul style="list-style-type: none"> <li>o The Gravitational Force and Weight</li> <li>o Forces of Friction</li> <li>o Uniform Circular Motion and Non-uniform Circular Motion</li> </ul> </li> </ul>	

	<ul style="list-style-type: none"> <li>○ Motion in the Presence of Resistive Forces</li> <li>- Motion in Accelerated Frames</li> </ul>	
5	<ul style="list-style-type: none"> <li>- Work Done by Force. Power</li> <li>- Kinetic Energy and the Work.</li> <li>- Kinetic Energy Theorem</li> </ul>	<b>Chapter 3: Work and Mechanical Energy</b>
6	<ul style="list-style-type: none"> <li>- Potential Energy of a System</li> <li>- Conservation of Mechanical Energy</li> <li>- Conservative and Non-conservative Forces</li> </ul>	
7	<ul style="list-style-type: none"> <li>- Changes in Mechanical Energy for Non-conservative Forces</li> <li>- Relationship Between Conservative Forces and Potential Energy</li> </ul>	
8	<ul style="list-style-type: none"> <li>- Linear Momentum and Its Conservation</li> <li>- Impulse and Momentum</li> <li>- Collisions in One Dimension and Two Dimensional Collisions</li> </ul>	
9	<ul style="list-style-type: none"> <li>- The Center of Mass. Motion of a System of Particles</li> <li>- Rocket Propulsion</li> </ul>	
10	<ul style="list-style-type: none"> <li>- Rotational Kinematics: Rotational Motion with Constant Angular Acceleration</li> <li>- Torque and Angular Acceleration</li> <li>- Moments of Inertia</li> </ul>	<b>Chapter 5: Rotation of a Rigid Object About a Fixed Axis</b>
11	<ul style="list-style-type: none"> <li>- Rotational Kinetic Energy</li> <li>- Rolling Motion of a Rigid Object</li> <li>- Angular Momentum of a Rotating Rigid Object</li> <li>- Conservation of Angular Momentum</li> </ul>	
12	<ul style="list-style-type: none"> <li>- The Conditions for Equilibrium</li> </ul>	
13	<ul style="list-style-type: none"> <li>- The Center of Gravity</li> </ul>	

<b>14</b>	<ul style="list-style-type: none"> <li>- Newton's Law of Gravitation</li> <li>- Kepler's Laws and the Motion of Planets</li> </ul>	<b>Chapter 7: Universal Gravitation</b>
<b>15</b>	<ul style="list-style-type: none"> <li>- The Gravitational Field and Gravitational Potential Energy</li> </ul>	

**12. Course Assessment:****Grading:**

- Assignment: 30%
- Midterm Test: 30%
- Final Exam: 40%


**13. Policies:**

- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Student responsibility:* Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problem and group assignment.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students re-take the tests.)

**14. Course Coordinator/Lecturer**

- School/Department: Department of Physics
- Course Coordinator/Lecturer: Ass. Prof. Dr. Phan Bao Ngoc
- Email: pbngoc@hcmiu.edu.vn

Head of Department of Physics



Phan Bảo Ngọc

Dean of School of Industrial Engineering and Management





# Physics 2

**1. Name of course:**

- *English: PHYSICS 2 (FLUID MECHANICS AND THERMAL PHYSICS)*
- Vietnamese: Vật lý 2

**2. Course code:** PH014IU

**3. Course type:** General

Requirement Course

Elective Course

**4. Number of credits:** 2 credits

- Theory: 2 credits
- Practice: 0 credit

**5. Prerequisite:** No

**6. Parallel teaching in the course:** No

**7. Course Description:**

This course provides students with basic knowledge of fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gases and the kinetic theory of gases.

**8. Course objectives/Course learning outcomes:**

No.	Course Objectives	Program Learning outcomes
1	Construct the basic knowledge of Fluid Mechanics and Thermal Physics	An ability to apply knowledge of mathematics, science, and engineering
2	Solve problems in engineering environment by applying both theoretical and experimental techniques	
3	Understand and acquire skills needed to use physical laws governing real process and to solve them in the engineering environment	
4	Develop confidence and fluency in discussing physics in English.	An ability to communicate effectively

**9. Textbooks and references:**

**Textbooks :**

- Halliday D., Resnick R. and Walker, J. (2011) *Fundamentals of Physics*, 9<sup>th</sup> edition, John Willey and Sons, Inc.

**References:**

- Alonso M. and Finn E.J. (1992) *Physics*, Addison-Wesley Publishing Company.
- Hecht, E. (2000) *Physics: Calculus*, 2<sup>nd</sup> edition, Brooks/Cole.
- Faughn/Serway (2006) *Serway's College Physics*, Thomson Brooks/Cole.

**10. Course implementation**

**Time:** 15 Weeks; 2 Periods per week

**Teaching and learning activities**

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Assignment

**11. Course outline**

<b>Week</b>	<b>Topics</b>	<b>Chapter</b>
<b>1</b>	- Variation of Pressure with Depth	<b>Chapter 1: Fluid Mechanics</b>
<b>2</b>	- Fluid Dynamics - Bernoulli's Equation	
<b>3</b>	- Temperature and the Zeroth Law of Thermodynamics - Ideal Gas	<b>Chapter 2: Macroscopic Description of An Ideal Gas</b>
<b>4</b>	- Experimental Laws of an Ideal Gas	
<b>5</b>	- Equation of State for an Ideal Gas	
<b>6</b>	- Thermal Expansion of Solids and Liquids. - Heat and Internal Energy	<b>Chapter 3: Heat and The First Law of Thermodynamics</b>
<b>7</b>	- Heat Capacity and Specific Heat. Phase Change. Latent Heat - Heat Transfer : Convection, Conduction, and Radiation	

<b>8</b>	- Work and Heat in Thermodynamic Processes - The First Law of Thermodynamics. Some Applications.	
<b>9</b>	- Reversible and Irreversible Processes	<b>Chapter 4: Heat Engines and the Second Law of Thermodynamics</b>
<b>10</b>	- The Carnot Engine	
<b>11</b>	- Entropy. Entropy Changes in Irreversible Processes	
<b>12</b>	- Molecular Model of an Ideal Gas - Molar Specific Heat of an Ideal Gas	<b>Chapter 5: The Kinetic Theory of Gases</b>
<b>13</b>	- Adiabatic Processes for an Ideal Gas - The Equipartition of Energy	
<b>14</b>	- The Boltzmann Distribution Law - Distribution of Molecular Speeds	
<b>15</b>	- Mean Free Path - Entropy on a Microscopic Scale	

## 12. Course Assessment:

### Grading:

- Assignment: 30%
- Midterm Test: 30%
- Final Exam: 40%

## 13. Policies:

- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- *Student responsibility:* Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problem and group assignment.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely

reasonable excuses, e.g. certified paper from doctors, may students re-take the tests.)

#### 14. Course Coordinator/Lecturer

- School/Department: Department of Physics
- Course Coordinator/Lecturer: Dr. Do Xuan Hoi
- Email: dxhoi@hcmiu.edu.vn

Head of Department of Physics



Phan Bảo Ngọc

Dean of School of Industrial  
Engineering and Management



# Physics 3

## 1. Name of course:

- English: PHYSICS 3 (ELECTRICITY AND MAGNETISM)
- Vietnamese: Vật lý 3

## 2. Course code: PH015IU

## 3. Course type: General

- Requirement Course
- Elective Course

## 4. Number of credits: 3 credits

- Theory: 3 credits
- Practice: 0 credit

## 5. Prerequisite: Physics 1

## 6. Parallel teaching in the course: No

## 7. Course Description:

This course provides students with basic knowledge of electricity and magnetism.

## 8. Course objectives/Course learning outcomes:

No.	Course Objectives	Program Learning outcomes
1	Construct the basic knowledge of electricity and magnetism such as electric charge, electric potential, magnetic fields, electromagnetic waves,...	An ability to apply knowledge of mathematics, science, and engineering
2	Solve problems in engineering environment by applying both theoretical and experimental techniques	
3	Understand and acquire skills needed to use physical laws governing real process and to solve them in the engineering environment	
4	Develop confidence and fluency in discussing physics in English.	An ability to communicate effectively

## 9. Textbooks and references:

- Halliday D., Resnick R. and Walker, J. (2011) *Fundamentals of Physics*, 9<sup>th</sup> edition, John Willey and Sons, Inc.
- Alonso M. and Finn E.J. (1992) *Physics*, Addison-Wesley Publishing Company.

- Hecht, E. (2000) *Physics: Calculus*, 2<sup>nd</sup> edition, Brooks/Cole.
- Faughn/Serway (2006) *Serway's College Physics*, Thomson Brooks/Cole.

### 10. Course implementation

**Time:** 45 Weeks; 2 Periods per week

#### Teaching and learning activities

- Classroom activities: Lectures, discussions, presentations
- Self-learning: Reading, homework
- Team work: Assignment

### 11. Course outline

Week	Topics	Chapter
1	<ul style="list-style-type: none"> <li>- Properties of Electric Charges</li> <li>- Conductors and Insulators</li> <li>- Coulomb's Law</li> </ul>	<b>Chapter 1: Electric Fields</b>
2	<ul style="list-style-type: none"> <li>- The Electric Field. Electric Field Lines</li> <li>- Electric Field of a Continuous Charge Distribution</li> <li>- Electric Flux. Gauss' Law</li> </ul>	
3	<ul style="list-style-type: none"> <li>- Conductors in Electrostatic Equilibrium</li> <li>- Motion of Charged Particles in a Uniform Electric Field</li> </ul>	
4	<ul style="list-style-type: none"> <li>- Potential Difference and Electric Potential</li> <li>- Potential Difference in a Uniform Electric Field</li> <li>- Electric Potential and Potential Energy Due to Point Charges</li> <li>- Electric Potential Due to Continuous Charge Distributions</li> </ul>	<b>Chapter 2: Electric Energy and Capacitance</b>
5	<ul style="list-style-type: none"> <li>- Electric Potential of a Charged Isolated Conductor</li> <li>- Capacitance. Combinations of Capacitors</li> </ul>	

	<ul style="list-style-type: none"> <li>- Energy Stored in a Charged Capacitor</li> <li>- Capacitors with Dielectrics</li> </ul>	
<b>6</b>	<ul style="list-style-type: none"> <li>- Electric Current</li> <li>- Resistance and Ohm's Law</li> <li>- A Model for Electrical Conduction</li> </ul>	<b>Chapter 3 Current and Resistance. Direct Current Circuits</b>
<b>7</b>	<ul style="list-style-type: none"> <li>- Resistance and Temperature</li> <li>- Superconductors</li> <li>- Electrical Energy and Power</li> </ul>	
<b>8</b>	<ul style="list-style-type: none"> <li>- Electromotive Force</li> <li>- Resistors in Series and in Parallel</li> <li>- Kirchhoff's Rules</li> <li>- <i>RC</i> Circuits</li> </ul>	
<b>9</b>	<ul style="list-style-type: none"> <li>- The Magnetic Field</li> <li>- Magnetic Force Acting on a Current-Carrying Conductor</li> <li>- Torque on a Current Loop in a Uniform Magnetic Field</li> <li>- Motion of a Charged Particle in a Uniform Magnetic Field</li> <li>- The Hall Effect</li> <li>- The Biot-Savart Law</li> <li>- Ampère's Law</li> </ul>	
<b>10</b>	<ul style="list-style-type: none"> <li>- The Magnetic Field of a Solenoid</li> <li>- Magnetic Flux. Gauss's Law in Magnetism</li> <li>- Displacement Current and the General Form of Ampère's Law</li> <li>- Magnetism in Matter</li> <li>- The Magnetic Field of the Earth</li> <li>- Motional emf</li> <li>- Lenz's Law</li> </ul>	
<b>11</b>	<ul style="list-style-type: none"> <li>- <b>Faraday's Law of Induction</b></li> </ul>	

	<ul style="list-style-type: none"> <li>- <b>Induced emf and Electric Fields</b></li> <li>- <b>Self-Inductance</b></li> </ul>	<b>Chapter 5: Electromagnetic Induction</b>
<b>12</b>	<ul style="list-style-type: none"> <li>- <i>RL</i> Circuits</li> <li>- Energy in a Magnetic Field</li> <li>- Mutual Inductance</li> </ul>	
<b>13</b>	<ul style="list-style-type: none"> <li>- AC Sources and Phasors</li> <li>- Resistors in an AC Circuit</li> <li>- Inductors in an AC Circuit</li> <li>- Capacitors in an AC Circuit</li> </ul>	<b>Chapter 6: Alternating-Current Circuits</b>
<b>14</b>	<ul style="list-style-type: none"> <li>- The <i>RLC</i> Series Circuit</li> <li>- Power in an ac Circuit</li> <li>- Resonance in a Series RLC Circuit</li> <li>- The Transformer and Power Transmission</li> </ul>	
<b>15</b>	<ul style="list-style-type: none"> <li>- Maxwell's Equations and Hertz's Discoveries</li> <li>- Plane Electromagnetic Waves</li> <li>- Energy Carried by Electromagnetic Waves</li> <li>- Momentum and Radiation Pressure</li> <li>- Production of Electromagnetic Waves by an Antenna</li> <li>- The Spectrum of Electromagnetic Waves</li> </ul>	<b>Chapter 7: Electromagnetic Waves</b>

**12. Course Assessment:****Grading:**

- Assignment: 30%
- Midterm Test: 30%
- Final Exam: 40%

**13. Policies:**

- *Attendance:* Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.



- *Student responsibility:* Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problem and group assignment.
- *Missed tests:* Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students re-take the tests.)

#### **14. Course Coordinator/Lecturer**

- School/Department: Department of Physics
- Course Coordinator/Lecturer: Ass. Prof. Dr. Phan Bao Ngoc
- Email: pbngoc@hcmiu.edu.vn

Head of Department of Physics



Phan Bao Ngoc

Dean of School of Industrial  
Engineering and Management



# Chemistry Laboratory

## 1. General Information

- a. *Course name*
- Vietnamese: Thực hành hoá học
  - English: Chemistry Laboratory
- b. *Course number:*  
CH012IU
- c. *Course type:*  
General
- d. *Number of credits : 1*
- Lecture: 0
  - Laboratory: 1

## 2. Text book, title, author, and year

- [1] “General Chemistry” by Darrell Ebbing and Steven D. Gammon (9th Ed., 2010)  
 [2] “Chemistry: A Molecular Approach” by Nivaldo J. Tro (2nd Ed., 2008)  
 [3] “Chemistry, Principles and Reactions” by Masterton and Hurley (6th Ed., 2009)

- a. *other supplemental materials*  
none

## 3. Specific course information

- a. *brief description of the content of the course (catalog description)*  
 This course is designed for non-chemistry majors, as it is intended for students pursuing a degree in information technology, electronic and telecommunication. The course introduces the lab-work with emphasis on techniques relevant to engineering in chemistry.
- b. *prerequisites or co-requisites*  
None
- c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*  
 This is a required course.

## 4. Specific goals for the course

- a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Be able to demonstrate lab skills and basic knowledge of the following
  - Chemical reactions
  - pH and buffers
  - Oxidation-Reduction titration with  $\text{KMnO}_4$
  - Chemical equilibrium
  - Factors affecting reaction rates

- b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

The relationship between Course Outcomes (1) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1						x

### 5. Brief list of topics to be covered

- Laboratory orientation
- Expt. 01 - Chemical Reactions
- Expt. 02- pH and buffers
- Expt. 03 - Redox Titration with  $\text{KMnO}_4$
- Expt. 04 - Chemical Equilibrium
- Expt. 05 - Factors affecting reaction rates

### 6. Assessment plan

Assessment item	LO1
Prelab (20%)	x
Reports (50%)	x
Final exam (30%)	x

LOi: Learning Outcomes (or Course Outcomes)

### 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

### 8. Course Coordinator/Lecturer

- School/Department: School of Biotechnology
- Course Coordinator/Lecturer: Dr. Huynh Kim Lam
- Email: hklam@hcmiu.edu.vn

Dean of School of Biotechnology

Nguyễn Văn Thuận

Dean of School of Industrial  
Engineering and Management

# Chemistry for Engineer

## 1. General Information

- a. *Course name*
- Vietnamese: Hoá học cho kỹ sư
  - English: Chemistry for Engineer
- b. *Course number:*  
CH011IU
- c. *Course type:*  
General
- d. *Number of credits : 3*
- Lecture: 3
  - Laboratory: 0

## 2. Text book, title, author, and year

- [1] Chemistry for Engineers – An Applied Approach by Mary Jane Shultz, 2007.  
 [2] General Chemistry” by Darrell Ebbing and Steven D. Gammon, 9th Ed., 2010.  
 [3] Chemistry: A Molecular Approach by Nivaldo J. Tro, 2nd Ed., 2008.  
 [4] Chemistry, Principles and Reactions by Masterton and Hurley, 6th Ed., 2009.

a. *other supplemental materials*

none

a. *brief description- of the content of the course (catalog description)*

This one- semester course is designed for engineering students those who -are pursuing a non chemistry engineering degree such as information technology, bio technology, civil, biomedical, electronic and telecommunication engineering. The course will introduce the basic principles of chemistry- and connect those principles to issues in engineering professions. The related lab work is not included in this course.

b. *prerequisites or co-requisites*

None

c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

This is a required course. **3. Specific course information**

## 4. Specific goals for the course

- a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Demonstrate basic knowledge of the following:

- The role of chemistry for engineers [L] [SEP]
- Measurements in chemistry [L] [SEP]
- Matter and state of matter [L] [SEP]
- Structure of atoms, molecules and ions [L] [SEP]
- Periodicity [L] [SEP]

- Chemical bonds L  
SEP
  - Intermolecular forces, liquid and solid L  
SEP
  - Gases, liquids, solids and their properties L  
SEP
  - Types and rates of chemical reactions L  
SEP
  - Chemical equilibrium L  
SEP
  - Electrolytes, acid-base, pH, buffer L  
SEP
  - Thermochemistry and thermodynamics L  
SEP
  - Electrochemistry L  
SEP
2. Development of their critical thinking and problem-solving skills for applying chemistry in an engineering context L  
SEP
  3. Ability to explain many aspects of everyday life using chemistry concepts L  
SEP

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1	x					
2	x					
3						x

## 5. Brief list of topics to be covered

- Introduction to General Chemistry for Engineers
- Measurements in Chemistry
- Introduction to Matter
- Atoms, Molecules and Ions
- Periodicity
- Chemical Bonds
- Intermolecular Forces
- Gases and Their Properties
- Solutions and Their Properties
- Solids and Their Properties
- Chemical Reactions
- Chemical Kinetics
- Chemical Equilibrium
- Electrolytes, Acid Base, pH and Buffer
- Thermochemistry and Thermodynamics
- Electrochemistry
- Nuclear Chemistry

## 6. Assessment plan

Assessment item	LO1	LO2	LO3
Lab exercises (20%)			x
Midterm exam (30%)	x		

Final exam (50%)		x	x
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LOi: Learning Outcomes (or Course Outcomes)

### 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

### 8. Course Coordinator/Lecturer

- School/Department: School of Biotechnology
- Course Coordinator/Lecturer: Dr. Huynh Kim Lam
- Email: hklam@hcmiu.edu.vn

Dean of School of Biotechnology



Nguyễn Văn Thuận

Dean of School of Industrial  
Engineering and Management



# Calculus 3

## 1. General Information

- a. *Course name*
- Vietnamese: Toán 3
  - English: Calculus 3
- b. *Course number:*  
MA023IU
- c. *Course type:*  
General
- d. *Number of credits : 4*
- Lecture: 4
  - Laboratory: 0

## 2. Text book, title, author, and year

- [1] G. James, Advanced Modern Engineering Mathematics, 3rd ed., Prentice Hall, 2004.
- a. *other supplemental materials*
- [1] E. Kreyszig, Advanced Engineering Mathematics, 9th ed., John Wiley & Sons, 2006.
- [2] 2. R.C. Drof, J. A. Svoboda, Introduction to Electric Circuits, 6th ed., John Weley & Sons, 2004.
- [3] J.W. Nilsson and S.A. Riedel, Electric Circuits, 7th Ed, Prentice Hall, 2005.
- [4] J.H. McClellan, R.W. Schafer, M.A, Yoder, Signal Processing First, Prentice Hall, 2003.
- [5] A.V. Oppenheim, A.S. Willsky, Signals & Systems, 2nd ed., Prentice Hall, 1997.
- [6] B.P. Lathi, Linear Systems and Signals, Oxford University Press, 2005.

## 3. Specific course information

- a. *brief description of the content of the course (catalog description)*

To give the students:

- Knowledge of complex numbers and series, complex functions, and complex derivatives
  - Knowledge of Laplace transforms, z-transforms, Fourier series and Fourier transforms, Fourier spectrum, frequency response, etc.
  - Mathematical and computational skills needed in solving differential equations and in fields such as electric circuits, communications, signal processing and control, etc.
  - To develop confidence and fluency in discussing mathematics in English.
- b. *prerequisites or co-requisites*  
Calculus 1, Calculus 2

- c. *indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

This is a required course.

#### 4. Specific goals for the course

- a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

Upon the successful completion of this course students will be able to:

1. Understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life sciences Explain the role of a Data Science Process in data analytics.
2. Develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations
3. Develop confidence and fluency in discussing mathematics in English

- b. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

The relationship between Course Outcomes (1-3) and Student Outcomes (1-6) is shown in the following table:

	1	2	3	4	5	6
1	x					
2	x					
3			x			

#### 5. Brief list of topics to be covered

- Complex numbers
- Complex series
- Complex functions
- Complex derivatives
- Laplace transform
- z-transform
- Fourier series, Fourier transform
- The inverse transform
- Transforms of derivatives and integrals
- First-order differential equations
- Second-order differential equation
- Difference equations
- Applications to electrical circuits and signal processing.

#### 6. Assessment plan



Assessment item	LO1	LO2	LO3
Assignment exercises (20%)			x
Midterm exam (20%)	x		
Final exam (60%)		x	x

LOi: Learning Outcomes (or Course Outcomes)

## 7. Course Policy

- Student responsibility: Students are expected to spend at least 8 hours per week for self – studying. This time should be made up of reading, working on exercises and problems and group assignment.
- Attendance: Regular on-time attendance in this course is expected. It is compulsory that students attend at least 80% of the course to be eligible for the final examination.
- Missed tests: Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, students may re-take the tests.)

## 8. Course Coordinator/Lecturer

- School/Department: Department of Mathematics
- Course Coordinator/Lecturer: Dr. Nguyen Ngoc Hai
- Email: nnhai@hcmiu.edu.vn

Vice Head of  
Department of Mathematics



Tran Vinh Linh

Dean of School of Industrial  
Engineering and Management



## SYLLABUS

### APPLIED LINEAR ALGEBRA

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#### 1. General Information

Course Title	
+ Vietnamese	<i>Ứng dụng đại số tuyến tính</i>
+ English	Applied Linear Algebra
Course ID	MA027IU
Course level	<input checked="" type="checkbox"/> Undergrad <input type="checkbox"/> Master <input type="checkbox"/> Both
Course type	<input checked="" type="checkbox"/> General <input type="checkbox"/> Fundamental <input type="checkbox"/> Specialization (required) <input type="checkbox"/> Specialization (elective) <input type="checkbox"/> Project/Internship/Thesis <input type="checkbox"/> Others: <u>.....</u>
Number of credits	<b>2</b>
+ Lecture	2
+ Laboratory	Nil
Prerequisites	Calculus 1
Parallel Course	Nil
Course it replaces	
Course standing in curriculum	Year 2 ISE undergraduate program (see curriculum mapping in student handbook)

#### 2. Course Description

- Systems of linear equations, Matrices in echelon form, Gauss elimination method, Algebra of matrices, Determinants and their properties, Vector Spaces, Linear independence, Basis, Rank of a matrix, Linear transformation, Inner product spaces, Eigenvalues and Eigenvectors.

#### 3. Textbooks and references

##### Textbooks:

R.O. Hill, Elementary linear algebra with applications, 3rd edition, Thomson, 2006.

E. Kreyszig, Advanced Engineering Mathematics, 9th edition, John Wiley & Sons, 2006

#### Reference Materials:

#### 4. Course Objectives

- To provide the students with the main ideas of the basic theory of linear equation and matrix
- To study applications of algebra matrixes and linear equation through practical examples taken from many areas of engineering, business, social sciences, etc.
- To develop the ability to construct and analyze mathematical models based on algebra matrixes and linear equation.

#### 5. Learning Outcomes

Learning outcome codes	Course learning outcome descriptions	Program Learning outcomes after ABET
G1	To provide the main ideas and techniques of calculus, concerning linear equations, Matrices in echelon form, their properties.	(a)
G2	To provide an understanding of the practical meaning, significance and applications of these ideas and techniques, through practical examples taken from many areas of engineering, business and the life science.	(a)
G3	To develop skills in mathematical modelling and problem solving, in thinking logically, and in creatively applying existing knowledge to new situations	(a), (e), (k)
G4	To develop confidence and fluency in discussing mathematics in English.	(g), (i)

(\*) Refer to ABET student outcomes

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams

- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## 6. Course Assessment

Assessment component	Assessment form	Percentage %
<b>Lecture</b>		
A1. Process assessment	A1.1 Quiz	10%
	A1.2 Homework	10%
A2. Midterm assessment	A2.1 Mid-term Exam	20%
A3. Final assessment	A3.1 Final exam	60%

## 7. Course Outline

Week/ Class	Content	Learning outcomes	Teaching and learning activities	Assessment
1	<b>Chapter 1. Introduction to linear equations and matrices</b> 1.1. Gauss elimination 1.2. The algebra of matrices	G1, G2, G3	in class	A1.1 A1.2
2&3	<b>Chapter 1. Introduction to linear equations and matrices (cont)</b> 1.3. Inverse matrices 1.4. Transpose-symmetric matrices	G1, G2, G3		

4&5	<b>Chapter 2. Determinants</b> 2.1 The Determinant of a Matrix 2.2 Evaluation of a Determinant using Elementary Operations	G1, G2, G3	in class	A1.1 A1.2
6&7	<b>Chapter 2. Determinants (cont)</b> 2.1 The Determinant of a Matrix 2.2 Evaluation of a Determinant using Elementary Operations	G1, G2, G3	in class	A1.1 A1.2
8	Review		in class	A1.1 A1.2
	<b>Midterm exam</b>			A2.1
9	<b>Chapter 3. Vector spaces</b> 3.1 Euclidean n-spaces 3.2 General vector spaces	G1, G2, G3	in class	A1.1 A1.2
10	<b>Chapter 3. Vector spaces (cont)</b> 3.3 Subspaces, span, null spaces 3.4 Linear independence			
11	<b>Chapter 3. Vector spaces (cont)</b> 3.5 Basis and Dimension 3.6 Rank of a matrix			
12	<b>Chapter 4. Linear Transformation, Inner product spaces, Eigenvalues and eigenvectors</b> 4.1 Linear transformation 4.2 Inner product spaces	G1, G2, G3	in class	A1.1 A1.2
13	<b>Chapter 4. Linear Transformation, Inner product spaces, Eigenvalues and eigenvectors (cont)</b> 4.3 Eigenvalues and eigenvectors 4.4 Diagonalization	G1, G2, G3	in class	A1.1 A1.2
14	Review	G1, G2, G3	in class	A1.1 A1.2
14	Review	G1, G2, G3	in class	A1.1 A1.2
	<b>Final exam</b>			A3.2

## 8. Course Policy

**Class Participation:** A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

**Academic Honesty and Plagiarism:** Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

## 9. Course Coordinator/Lecturer

- Department of Industrial & Systems Engineering, Room: O2-602
- Course Coordinator/Lecturer: Mathematics Department
- Email:

Vice Head of  
Department of Mathematics



Tran Vinh Linh

Dean of School of Industrial Engineering  
and Management





# VIETNAM NATIONAL UNIVERSITY HCMC INTERNATIONAL UNIVERSITY

## COURSE SYLLABUS

### General Law

#### PE021IU

#### 1. General information

<b>Department</b>	Office of Academic Affairs
<b>Course classification</b>	Foundation course
<b>Course designation</b>	Face to face
<b>Semester(s) in which the course is taught</b>	All semesters in each academic year
<b>Person responsible for the course</b>	Dr. Vo Tuong Huan LLM. Bui Doan Danh Thao
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Student-centred approach
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 60 Contact hours (lecture, in class discussions): 45 hours Private study including examination preparation, specified in hours <sup>1</sup> : 15
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	N/A

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	<p>The overarching aims of this course are to:</p> <ul style="list-style-type: none"> <li>• Provide essential knowledge of Vietnamese legal system through integrated technology and real cases for social and cultural sustainability.</li> <li>• Raise awareness of responsibility toward others and how to stand for ending all types of legal violations, <b>especially corruption in various social contexts</b>.</li> <li>• Practice necessary skills to act as an ambassador to ensure social fairness and global equitable rights.</li> <li>• Use integrated online legal resources and communication tools to help the community to identify issues and develop countermeasures.</li> </ul>								
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course, students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>           CLO1. Apply appropriate legal knowledge in the Vietnamese legal system to solve legal issues in <b>various social contexts</b> for a fair sustainable lifelong being.            CLO1.1. Apply general knowledge on state and law to solve legal issues in <b>various social contexts</b> for a fair sustainable lifelong being.            CLO1.2. Apply principle legal norms in some law branches such as constitution, civil, criminal, labor and administrative law to solve legal issues in <b>various social contexts</b> for a fair sustainable lifelong being.         </td> </tr> <tr> <td>Skill</td> <td>           CLO2. Communicate knowledge in the Vietnamese legal system to encourage people to raise their legal rights aiming for fair social/cultural moves.            CLO3. Integrate ICTs to solve legal issues in <b>various social contexts</b>.         </td> </tr> <tr> <td>Attitude</td> <td>           CLO4. Detect the responsibility to ensure social and cultural fairness, <b>including ending corruption</b>, in <b>various social contexts</b> through understanding importance of law in social contexts.            CLO5. Respond to the base for coexistence in <b>various social contexts</b>.         </td> </tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	Knowledge	CLO1. Apply appropriate legal knowledge in the Vietnamese legal system to solve legal issues in <b>various social contexts</b> for a fair sustainable lifelong being. CLO1.1. Apply general knowledge on state and law to solve legal issues in <b>various social contexts</b> for a fair sustainable lifelong being. CLO1.2. Apply principle legal norms in some law branches such as constitution, civil, criminal, labor and administrative law to solve legal issues in <b>various social contexts</b> for a fair sustainable lifelong being.	Skill	CLO2. Communicate knowledge in the Vietnamese legal system to encourage people to raise their legal rights aiming for fair social/cultural moves. CLO3. Integrate ICTs to solve legal issues in <b>various social contexts</b> .	Attitude	CLO4. Detect the responsibility to ensure social and cultural fairness, <b>including ending corruption</b> , in <b>various social contexts</b> through understanding importance of law in social contexts. CLO5. Respond to the base for coexistence in <b>various social contexts</b> .
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>								
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Skill	CLO2. Communicate knowledge in the Vietnamese legal system to encourage people to raise their legal rights aiming for fair social/cultural moves. CLO3. Integrate ICTs to solve legal issues in <b>various social contexts</b> .								
Attitude	CLO4. Detect the responsibility to ensure social and cultural fairness, <b>including ending corruption</b> , in <b>various social contexts</b> through understanding importance of law in social contexts. CLO5. Respond to the base for coexistence in <b>various social contexts</b> .								
<b>Content</b>	<p>The course will introduce students to Vietnamese legal systems. In particular, students will understand their rights and obligations in the Constitution, Criminal law, administrative law, civil law, labor law and enterprise law of Vietnam. From this, students will raise awareness towards their responsibility to ensure justice, <b>including ending corruption</b>, in society.</p>								
<b>Examination forms</b>	<p>Multiple choice questions            Case-based exams            Essay exams            Oral exams</p>								



<b>Study and examination requirements</b>	<p>To pass this course, the students must:</p> <ul style="list-style-type: none"> <li>• Achieve a composite mark of at least 50; and</li> <li>• Make a satisfactory attempt at all assessment tasks (see below).</li> </ul> <p><b>GRADING POLICY</b></p> <p>Grades can be based on the following:</p> <table border="1"> <tr> <td>Assignment</td> <td>20%</td> </tr> <tr> <td>Midterm examination</td> <td>30%</td> </tr> <tr> <td>Final examination</td> <td>50%</td> </tr> <tr> <td><b>Total</b></td> <td><b>100%</b></td> </tr> </table> <p><b>COURSE POLICIES</b></p> <p><b>Attendance</b></p> <p>Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on eligible medical grounds.</p> <p><b>Workload</b></p> <p>It is expected that the students will spend at least <i>six</i> hours per week studying this course. This time should be made up of reading, research, working on exercises and problems, and attending classes. In periods where they need to complete assignments or prepare for examinations, the workload may be greater.</p> <p>Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities.</p> <p><b>General Conduct and Behaviour</b></p> <p>The students are expected to conduct themselves with consideration and respect for the needs of fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. The use of laptops is also encouraged during law lessons only to search for materials online. More information on student conduct is available on <a href="#">the university webpage</a>.</p> <p><b>Keeping informed</b></p> <p>The students should take note of all announcements made in lectures or on the course's Blackboard, and another announced mean of communications. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.</p> <p><b>Academic honesty and plagiarism</b></p> <p>Plagiarism is the presentation of the thoughts or work of another as one's own. Students are also reminded that careful time management is an important part of the study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and</p>	Assignment	20%	Midterm examination	30%	Final examination	50%	<b>Total</b>	<b>100%</b>
	Assignment	20%							
Midterm examination	30%								
Final examination	50%								
<b>Total</b>	<b>100%</b>								

	<p>the proper referencing of sources in preparing all assessment items. The university regards plagiarism as a form of academic misconduct and has very strict rules regarding plagiarism.</p> <p><b>Special consideration</b></p> <p>Requests for special consideration (for final examination only) must be made to the Office of Academic Affairs within one week after the examination. General policy and information on special consideration can be found at the Office of Academic Affairs. Absence on the Mid-term is not allowed, or in special cases approved by Lecturer can be replaced with relevant Assignment.</p> <p><b>Meeting up with the lecturers after classes</b></p> <p>Students must make an appointment via emails if they want to meet up with the lecturer after classes and be on time. If there are any changes to the scheduled time, students must inform the lecturer immediately.</p>
<b>Reading list</b>	<p>Please note that it is very important to gain familiarity with the subject matter in the readings and cases available on Blackboard and the internet <i>before</i> attendance in classes.</p> <p><b>Required Course Texts and Materials</b></p> <p><u>Legal Texts:</u></p> <ol style="list-style-type: none"> <li>1. Constitution of Vietnam - 2013</li> <li>2. Civil Code of Vietnam - 2015</li> <li>3. Criminal Code of Vietnam – 2015 (amended in 2017)</li> <li>4. Law on Law on Handling of Administrative Violations 2012</li> <li>5. Law on Enterprises – 2020</li> <li>6. Labour Code 2019</li> <li>7. Law on anti-corruption 2018</li> </ol> <p>Available at <a href="https://luatvietnam.vn/">https://luatvietnam.vn/</a> or <u>Blackboard</u></p> <p><u>Books:</u></p> <ul style="list-style-type: none"> <li>• PGS.TS. Phan Trung Hien, <i>Giáo trình Pháp Luật Đại cương</i>, NXB Chính Trị Quốc Gia Sự Thật 2022.</li> <li>• Mai Hong Quy (Chief Editor) (2<sup>nd</sup> 2017), <i>Introduction to Vietnamese Law</i>, Hong Duc Publishing House.</li> </ul> <p><u>Additional materials provided in Blackboard</u></p> <p>The lecturer will attempt to make lecture notes and additional reading available on Blackboard. However, this is not an automatic entitlement for students doing this subject. Note that this is not a distance learning course, and you are expected to attend lectures and take notes. This way, you will get the added benefit of class interaction and demonstration.</p> <p><b>Optional Course Texts and Materials</b></p> <p><u>Recommended Internet sites</u></p> <p><a href="#">UNCTAD</a> (United Nations Conference on Trade and Development)</p> <p><a href="#">WTO</a> (World Trade Organization)</p> <p><a href="#">MOIT - Vietnam</a> (Official website of Ministry of Industry and Trade)</p> <p><a href="#">MPI - Vietnam</a> (Official website of Ministry of Planning and Investment)</p>

	<p><b>Other Resources, Support and Information</b></p> <p>Additional learning assistance is available for students in this course and will be made available on Blackboard. Academic journal articles are available through connections via the <a href="#">VNU - Central Library</a>. Recommended articles will be duly informed to the students.</p> <p><b>Books:</b></p> <ul style="list-style-type: none"> <li>• Nguyen Phu Trong, <i>Kiên quyết, kiên trì đấu tranh phòng, chống tham nhũng, tiêu cực, góp phần xây dựng đảng và nhà nước ta ngày càng trong sạch, vững mạnh</i>, NXB Chính Trị Quốc Gia Sự Thật 2023.</li> <li>• University of Law Ho Chi Minh City, <i>Giáo trình luật Hiến pháp Việt nam</i>, NXB Hồng Đức 2023.</li> <li>• University of Law Ho Chi Minh City, <i>Giáo trình Luật hành chính</i>, NXB Hồng Đức 2022.</li> <li>• University of Law Ho Chi Minh City, <i>Giáo trình Luật hình sự Việt Nam</i>, NXB Hồng Đức 2022.</li> <li>• University of Law Ho Chi Minh City, <i>Giáo trình Luật dân sự Việt Nam</i>, NXB Hồng Đức 2022.</li> <li>• University of Law Ho Chi Minh City, <i>Giáo trình Luật lao động Việt Nam</i>, NXB Hồng Đức 2022.</li> <li>• University of Law Ho Chi Minh City, <i>Giáo trình pháp luật về chủ thể kinh doanh</i>, NXB Hồng Đức 2022.</li> </ul>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (SLO) (1-5) and Program/Student Learning Outcomes (PLO/SLO) (1 - 10) is shown in the following table:

SLO	PLO/SLO									
	1	2	3	4	5	6	7	8	9	10
1	R,M					R,M	R,M	R,M	R,M	R,M
2			R,M							
3			R,M							
4				R,M						
5					R,M					

*R: Reinforced*

*M: Mastery*

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	<b>Introduction to State</b> <ul style="list-style-type: none"> <li>• What is State?</li> <li>• Nature of state</li> <li>• Forms of state</li> <li>• Functions of state</li> <li>• Introduction to structure of Vietnamese state</li> </ul>	1-5 (level I - introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT - Introduction to Vietnamese legal system available on Blackboard

2	<p><b>Introduction to law?</b></p> <ul style="list-style-type: none"> <li>• What is law?</li> <li>• Nature of law</li> <li>• Forms of law</li> <li>• Structure of law</li> <li>• Categorization of legal system.</li> <li>• Enforcement</li> <li>• Breach of law and liabilities for breach of law</li> <li>• Introduction to structure of Vietnamese legal system</li> </ul>	1-5 (level I - introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT - Introduction to Vietnamese legal system available on Blackboard
3	<p><b>Constitutional Law</b></p> <ul style="list-style-type: none"> <li>• General introduction on Vietnamese Constitution and its nature and basic principles.</li> <li>• Political, economic and other regimes of Vietnam</li> <li>• Basic rights and responsibilities of citizens. Relationship between citizens and the State.</li> <li>• Structure, functions and duties of Vietnamese state, especially in prevention of corruption</li> </ul>	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPTs – Constitutional law available on Blackboard  Constitution 2013 available on Blackboard
4	<p><b>Constitutional Law (Cont)</b></p> <ul style="list-style-type: none"> <li>• Structure and functions and duties of Vietnamese state</li> <li>• Duties of the state in prevention of corruption</li> </ul>	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPTs – Constitutional law available on Blackboard  Constitution 2013 available on Blackboard
5	<p><b>Administrative Law</b></p> <ul style="list-style-type: none"> <li>• Definition and nature of administrative law</li> <li>• Administrative law violations</li> <li>• Liabilities for breach of administrative law, exemption from the liability</li> </ul>	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies and law on anti-corruption	PPT– Administrative law available on Blackboard  Law on handling administrative violations 2012, and Law on anti-corruption 2018 available on Blackboard
6	<p><b>Criminal Law</b></p> <ul style="list-style-type: none"> <li>• Definition and nature of criminal law</li> </ul>	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance	Discussions Case studies, especially cases related	PPT– Criminal law available on Blackboard

	<ul style="list-style-type: none"> <li>Crimes</li> <li>Punishments</li> </ul>		evaluations	to corruption	Criminal code 2015 available on Blackboard
7	<b>Criminal Law (Cont)</b> <ul style="list-style-type: none"> <li>Crimes related to corruption</li> <li>Punishments for corruption</li> </ul>	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies, especially cases related to corruption	PPT– Criminal law available on Blackboard  Criminal code 2015 available on Blackboard
8	<b>Revision for mid-term exam</b>		Quizzes Projects		
9	<b>Civil Law (Part I)</b> <ul style="list-style-type: none"> <li>Definition and nature Civil law relationship</li> <li>Subject of civil law</li> <li>Property and ownership</li> <li>Civil transactions</li> </ul>	1-5 (Level R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard  Civil code 2015 available on Blackboard
10	<b>Civil Law (Part II)</b> <ul style="list-style-type: none"> <li>Contracts</li> <li>Definitions</li> <li>Formation of contracts</li> <li>Validity of contracts</li> <li>Liability for breach of contracts</li> </ul>	1-5 (Level M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard  Civil code 2015 available on Blackboard
11	<b>Civil Law (Part III)</b> <ul style="list-style-type: none"> <li>Inheritance</li> <li>Testamentary inheritance</li> <li>Intestacy</li> </ul>	1-5 (Level M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard  Civil code 2015 available on Blackboard
12	<b>Law on Enterprises</b> <ul style="list-style-type: none"> <li>Introduction to law on enterprises</li> <li>Introduction to forms, features, establishment, reorganization and dissolution of an enterprise</li> </ul>	1-5 (Level I - Introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Law on enterprises available on Blackboard  Law on enterprises 2020 available on Blackboard
13	<b>Labor Law</b> <ul style="list-style-type: none"> <li>Definition, and nature of labour law</li> <li>Employees and employers</li> <li>Working time, and resting time</li> <li>Salary (including salary for overtime working hours)</li> </ul>	1-5 (Level M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Labor law available on Blackboard  Labor code 2019 available on Blackboard
14	<b>Labour Law (Cont.)</b>	1-5 (Level M -	Tests Peer evaluations	Discussions Case studies	PPT– Labor law available on

	<ul style="list-style-type: none"> <li>• Employment contracts</li> <li>• Labor disciplines</li> <li>• Dispute settlements</li> </ul>	Mastery)	Class-performance evaluations		Blackboard Labor code 2019 available on Blackboard
15	<b>Revision/ Tutoring classes</b>		Quizzes Projects		

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
In class evaluation (20%)	70% pass	80% pass	100% pass	100% pass	100% pass
Midterm examination (30%)	70% pass	80% pass	100% pass	100% pass	100% pass
Final examination (50%)	70% pass	80% pass	100% pass	100% pass	100% pass

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

## 5. Rubrics

No.	CLOs	Criteria	COMPLETELY FAIL Below 30%	INADEQUATE 30% – 49%	ADEQUATE 50% - 69%	ABOVE AVERAGE 70% - 89%	EXEMPLARY ≥ 90%
1	CLO 1	<b>Organisation and clarification</b>	No evidence of organization and coherence	Does not organise ideas logically and with clarification  Limited evidence of coherence  Ideas lack consistence	Generally organised logically, with evidence of progression  Occasionally, there may be a lack of focus or ideas may be tangential	Clear organization and progression.  Responds appropriately and relevantly, although some ideas are underdeveloped	Response is focused, detailed and non-tangential.  Shows a high degree of attention to logic and reasoning of points.  Clearly leads the reader to the conclusion and stirs thought regarding the topic
2		<b>Originality and usefulness of the analysis</b>	Shows no ability to identify legal issues or a clear inability to gather the facts	Demonstrates an incomplete grasp of the task.  There is no overall sense of creative coherence.  Arguments are addressed incompletely.	Shows ability to identify legal issues, gather the facts and develop claims.  Argument are addressed well but no links with evidence	Shows strong ability to identify legal issues, gather the fact and develop claims as well as link claims with evidence.  Overall, an acceptable solution is offered and explained	Shows strong ability to identify legal issues, gather the facts and develop claims as well as link claims with evidence.  Satisfactory solutions are offered and supported
3		<b>Use of data/information</b>	Shows no effort to incorporate information from primary and secondary sources	Shows little information from sources. Poor handling of sources	Shows moderate amount of source information incorporated.  Some key points supported by sources.  Quotations may be poorly integrated into paragraphs.  Some possible problems with source citations	Draws upon sources to support most points.  Some evidence may not support arguments or may appear where inappropriate.  Quotations integrated well into paragraphs.  Sources cited correctly	Draws upon primary and secondary source information in useful and illuminating ways to support key points.  Excellent integration of quoted material into paragraphs. Source cited correctly
4	CLO2	<b>Use of frameworks</b>	Shows no effort to structure	Shows limited ability to structure	Shows effort to link problems with the theoretical	Shows ability to structure problems in	Shows ability to structure problems in correspondence to

			problems in correspondence to theoretical frameworks	problems in correspondence to theoretical frameworks	frameworks. There are still some mistakes	correspondence to theoretical frameworks correctly. Minor mistakes in resolving problems	theoretical frameworks correctly. The problems are well resolved
5		<b>Quality of arguments</b>	Shows no effort to construct logical arguments. Fails to support analysis	Shows little attempt to offer support for key claims or to relate evidence to analysis. Reasons offered are irrelevant.	Shows argument of poor quality. Weak, undeveloped reasons are offered to support key claims	Shows clear, relevant and logical arguments.	Shows identifiable, reasonable and sound arguments. Clear reasons are offered to support key claims.

*Ho Chi Minh City, May 2023*  
*Head of Office of Academic Affairs*



*Huỳnh Khả Tú*



**COURSE SYLLABUS****Course Name: ENGINEERING PROBABILITY &  
STATISTICS**Course Code: **IS004IU****1. General information**

Course designation	
Semester(s) in which the course is taught	2
Person responsible for the course	<i>Dr. Phan Nguyen Ky Phuc</i>
Language	English
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture, lesson, project</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours<sup>1</sup>:</i>
Credit points	4
Required and recommended prerequisites for joining the course	

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	On completion of this course, the student will be able to develop probability problems in engineering, conditional probability, discrete and continuous distributions, sampling distribution, interval estimates, hypothesis testing, analysis of variance, regression models and non-parametric testing.																																	
Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td> <p><b>CLO1. Students are able to master the basic knowledge of calculating histogram, percentile and basic statistics index</b></p> <p><b>CLO2. Students are able to master the basic knowledge of formulating the conditional probability, discrete, continuous random variable problem</b></p> <p><b>CLO3. Students are able to use different methods to solve engineering tasks such as setup the proper hypothesis testing, ANOVA, linear regression</b></p> </td> </tr> <tr> <td>Skill</td> <td> <p><b>CLO4. Students are able to apply their knowledge and develop practical skills for solving problems, conducting experiments and developing equipment and processes of engineering by using EXCEL software</b></p> </td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	<p><b>CLO1. Students are able to master the basic knowledge of calculating histogram, percentile and basic statistics index</b></p> <p><b>CLO2. Students are able to master the basic knowledge of formulating the conditional probability, discrete, continuous random variable problem</b></p> <p><b>CLO3. Students are able to use different methods to solve engineering tasks such as setup the proper hypothesis testing, ANOVA, linear regression</b></p>	Skill	<p><b>CLO4. Students are able to apply their knowledge and develop practical skills for solving problems, conducting experiments and developing equipment and processes of engineering by using EXCEL software</b></p>																											
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (4 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Introduction to Probability and Statistics</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Random variables &amp; Condition Probability</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Discrete Random Variables</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Continuous Random Variables</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Sampling and Central Limit Theorems</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>One Population Hypothesis Testing</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Two Population Hypothesis Testing</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>ANOVA</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Linear Regression</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Excel Tool</td> <td>1</td> <td>U</td> </tr> </tbody> </table>	Topic	Weight	Level	Introduction to Probability and Statistics	1	I, T	Random variables & Condition Probability	2	I, T	Discrete Random Variables	2	I, T	Continuous Random Variables	2	I, T	Sampling and Central Limit Theorems	1	I, T	One Population Hypothesis Testing	2	I, T	Two Population Hypothesis Testing	2	I, T	ANOVA	1	I, T	Linear Regression	1	I, T	Excel Tool	1	U
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Examination forms	Written Exam																																	

Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	<b>Textbooks:</b> [1] Introduction to Probability and Statistics for Engineers and Scientists 4 <sup>th</sup> ed. Sheldon M. Ross, Academic Press  <b>References:</b> 1. A first course of Probability, 4 <sup>th</sup> ed, Sheldon M. Ross, Prentice Hall

## 2. Learning Outcomes Matrix (optional)


The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	X						
2	X						
3						X	
4						X	

### Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*

7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessments	Learning activities	Resources
1	Introduction to Probability and Statistics	1		Lecture	
2 & 3	Random variables & Condition Probability	1	HW1	Lecture Think pair-share HW	
4&5	Discrete Random Variables	2	Quiz1	Lecture Quiz	
6&7	Continuous Random Variables	2	HW2	Lecture HW	
8	Sampling and Central Limit Theorems	2	HW3	Lecture HW	
9	<b>Midterm</b>				
10	One Population Hypothesis Testing	3		Lab	
11 & 12	Two Population Hypothesis Testing	3	Quiz2	Lecture Quiz	
13 & 14	ANOVA	3		Lecture HW	
15	Linear Regression	3	HW4	Lecture HW Group Project	
16	Excel Tool	4	Quiz3	- Lecture Quiz	
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes (10%)	Qz1 60% Passes		Qz3 60% Passes	... ...%Pass
Howework exercises (20%)	HW1 50% Passes	HW2 50% Passes	HW3 50% Passes	HW4 50% Passes
Midterm (30%)		60% Passes		
Final (40%)			60% Passes	

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Part 1.... (...%)</b>			
<b>Criterion 1:</b>			
<b>Criterion 2:</b>			
<b>Criterion 3:</b>			
<b>Criterion ...:</b>			
<b>Part 2.... (...%)</b>			
<b>Criterion 1 ...:</b>			
<b>Criterion ...:</b>			
<b>Part 3.... (...%)</b>			
<b>Criterion 1...:</b>			
<b>Criterion ...:</b>			
<b>Part .... (...%)</b>			
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
<b>5</b>	Demonstrates complete understanding of the problem. All requirements of task are included in response
<b>4</b>	Demonstrates considerable understanding of the problem. All requirements of task are included.
<b>3</b>	Demonstrates partial understanding of the problem. Most requirements of task are included.
<b>2</b>	Demonstrates little understanding of the problem. Many requirements of task are missing.
<b>1</b>	Demonstrates no understanding of the problem.
<b>0</b>	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*  
*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*



**COURSE SYLLABUS****Course Name: ENGINEERING ECONOMY**Course Code: **IS020IU****1. General information**

<b>Course designation</b>	<i>This subject will provide the student with a comprehensive view of economic decisions involving engineering alternatives; annual cost, present &amp; future worth, rate of return, and benefit-to-cost; before and after-tax replacement economy; organizational financing; break-even charts; unit and minimum-cost public sector studies.</i>
<b>Semester(s) in which the course is taught</b>	4
<b>Person responsible for the course</b>	MSc. Nguyen Hoang Huy
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, homework.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Students will be provided with skills of using data from a variety of sources, be introduced to basic principles of economic analysis for decision making among alternative courses of action in engineering; understand knowledge of probabilistic risks, depreciation, tax and benefit-cost ratios in analyzing engineering applications. Besides that, students can apply cash flow diagrams into economy analysis and alternative analysis techniques for engineering applications; apply techniques and methods of sensitivity analysis for engineering problems to compare and make decisions between alternatives.																													
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:																													
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																												
	<b>Knowledge</b>	<b>CLO1. Understand major principles of economic analysis for decision making among alternative courses of action in engineering as breakeven, costs, cash flow.</b>  <b>CLO2. Understand knowledge of probabilistic risks, depreciation, tax and benefit-cost ratios in analyzing engineering applications.</b>																												
	<b>Skill</b>	<b>CLO3. Apply cash flow diagram into economy analysis and sensitivity analysis for engineering problems to compare and make decisions among alternatives.</b>																												
<b>Attitude</b>	<b>CLO4. Reasons around ethical and privacy issues in this course conduct and apply ethical practices.</b>																													
<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Lecture 1: Introduction to EE</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Lecture 2: Cost concepts and Design Economics</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Lecture 3: The time value of money</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Lecture 4: Evaluating a single project.</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Lecture 5: Comparison and Selection among alternatives</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Lecture 6: Depreciation and Income taxes</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Lecture 7: Evaluating projects with the benefit-cost ratio method</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Lecture 8: Replacement analysis</td> <td>1</td> <td>I, T</td> </tr> </tbody> </table>			Topic	Weight	Level	Lecture 1: Introduction to EE	1	I, T	Lecture 2: Cost concepts and Design Economics	1	I, T	Lecture 3: The time value of money	2	I, T	Lecture 4: Evaluating a single project.	2	I, T	Lecture 5: Comparison and Selection among alternatives	2	I, T	Lecture 6: Depreciation and Income taxes	2	I, T	Lecture 7: Evaluating projects with the benefit-cost ratio method	1	I, T	Lecture 8: Replacement analysis	1	I, T
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<b>Examination forms</b>	Short-answer questions, exercises																													

<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.  Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	[1] W.G. Sullivan, E.M. Wicks, C.P. Koelling (2012), Engineering Economy, 15th edition, Prentice Hall. [2] Blank, L., & Tarquin, A. (2012). Engineering Economy 7th edition. [3] Eschenbach, T. G. (2003). Engineering economy. New York: Oxford University Press.

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1		x					
2		x					
3						x	
4				x			

*Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
- an ability to communicate effectively with a range of audiences*
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2b	1.3c	2.1a,			2.4a	2.5a	

				2.1b					
2		1.2b	1.3c	2.1a, 2.1b			2.4a	2.5a	
3	1.2a		1.3d		2.2b		2.4b	2.5a	
4	1.1b		1.3c					2.5b	2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to EE	1		Lecture, Group work	[1]. 1
2	Lecture 2: Cost concepts and Design Economics	1		Lecture, Group work	[1].2
3 & 4	Lecture 3: The time value of money	1,3,4	HW 1	Lecture, Group work	[1].4
5	Lecture 4: The time value of money (con't)	1,3,4	HW 2	Lecture, Group work	[1]. 4
6 & 7	Lecture 5: Evaluating a single project.	3	HW 3	Lecture, Group work	[1]. 5
8	Review for Midterm				
	Midterm				
9 & 10	Lecture 6: Comparison and Selection among alternatives	2, 3, 4	HW 4	Lecture, Group work	[1]. 6
11&12	Lecture 7: Depreciation and Income taxes	2, 3, 4	HW 5	Lecture, Group work	[1]. 7
13	Lecture 8: Evaluating projects with the benefit-cost ratio method	2, 3, 4	HW 6	Lecture, Group work	[1]. 10
14	Lecture 9: Replacement analysis	2, 3, 4	HW 6	Lecture, Group work	[1]. 9
15	Review for Final Exam				
	Final exam				

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercises (30%)	HW1-2 50% Passes	HW4, HW5, HW6	HW1-6 50%Pass	HW1-6 50%Pass

		50% Pass		
Midterm exam (30%)	Q1 50% Pass	Q2 50% Pass	Q3, Q4 50% Pass	
Final exam (40%)	Q1 50% Pass	Q2 50% Pass	Q3, Q4 50% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>			
<b>TOTAL SCORE</b>			
	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response

4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

**6. Date revised: March 23, 2022**

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and  
Management**  
*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: PRODUCTION MANAGEMENT**Course Code: **IS019IU****1. General information**

<b>Course designation</b>	Introduction to production systems. Production planning and control in decision making. Forecasting. Aggregate production planning. Capacity planning. Materials requirement planning. Advanced techniques and approaches in modern production planning and control for designing production systems.
<b>Semester(s) in which the course is taught</b>	4
<b>Person responsible for the course</b>	Tran Van Ly
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, homework.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.



<b>Required and recommended prerequisites for joining the course</b>	None	
<b>Course objectives</b>	Students will be provided with knowledge and skills of forecasting, inventory, aggregate planning, MPS/MRP, facility layout and location, and production scheduling & sequencing.	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<p><b>CLO1. Able to align the project to the organization's strategic plans and business justification throughout its lifecycle; to identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders.</b></p> <p><b>CLO2. Able to manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders</b></p> <p><b>Able to implement general business concepts, practices, and tools to facilitate project success.</b></p>
	<b>Skill</b>	<b>CLO3. Work effectively in group project in a specific context; combining the techniques to conduct practical cases. Respond to the needs of community and industrial sectors</b>
<b>Attitude</b>	<p><b>CLO4. Able to apply appropriate legal and ethical standards.</b></p> <p><b>Adapt project management practices to meet the needs of stakeholders from multiple sectors of the economy (i.e. consulting, government, arts, media, and charity organizations); Identify and follow strictly ethical disciplines in project management</b></p>	

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	<b>Lecture 1: Introduction to Production Management</b>	<b>1</b>	<b>I, T</b>
	<b>Lecture 2: Forecasting</b>	<b>1</b>	<b>I, T</b>
	<b>Lecture 3: Inventory Management</b>	<b>2</b>	<b>I, T</b>
	<b>Lecture 4: Aggregate Planning</b>	<b>1</b>	<b>I, T</b>
	<b>Lecture 5: Modern Production System</b>	<b>2</b>	<b>I, T</b>
	<b>Lecture 6: Material Requirement Planning (MRP)</b>	<b>2</b>	<b>I, T</b>
	<b>Lecture 7: Facility layout and Location</b>	<b>2</b>	<b>I, T</b>
	<b>Lecture 8: Scheduling &amp; Sequencing</b>	<b>1</b>	<b>I, T</b>
<b>Examination forms</b>	Short-answer questions, exercises		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
<b>Reading list</b>	[1] Russell & Taylor, Operations Management, Along the Supply Chain. 7th ed., John Wiley & Son, Inc. [2] W. J. Hopp and M. L. Spearman (2008), Factory Physics: The Foundations of Manufacturing Management, 3rd ed., Irwin/McGraw-Hill. [3] D. Sipper and R. L. Bulfin, (1997), Production: Planning, Control, and Integration, McGraw Hill. [4] Edward A. Silver, David F. Pyke and Rein Peterson, Inventory Management and Production Planning and Scheduling, 3rd ed., John Wiley & Sons.		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1		x					
2		x					
3						x	
4				x			

*Intended Learning Outcomes*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1b		1.3c					2.5b	2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to Production Management	1		Lecture, Group work	[1]. 1
2	Lecture 2: Forecasting	1	HW 1	Lecture, Group work	[1].12
3 & 4	Lecture 3: Inventory Management	1,3,4	HW 2	Lecture, Group work	[1].13
5&6	Lecture 4: Aggregate Planning	1,3,4	HW 3	Lecture, Group work	[1]. 14
7	Lecture 5: Modern Production System	3		Lecture, Group work	[1]. 16

8	Review for Midterm				
Midterm					
9 & 10	Lecture 6: Material Requirement Planning (MRP)	2, 3, 4	HW 4	Lecture, Group work	[1]. 15
11&12	Lecture 7: Facility layout and Location	2, 3, 4	HW5	Lecture, Group work	[1]. 7
13	Lecture 8: Scheduling & Sequencing	2, 3, 4	HW 6	Lecture, Group work	[1]. 17
14	Project Presentation	2, 3, 4		Problems solving Group work	[1].
15	Review for Final Exam				
Final exam					

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercises (30%)	HW1-2 50%Pass	HW4, HW5, HW6 50%Pass	HW1-6 50%Pass	HW1-6 50%Pass
Midterm exam (30%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	
Final exam (40%)	Q1 50%Pass	Q2 50%Pass	Q3, Q4 50%Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		

<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		
<b>Analysis and discussion demonstrate good subject mastery</b>	<b>30</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		
<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone			Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling,	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting,	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and

	and speaker appears polished and confident.	and speaker appears comfortable.	understandable, and speaker appears tentative.	speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

**6. Date revised: August 23, 2022**

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**  
*(Signature)*

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: INTRODUCTION TO INDUSTRIAL AND  
SYSTEMS ENGINEERING**Course Code: **IS001IU****1. General information**

Course designation	<i>This course will provide the students with an introduction to basic engineering concepts. Opportunities are provided to develop skills in oral and written communication, and department-specific material. Case studies are presented and analyzed. Students will work on interdisciplinary projects which corresponding to the building of physical models in the fields of Production, Transportation, Warehouse, and other industrial engineering related fields</i>
Semester(s) in which the course is taught	2
Person responsible for the course	Dr Ha Thi Xuan Chi
Language	English
Relation to curriculum	Compulsory
Teaching methods	Group project, discussion, laboratory.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 40 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 15 Private study including examination preparation, specified in hours <sup>1</sup> : 25
Credit points	1
Required and recommended prerequisites for joining the course	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.



Course objectives	Introduction to basic engineering concepts. Opportunities are provided to develop skills in oral and written communication, and department-specific material. Case studies are presented and analyzed. Students will work on interdisciplinary projects which corresponding to the building of physical models in the fields of Production, Transportation, Warehouse, and other industrial engineering related fields															
Course learning outcomes	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td> <p><b>CLO1.</b> Students have integrative knowledge of the basis and importance of Industrial Engineering and Management systems</p> <p><b>CLO2.</b> Student have integrative knowledge, techniques and skills which enhance student's life-long learning ability.</p> </td> </tr> <tr> <td><b>Skill</b></td> <td><b>CLO3.</b> Students are able to cooperate with others, organize and implement industry-related projects effectively and get used to leadership.</td> </tr> <tr> <td><b>Attitude</b></td> <td>CLO4. Students develop life-long learning attitude implementing engineering blueprints in cooperation with engineers and non-engineers.</td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	<b>Knowledge</b>	<p><b>CLO1.</b> Students have integrative knowledge of the basis and importance of Industrial Engineering and Management systems</p> <p><b>CLO2.</b> Student have integrative knowledge, techniques and skills which enhance student's life-long learning ability.</p>	<b>Skill</b>	<b>CLO3.</b> Students are able to cooperate with others, organize and implement industry-related projects effectively and get used to leadership.	<b>Attitude</b>	CLO4. Students develop life-long learning attitude implementing engineering blueprints in cooperation with engineers and non-engineers.							
Competency level	Course learning outcome (CLO)															
<b>Knowledge</b>	<p><b>CLO1.</b> Students have integrative knowledge of the basis and importance of Industrial Engineering and Management systems</p> <p><b>CLO2.</b> Student have integrative knowledge, techniques and skills which enhance student's life-long learning ability.</p>															
<b>Skill</b>	<b>CLO3.</b> Students are able to cooperate with others, organize and implement industry-related projects effectively and get used to leadership.															
<b>Attitude</b>	CLO4. Students develop life-long learning attitude implementing engineering blueprints in cooperation with engineers and non-engineers.															
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture and practice session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight (hour)</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Introduction to Industrial and Systems Engineering</td> <td>1</td> <td>I</td> </tr> <tr> <td>Introduction to Electrical and Automation Engineering</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Students do the project at Laboratory</td> <td>12</td> <td>U</td> </tr> <tr> <td>Group project presentation and demonstration</td> <td>1</td> <td>U</td> </tr> </tbody> </table>	Topic	Weight (hour)	Level	Introduction to Industrial and Systems Engineering	1	I	Introduction to Electrical and Automation Engineering	1	I, T	Students do the project at Laboratory	12	U	Group project presentation and demonstration	1	U
Topic	Weight (hour)	Level														
Introduction to Industrial and Systems Engineering	1	I														
Introduction to Electrical and Automation Engineering	1	I, T														
Students do the project at Laboratory	12	U														
Group project presentation and demonstration	1	U														
Examination forms	Project- based group presentation															
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>															

<b>Reading list</b>	
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1					x		
2			x				
3					x		
4							x

### *Intended Learning Outcomes*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	<b>1.1c</b>		<b>1.3b</b>						<b>2.6a</b>
2	<b>1.1c</b>		<b>1.3a</b>						<b>2.6a</b>
3	<b>1.1c</b>		<b>1.3b</b>						<b>2.6a</b>
4	<b>1.1a</b> <b>1.1b</b> <b>1.1c</b>		<b>1.3c</b>			<b>2.3a</b>	<b>2.4c</b>		

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Industrial and Systems Engineering	1, 2	Project	Lecture-advice, lab, team work, Q&A	
2	Introduction to Electrical and Automation Engineering	1, 2	Project	Lecture-advice, lab, team work, Q&A	
3-14	Students do the project at Laboratory	1,2,3, 4	Project	Lecture-advice, lab, team work, Q&A	
15	Group project presentation and demonstration	4	Project	Group presentation, Q&A	

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Group projects (100%)	Group project 80% Pass	Group project 80% Pass	Group project 80% Pass	Group project 80% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

### 5. Rubrics (optional)

#### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		

<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence Selecting and using information to investigate a point of view or conclusion</b>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

**6. Date revised: April 15th, 2022**

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, appearing to be 'NVH', written over a faint, illegible stamp.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: CAD/CAM/CNC**Course Code: **IS085IU****1. General information**

<b>Course designation</b>	<i>This subject will provide design parts or mechanical products by CAD/CAM software. The students are studied geometric transformations, geometric modeling, mathematical representations of curves, Wire frame modeling, surface and solid modeling. Numerical control systems and machine tools. Manual part programming, computerized part programming, CAD/CAM/CNC systems integration.</i>
<b>Semester(s) in which the course is taught</b>	5
<b>Person responsible for the course</b>	Nguyen Van Chung
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, Exercises, Assignment, Lab.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 80 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 50 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3 (2 lecture + 1 Laboratory)
<b>Required and recommended prerequisites for joining the course</b>	Engineering Drawing

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Understand the fundamental and advanced concepts in computer graphics and computer-aided-design. Know the functions of a geometric solid modeler and modeling an object. Use commercial CAD/CAM software for engineering design. Understand CAD/CAM/CNC can be used in the different stages of design and manufacture of a product								
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td><b>CLO1. Students will be able to understand the fundamental and advanced concepts in computer graphics, computer-aided-design and computer – aided Manufacturing.</b></td> </tr> <tr> <td><b>Skill</b></td> <td><b>CLO2. Use commercial CAD/CAM software for engineering design and manufacturing.</b></td> </tr> <tr> <td><b>Attitude</b></td> <td><b>CLO3. Understand CAD/CAM/CNC can be used in the different stages of design and manufacture of a product on CNC machines.</b></td> </tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<b>CLO1. Students will be able to understand the fundamental and advanced concepts in computer graphics, computer-aided-design and computer – aided Manufacturing.</b>	<b>Skill</b>	<b>CLO2. Use commercial CAD/CAM software for engineering design and manufacturing.</b>	<b>Attitude</b>	<b>CLO3. Understand CAD/CAM/CNC can be used in the different stages of design and manufacture of a product on CNC machines.</b>
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>								
<b>Knowledge</b>	<b>CLO1. Students will be able to understand the fundamental and advanced concepts in computer graphics, computer-aided-design and computer – aided Manufacturing.</b>								
<b>Skill</b>	<b>CLO2. Use commercial CAD/CAM software for engineering design and manufacturing.</b>								
<b>Attitude</b>	<b>CLO3. Understand CAD/CAM/CNC can be used in the different stages of design and manufacture of a product on CNC machines.</b>								



<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	<b>Weight: lecture and practice session</b>		
	<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>		
	<b>Topic</b>	<b>Content</b>	<b>Weight (hour)</b>
	Introduction to CAD/CAM/CNC	Introduction to CAD/CAM, CNC. Need for CAD/CAM. Hardware, software. Application. Chapter 1 (Ibrahim Zeid)	1
	Geometric Transformations and Modeling	Types of geometric models. Coordinate systems. Chapter 2 (Ibrahim Zeid) Chapter 6 (P.Radhakrishman, et al)	2
	Mathematical representations of Curves, surfaces, Solids	Curves, surfaces, solids Representation. Bezier, B-Spline curves and solids. Chapter 6, 7, 9 (Ibrahim Zeid)	3
	CAD/CAM Data Exchange	Types of Interfaces, Various standard interfaces, IGES (Initial Graphics Exchange Specification)	1
	<b>Midterm Exam</b>		
	Numerical Control Systems	Fundamentals of NC Technology. CNC, the components of CNC. Application Chapter 7, 23 (Mikell P. Groover)	2
	CNC Machines	Types of CNC machines. Application of CNC machines. Chapter 12 (P.Radhakrishman, et al)	2
	NC programming	Types of part programming. Fundamental elements for developing manual part programming. Programming for milling and turning. Chapter 23 (Mikell P. Groover)	3
	Computer-Aided Process Planning	Introduction and activities of CAPP. CAPP approaches and systems. Information required for CAPP Chapter 9 (P.Radhakrishman, et al) Chapter 24 (Mikell P. Groover)	1
	CAD/CAM/CNC Lab	Lab 1. Initiating the Graphics Package.	3

	Lab 2. Drawing of Primitives. Lab 3. Modifying Geometry. Lab 4. Toolpath Creation Lab 5. Generation of NC program Lab 6. Link and run-on CNC machine <b>Final Exam</b>		
<b>Examination forms</b>	Practice, Writing questions		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
<b>Reading list</b>	[1] Ibrahim Zeid, "CAD/CAM Theory and Practice", 2nd ed., Mc Graw Hill, 2009. [2] P.Radhakrishnan, S. Subramanyan, V. Raju, <i>CAD/CAM/CIM</i> , New Age International Limited, Publishers, 2008. [3] Mikell P. Groover, <i>Automation, Production Systems, and Computer-Integrated Manufacturing</i> , 3rd edition, Prentice Hall, 2007. [4] SOFTWARE: Mastercam/Solid work/Pro-E		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2				x			
3						x	

### *Intended Learning Outcomes (ILO)*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and*

*societal contexts*

5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,1.2b	1.3d	2.1a,2.1b	2.2a				
2	1.1b		1.3c					2.5b	2.6b
3		1.2a	1.3d		2.2b		2.4b	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to CAD/CAM/CNC	CLO 1		Lecture presentation, in-class discussion	Reading [1]
2, 3	Geometric Transformations and Modeling	CLO 1, 2	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1], [2]
4, 5, 6	Mathematical representations of Curves, surfaces, Solids	CLO 1, 2	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1], [2]
7	CAD/CAM Data Exchange	CLO 1		Lecture presentation, in-class discussion	Reading [1], [2]
8-9	<b>Midterm</b>				
10-11	Numerical Control Systems	CLO 2, 3	Quiz, exercises	Lecture presentation, in-class discussion	Reading [1]
12-13	CNC Machines	CLO 2, 3	Quiz, exercises	Lecture presentation, in-class discussion	Reading [2]
14-15-16	NC programming	CLO 2, 3	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [3]
17	Computer-Aided Process Planning	CLO 2	Exercises	Lecture presentation, in-class discussion	Reading [3]
8 weeks	CAD/CAM/CNC Lab	CLO 3	Assignments	Practice	Reading [4]
18	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Exercises, Quizzes, Home works (10%)	Quiz, exercises 60% Pass	Quiz, exercises, HW 60% Pass	
Lab (20%)			Practice 60% Pass
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	<b>10</b>		
Introduction demonstrates thorough knowledge of relevant background and prior work	<b>10</b>		
Analysis and discussion demonstrate good subject mastery	<b>35</b>		
Summary and conclusions appropriate and complete	<b>5</b>		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	<b>5</b>		
Content clearly and logically organized, good transitions	<b>5</b>		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	<b>10</b>		
Clear and easy to read	<b>10</b>		
Quality of Layout and Graphics (10%)	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence Selecting and using information to investigate a point of view or conclusion</b>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

<p><b>Conclusions and related outcomes (implications and consequences)</b></p>	<p>Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.</p>	<p>Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.</p>	<p>Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.</p>	<p>Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.</p>
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<p><b>Capstone</b></p> <p><b>4</b></p>	<p><b>Milestone</b></p>		<p><b>Benchmark</b></p> <p><b>1</b></p>
		<p><b>3</b></p>	<p><b>2</b></p>	
<p><b>Organization</b></p>	<p>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.</p>	<p>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.</p>	<p>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.</p>	<p>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.</p>
<p><b>Language</b></p>	<p>Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.</p>	<p>Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.</p>	<p>Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.</p>	<p>Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.</p>
<p><b>Delivery</b></p>	<p>Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.</p>	<p>Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.</p>	<p>Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.</p>	<p>Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.</p>
<p><b>Supporting Material</b></p>	<p>A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.</p>	<p>Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.</p>	<p>Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.</p>	<p>Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.</p>
<p><b>Central Message</b></p>	<p>Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)</p>	<p>Central message is clear and consistent with the supporting material.</p>	<p>Central message is basically understandable but is not often repeated and is not memorable.</p>	<p>Central message can be deduced but is not explicitly stated in the presentation.</p>

Source: Association of American Colleges and Universities

**6. Date revised: April 13th, 2022**

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: ENGINEERING DRAWING**Course Code: **IS054IU****1. General information**

<b>Course designation</b>	<i>This subject will provide students skills to present and interpret spatial models on planar models, present engineering drawings according to international standards (ISO). Methods of presenting models: orthogonal projection, isometric projection, ... Apply the projections to present objects in the drawings.</i>
<b>Semester(s) in which the course is taught</b>	2
<b>Person responsible for the course</b>	Nguyen Van Chung
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, Exercises, Assignment.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.



<b>Course objectives</b>	Students will be provided with knowledge and skills of Analyzing, interpreting, and presenting engineering drawings. Applying appropriate drawing techniques for a practical application. Problem resolution on drawings. Systematically analyze the problem and apply the appropriate technique to solve the problem									
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td><b>CLO1. Students will be able to Analyze, interpreting, and presenting engineering drawings.</b></td> </tr> <tr> <td><b>Skill</b></td> <td><b>CLO2. Students will be able to Apply appropriate drawing techniques for a practical application. Problem resolution on drawings</b></td> </tr> <tr> <td><b>Attitude</b></td> <td><b>CLO3. Students will have integrative knowledge for Systematically analyze the problem and apply the appropriate technique to solve the problem.</b></td> </tr> </tbody> </table>		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<b>CLO1. Students will be able to Analyze, interpreting, and presenting engineering drawings.</b>	<b>Skill</b>	<b>CLO2. Students will be able to Apply appropriate drawing techniques for a practical application. Problem resolution on drawings</b>	<b>Attitude</b>	<b>CLO3. Students will have integrative knowledge for Systematically analyze the problem and apply the appropriate technique to solve the problem.</b>
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>									
<b>Knowledge</b>	<b>CLO1. Students will be able to Analyze, interpreting, and presenting engineering drawings.</b>									
<b>Skill</b>	<b>CLO2. Students will be able to Apply appropriate drawing techniques for a practical application. Problem resolution on drawings</b>									
<b>Attitude</b>	<b>CLO3. Students will have integrative knowledge for Systematically analyze the problem and apply the appropriate technique to solve the problem.</b>									

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	<b>Weight: lecture and practice session</b>		
	<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>		
	<b>Topic</b>	<b>Content</b>	<b>Weight (hour)</b>
	Introduction to Engineering drawing (ED)	Introduction to ED, Standardization Chapter 1 (K Venkata Reddy) Chapter 1 (M.B. Shah,B.C. Rana)	1
	Drawing Instruments	Drawing Instrument, Drawing standards. Chapter 1 (K Venkata Reddy) Chapter 1 (M.B. Shah,B.C. Rana)	1
	Lettering and Dimensioning	Drawing sheet layout, Lines, Lettering, Dimensioning Chapter 2 (K Venkata Reddy) Chapter 1 (M.B. Shah,B.C. Rana)	3
	Geometrical Constructions	Geometrical constructions Chapter 4 (K Venkata Reddy) Chapter2 (K. Morling) Chapter 2 (M.B. Shah,B.C. Rana)	2
	Orthographic Projection	Types of Projections, Projection of an Object, first/third angle Projection. Views of Surfaces Chapter 5, 9 (K Venkata Reddy) Chapter 3, 6, 10 (K. Morling) Chapter 3, 4, 5, 10 (M.B. Shah,B.C. Rana)	5
	<b>Midterm Exam</b>		
	Sections and Sectional Views	Types of sections, Sectional orthographic projections, Sectioning rule for machine elements Chapter 11, 12 (K Venkata Reddy) Chapter 7, 11 (M.B. Shah,B.C. Rana)	7
	Part section	Representation of part section Chapter 18 (K. Morling)	1
Assembly drawing	Views used in Assembly drawings, section lines in Assemblies	2	
<b>Final Exam</b>			

<b>Examination forms</b>	Presenting engineering drawings
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	[1] K Venkata Reddy, <i>Textbook of Engineering Drawing</i> , BSP, 2008. [2] K. Morling, <i>Geometric and Engineering Drawing</i> , British Library, 2003. [3] M.B. Shah, B.C. Rana, <i>Engineering drawing</i> , Dorling Kindersley, 2007. [4] Basant Agrawal, Tata, <i>Engineering Drawing</i> , McGraw-Hill Education, 2008.

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2		x					
3				x		x	

### *Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	ASIIN learning outcomes								
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,1 .2b	1.3d	2.1a,2 .1b	2.2a				
2		1.2b	1.3c	2.1a,2 .1b			2.4a	2.5a	
3	1.1b	1.2a	1.3c,1 .3d		2.2b		2.4b	2.5a,2 .5b	2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Engineering drawing	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [3]
2	Drawing Instruments	CLO 1	Exercises	Lecture presentation, in-class discussion	Reading [1] , [3]
3	Lettering and Dimensioning	CLO 1,2	Exercises	Lecture presentation, in-class discussion	Reading [1] , [3]
4	Geometrical Constructions	CLO 2, 3	Exercises	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
5-6-7	Orthographic Projection	CLO 2, 3	Exercises, HW	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
8-9	<b>Midterm</b>				
10-11-12-13	Sections and Sectional Views	CLO 3	Exercises, HW	Lecture presentation, in-class discussion	Reading [1] , [3]
14-15	Part section	CLO 3	Quiz	Lecture presentation, in-class discussion	Reading [2]
16	Assembly drawing	CLO 3	Quiz	Lecture presentation, in-class discussion	
17	Revision			in-class discussion	
18	<b>Final exam</b>				

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class Exercises (10%)	Exercises 60% Pass	Exercises 60% Pass	
Homework, Exercises (20%)	Homework, Exercises 60% Pass	Homework, Exercises 60% Pass	Homework, Exercises 60% Pass
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (70%)</b>			
Show the correct dimensions and letters	15		
Correctly represent the lines of Engineering drawings	20		
Correctly and fully present the requirements of the views on drawings	35		
<b>Organization (10%)</b>			
Content clearly and logically organized	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (15%)</b>			
Layout of the views on drawings	15		
Clear and easy to read	5		
<b>Quality of Layout and Graphics (5%)</b>			
<b>TOTAL SCORE</b>			
	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.

1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence Selecting and using information to investigate a point of view or conclusion</b>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone	Benchmark
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	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: April 13th, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and Management*

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*



**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
**School of Industrial Engineering and Management**

**COURSE SYLLABUS**

**Course Name: INTRODUCTION TO COMPUTING –  
MATLAB APPLICATION**

Course Code: IS086IU

**1. General information**

<b>Course designation</b>	<i>This course teaches computer programming using a programming system and language called MATLAB. It is an introductory programming course that uses MATLAB to illustrate general concepts in computer science and programming. Students who successfully complete this course will become familiar with general concepts in computer science, gain an understanding of the general concepts of programming, and obtain a solid foundation in the use of MATLAB.</i>
<b>Semester(s) in which the course is taught</b>	1
<b>Person responsible for the course</b>	<i>Dr. Dao Vu Truong Son</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	<i>Compulsory</i>
<b>Teaching methods</b>	Lecture, lesson, project, seminar.
<b>Workload (incl. contact hours, self-study hours)</b>	<i>(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours<sup>1</sup>: 25</i>
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.



<b>Course objectives</b>	The objective of this course is to introduce students to the basics of Matlab programming as a tool for solving industrial engineering problems. The second part of the course concentrates on Matlab for writing programs with applications from industrial engineering																																													
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO 1. An ability to apply knowledge of mathematics, science and engineering</td> </tr> <tr> <td>Skill</td> <td>CLO 2. An ability to design and conduct experiments, as well as to analyze and interpret data CLO 3. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice</td> </tr> <tr> <td>Attitude</td> <td></td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO 1. An ability to apply knowledge of mathematics, science and engineering	Skill	CLO 2. An ability to design and conduct experiments, as well as to analyze and interpret data CLO 3. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	Attitude																																						
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<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <table border="1"> <thead> <tr> <th><b>Topic</b></th> <th>Course Overview,</th> <th>Orientation</th> </tr> </thead> <tbody> <tr> <td>Introduction to Computers and Programming</td> <td></td> <td></td> </tr> <tr> <td>Introduction to Matlab</td> <td></td> <td></td> </tr> <tr> <td>Expressions and Interactivity</td> <td></td> <td></td> </tr> <tr> <td>Making Decisions</td> <td></td> <td></td> </tr> <tr> <td>Looping</td> <td></td> <td></td> </tr> <tr> <td>Review for Midterm</td> <td></td> <td></td> </tr> <tr> <td style="background-color: #92d050;"><b>Midterm</b></td> <td></td> <td></td> </tr> <tr> <td>Introduction to Visual ProgramminG</td> <td></td> <td></td> </tr> <tr> <td>Decision Making</td> <td></td> <td></td> </tr> <tr> <td>Procedure</td> <td></td> <td></td> </tr> <tr> <td>Elementary Data Structures</td> <td></td> <td></td> </tr> <tr> <td>Introduction to Object-Oriented Programming</td> <td></td> <td></td> </tr> <tr> <td>File Processing</td> <td></td> <td></td> </tr> <tr> <td>Review for final</td> <td></td> <td></td> </tr> </tbody> </table>	<b>Topic</b>	Course Overview,	Orientation	Introduction to Computers and Programming			Introduction to Matlab			Expressions and Interactivity			Making Decisions			Looping			Review for Midterm			<b>Midterm</b>			Introduction to Visual ProgramminG			Decision Making			Procedure			Elementary Data Structures			Introduction to Object-Oriented Programming			File Processing			Review for final		
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<b>Examination forms</b>	Multiple-choice questions, short-answer questions																																													
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																													

<b>Reading list</b>	<p>Textbooks: [1] Stormy Attaway, MATLAB: A Practical Introduction to Programming and Problem Solving, 3rd edition, Elsevier, 2013.</p> <p>References: [1] Shawna Lockhart, Eric Tilleson, An Engineer's Introduction to Programming with MATLAB, SDC, 2018</p> <p>Software: Matlab from Mathworks Inc.</p>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2						x	
3		x					

*ABET\_Student Outcomes*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a	1.3d				2.4b	2.5a	
3		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	
				Lecturer	Student
1	Course Overview, Orientation Introduction to Computers and Programming	CLO 1	Quiz	Lecture presentation	- Class discussion - Read book
2	Introduction to Matlab	CLO 1, 2,3	Quiz	Lecture presentation	- Class discussion - Read book
3	Expressions and Interactivity	CLO 1, 2	Quiz/HW	Lecture presentation	- Class discussion - Read book
4	Making Decisions	CLO 1, 2,3	Quiz/HW	Lecture presentation	- Class discussion - Read book
5	Looping	CLO 1, 2,3	Quiz/HW	Lecture presentation	- Class discussion - Read book
6	Review for Midterm	CLO 1, 2,3	Quiz/HW	Lecture presentation	- Class discussion - Read book
	Midterm				
7	Introduction to Visual Programming	CLO 1, 2, 3	Quiz/HW	Lecture presentation	- Class discussion - Read book
8	Decision Making	CLO 1, 2, 3	Quiz/HW	Lecture presentation	- Class discussion - Read book
9	Procedure	CLO 1, 2, 3	Quiz/HW	Lecture presentation	- Class discussion - Read book
10	Elementary Data Structures	CLO 1, 2, 3	Quiz/HW	Lecture presentation	- Class discussion - Read book
11	Introduction to Object- Oriented Programming	CLO 1, 2, 3	Quiz/HW	Lecture presentation	- Class discussion - Read book
12	File Processing Review for final	CLO 1, 2, 3	Quiz/HW	Lecture presentation	- Class discussion - Read book
	Final exam				

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quizzes and homework (15%)	60% Pass	60% Pass	60% Pass

Project (15%)	60% Pass	60% Pass	60% Pass
Midterm Exam (30%)	60% Pass	60% Pass	60% Pass
Final Exam (40%)	60% Pass	60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....	HW/Assignment: .....		
Date: .....	Evaluator: .....		
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

**Critical thinking value rubric for evaluating questions in exams:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and  
Management**  
*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*



## COURSE SYLLABUS

### Course Name: DETERMINISTIC MODELS IN OPERATIONS RESEARCH

Course Code: IS103IU

#### 1. General information

<b>Course designation</b>	This course provides knowledge to develop linear programming and integer programming formulations for engineering and economic systems, determine optimal solutions to a variety of mathematical programming problems, and present managerial recommendations based on optimal solutions and sensitivity analysis.
<b>Semester(s) in which the course is taught</b>	2
<b>Person responsible for the course</b>	<i>Dr. Ha Thi Xuan Chi</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	<i>Compulsory</i>
<b>Teaching methods</b>	<i>Lecture, lesson, project</i>
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (lecture): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	<b>3 credits</b>

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>							
<b>Course objectives</b>	On completion of this course, the student will be able to develop linear programming and integer programming formulations for engineering and economic systems, determine optimal solutions to a variety of mathematical programming problems, and present managerial recommendations based on optimal solutions and sensitivity analysis.						
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td> <p><b>CLO1. Able to define a mathematical model, formulate a mathematical model with 2 variables, Able to solve a mathematical model with 2 variables by graphical method</b></p> <p><b>CLO2. Able to formulate a mathematical model with more than 2 variables, solve a mathematical model with more than 2 variables by simplex method, big M technique, two phase and revised method.</b></p> <p><b>CLO3. Able to formulate Integer programming, Dynamic Programming, transportation, assignment, shortest paths problems, maximum flow, minimize costs models, solve by using techniques: Branch and Bound, Min-Cut Theory, Dijkstra Algorithm</b></p> </td> </tr> <tr> <td><b>Skill</b></td> <td> <p><b>CLO4. Able to use CPLEX/LINGO software to solve complex problems.</b></p> <p><b>CLO5. Able to analyses output from the linear programming model by using sensitivity analysis and using duality theory to interpret economic meaning</b></p> <p><b>CLO6. Solve NLPs with one variable and several variables</b></p> </td> </tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<p><b>CLO1. Able to define a mathematical model, formulate a mathematical model with 2 variables, Able to solve a mathematical model with 2 variables by graphical method</b></p> <p><b>CLO2. Able to formulate a mathematical model with more than 2 variables, solve a mathematical model with more than 2 variables by simplex method, big M technique, two phase and revised method.</b></p> <p><b>CLO3. Able to formulate Integer programming, Dynamic Programming, transportation, assignment, shortest paths problems, maximum flow, minimize costs models, solve by using techniques: Branch and Bound, Min-Cut Theory, Dijkstra Algorithm</b></p>	<b>Skill</b>	<p><b>CLO4. Able to use CPLEX/LINGO software to solve complex problems.</b></p> <p><b>CLO5. Able to analyses output from the linear programming model by using sensitivity analysis and using duality theory to interpret economic meaning</b></p> <p><b>CLO6. Solve NLPs with one variable and several variables</b></p>
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>						
<b>Knowledge</b>	<p><b>CLO1. Able to define a mathematical model, formulate a mathematical model with 2 variables, Able to solve a mathematical model with 2 variables by graphical method</b></p> <p><b>CLO2. Able to formulate a mathematical model with more than 2 variables, solve a mathematical model with more than 2 variables by simplex method, big M technique, two phase and revised method.</b></p> <p><b>CLO3. Able to formulate Integer programming, Dynamic Programming, transportation, assignment, shortest paths problems, maximum flow, minimize costs models, solve by using techniques: Branch and Bound, Min-Cut Theory, Dijkstra Algorithm</b></p>						
<b>Skill</b>	<p><b>CLO4. Able to use CPLEX/LINGO software to solve complex problems.</b></p> <p><b>CLO5. Able to analyses output from the linear programming model by using sensitivity analysis and using duality theory to interpret economic meaning</b></p> <p><b>CLO6. Solve NLPs with one variable and several variables</b></p>						



<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	<b>Introduction to Operations Research</b>	<b>1</b>	<b>I, T</b>
	<b>Formulating linear programming problems.</b>	<b>2</b>	<b>I, T</b>
	<b>Solution of an LP: Graphical Solution.</b>	<b>1</b>	<b>I, T</b>
	<b>Solution of an LP: Simplex Method, Standard Form, Degeneracy, Alternate Solutions, Unbounded LP, Infeasible LP.</b>	<b>2</b>	<b>I, T</b>
	<b>Solution of an LP: Finding an initial feasible solution, Big-M Method, Two-Phase Method, Solution of an LP using a software package - LINDO.</b>	<b>2</b>	<b>I, T</b>
	<b>Revised Simplex Method, Simplex Formulas, Shadow Price, Reduce Cost.</b>	<b>2</b>	<b>I, T</b>
	<b>Sensitivity Analysis: Changing the objective function coefficient of a basic variable, changing the objective function coefficient of a nonbasic variable, changing the constraint coefficient of a nonbasic variable, changing the RHS values of constraints, adding a new variable.</b>	<b>1</b>	<b>T, U</b>
	<b>LINGO/CPLEX: Introduction Solving Linear Programming Problem</b>	<b>0.5</b>	<b>T, U</b>
	<b>Duality Theorem, Finding the dual of an LP, Economic Interpretation of the Dual Problem and Dual Variables, Dual Simplex Method, How to</b>	<b>0.5</b>	<b>I, T</b>
	<b>Network optimization: Shortest Path Problems: Formulating Equipment replacement problem as Shortest Path Problems, Solving shortest path problems using Dijkstra's Algorithm</b>		<b>T</b>
<b>Integer Programming Problems. Either/or Constraints, If then Constraints, Fixed Charge Problems, Solving Integer Programs using Branch and Bound Method.</b>		<b>T</b>	
<b>Dynamic programming Problems</b>		<b>T</b>	
<b>LINGO/CPLEX Solving Network Optimization, IP problems, DP problems</b>		<b>T</b>	

	<p><b>Nonlinear programming: Solving with one variable and several variables Karush–Kuhn–Tucker</b></p>		T
<b>Examination forms</b>	Written Exam		
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>		
<b>Reading list</b>	<p><b>Textbooks:</b></p> <p>[1] Introduction to Operation Research 9<sup>th</sup> ed. Hillier,Lieberman, McGrawHill</p> <p>[2] Introduction to Mathematical Programming fourth edition, Wayne L. Winston, Munirpallam Venkataramanan.</p> <p><b>References:</b></p> <ol style="list-style-type: none"> <li>1. Bodhibrata Nag, <i>Business Applications of Operations Research</i>, Business Expert Press, 2014. ISBN-13: 978-1-60649-526-1.</li> <li>2. R.K. Ahuja, T.L.,Magnanti, J.B. Orlin, <i>Network Flows: Theory, Algorithms, and Applications</i>, Prentice Hall, 1993. ISBN 0 -13-617549-X.</li> <li>3.. M.S. Bazaraa, H.d. Sherali, C.M. Shetty, <i>Nonlinear Programming: Theory and Algorithms</i>, John Wiley &amp; Sons, 1993, 2nd edition. ISBN 0-471-55793-5.</li> <li>4. G.C. Onwubolu, and B.V.Babu (edited), <i>New Optimization Techniques in Engineering</i> – Nguyen Van Hop, and M.T. Tabucanon, <i>Chapter 14: Improvement of Search Genetic Algorithms: An Application of PCB Assembly Sequencing Problem</i>, Springer-Verlag, Heitzberg, Germany, 2003. ISBN 1434 – 9922.</li> <li>5. Hamdy A. Taha, <i>Operation Research: An Introduction</i>, Prentice Hall, 2017, 10th Edition. ISBN-13: 978-1-292-16554-7</li> </ol>		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	X	X					
2	X	X					
3	X	X					
4						X	
5						X	
6	X	X					

### Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	
2		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	
3		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	
5		<b>1.2a</b>	1.3d		2.2b		2.4b	2.5a	
6		1.2a,b	1.3c,d	2.1a,b	2.2a		2.4a	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Operations Research	1		Lecture	
2	Formulating linear programming problems.	1	HW1	Lecture Think pair-share HW	
3	Solution of an LP: Graphical Solution.	1	Quiz1	Lecture Quiz	
4&5	Solution of an LP: Finding an initial feasible solution, Big-M Method, Two-Phase Method	2	HW2	Lecture HW	
6&7	Sensitivity Analysis: Changing the objective function coefficient of a basic variable, changing the objective function coefficient of a nonbasic variable, changing the constraint coefficient of a nonbasic variable, changing the RHS values of constraints, adding a new variable.	2, 4	HW3	Lecture HW Class discussion	
8	Review	2	HW4	Lecture HW	
<b>Midterm</b>					
9	LINGO/CPLEX: Introduction Solving Linear Programming Problem	4		Lab	
10&11	Network optimization: Shortest Path Problems: Formulating Equipment replacement problem as Shortest Path Problems, Solving shortest path problems using Dijkstra's.	5	HW5	Lecture HW	
12	Integer Programming Problems.	3		Lecture Concept mapping - Think pair-share	
13	Dynamic programming Problems	3	Quiz	Lecture HW Quiz	
14	LINGO/CPLEX Solving Network Optimization, IP problems, DP problems	3		- Lecture	
15	Review	5			
<b>Final exam</b>					

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6
In-class exercises/quizzes (10%)	Qz1 60% Pass		Qz3 60% Pass	... ...% Pass	Qz2 60% Pass	
Howework exercises (20%)	HW1 50% Pass	HW2 50% Pass HW3 50% Pass	HW3 50% Pass HW6 50% Pass	HW3 50% Pass	HW5 50% Pass	
Midterm (30%)		60% Pass			60% Pass	
Final (40%)			60% Pass			60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (80%)</b>			
<b>Problem Identification: Be able to identify different logistics and supply chain problems</b>	<b>20</b>		
<b>Data collection and software usage: Know how to transform the data into the proper form and solve the models using computer-based software such as CPLEX, LINGO, PyCharm, MATLAB, etc.</b>	<b>20</b>		
<b>Methodology: Know how to formulate and solve different logistics and supply chain problems by using the mathematical techniques</b>	<b>20</b>		
<b>Solution and Implementations: Be able to solve practical problems and do the output analysis.</b>	<b>20</b>		
<b>Report writing and Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>TOTAL SCORE</b>		<b>100</b>	

##### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>
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<b>Score</b>	<b>Description</b>
<b>5</b>	<b>Demonstrates complete understanding of the problem. All requirements of task are included in response</b>
<b>4</b>	<b>Demonstrates considerable understanding of the problem. All requirements of task are included.</b>
<b>3</b>	<b>Demonstrates partial understanding of the problem. Most requirements of task are included.</b>
<b>2</b>	<b>Demonstrates little understanding of the problem. Many requirements of task are missing.</b>
<b>1</b>	<b>Demonstrates no understanding of the problem.</b>
<b>0</b>	<b>No response/task not attempted</b>

Note: This rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone		Milestone		Benchmark
	4	3	2	1	
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.	
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.	
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.	
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.	
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.	

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone		Milestone		Benchmark
	4	3	2	1	
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.	

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**  
*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*





## COURSE SYLLABUS

### Course Name: **WORK DESIGN & ERGONOMICS**

Course Code: **IS017IU**

#### 1. General information

<b>Course designation</b>	<i>This subject will provide Problem solving tools (recording and analysis tools, activity charts). Operation analysis, manual work design (principles of motion economy, motion study). Time study (performance rating and allowances), predetermined time systems. Work environment design.</i>
<b>Semester(s) in which the course is taught</b>	4
<b>Person responsible for the course</b>	Nguyen Van Chung
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, lesson, project, Laboratory
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (45 lecture + 15 Lab) Private study including examination preparation, specified in hours <sup>1</sup> : 30
<b>Credit points</b>	4 (3 lecture + 1 laboratory)
<b>Required and recommended prerequisites for joining the course</b>	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Students will be provided the basic concepts of work design and ergonomics. Understand different methods of engineering and operations analysis, motion study, work design. alternative solution methodologies available in time study, ergonomics and human factors. To increase productivity, machine/ equipment utilization, and to reduce human efforts, and to motivate and product employees' health.									
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO1. Students will be able to Recognize and understand basic concepts of work design and ergonomics. and solve complex tasks and problems across several disciplines from global, economic, environmental, and societal aspects.</td> </tr> <tr> <td>Skill</td> <td>CLO2. Students will be able to identify different methods of engineering and operations analysis, and solve the motions, the postures, work design, and time problems by applying principles of basic motion elements and Ergonomics, to evaluate and choose alternative solution methodologies.</td> </tr> <tr> <td>Attitude</td> <td>CLO3. Students will Apply knowledge in work design and ergonomics to increase productivity, machine/ equipment utilization, and to reduce human efforts, and to motivate and product employees' health.</td> </tr> </tbody> </table>		Competency level	Course learning outcome (CLO)	Knowledge	CLO1. Students will be able to Recognize and understand basic concepts of work design and ergonomics. and solve complex tasks and problems across several disciplines from global, economic, environmental, and societal aspects.	Skill	CLO2. Students will be able to identify different methods of engineering and operations analysis, and solve the motions, the postures, work design, and time problems by applying principles of basic motion elements and Ergonomics, to evaluate and choose alternative solution methodologies.	Attitude	CLO3. Students will Apply knowledge in work design and ergonomics to increase productivity, machine/ equipment utilization, and to reduce human efforts, and to motivate and product employees' health.
Competency level	Course learning outcome (CLO)									
Knowledge	CLO1. Students will be able to Recognize and understand basic concepts of work design and ergonomics. and solve complex tasks and problems across several disciplines from global, economic, environmental, and societal aspects.									
Skill	CLO2. Students will be able to identify different methods of engineering and operations analysis, and solve the motions, the postures, work design, and time problems by applying principles of basic motion elements and Ergonomics, to evaluate and choose alternative solution methodologies.									
Attitude	CLO3. Students will Apply knowledge in work design and ergonomics to increase productivity, machine/ equipment utilization, and to reduce human efforts, and to motivate and product employees' health.									

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	<b>Weight: lecture and practice session</b>		
	<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>		
	<b>Topic</b>	<b>Content</b>	<b>Weight (hour)</b>
	Introduction to Work design and Ergonomics	Introduction to the work, work element, basic motion element, Work system. Chapter 1 (Mikell P. Groover)	1 I, T
	Methods Engineering and Graphical tools for Operations Analysis	Introduction to the method engineering, Operation analysis. And analysis tools. Chapter 8 (Mikell P. Groover)	1 I, T
	Motion/Methods Study and Work Design	Basic motion elements and work analysis. Principles of motion economy and work design. Chapter 2, 10 (Mikell P. Groover)	2 T, U
	NIOSH Lifting Equation	NIOSH Lifting equation, Recommended weight limit. T. R. Water, V. P. Anderson, A. Garg	2 T, U
	<b>Midterm Exam</b>		
	Introduction to Time Study	Determine time standard, Allowances. Chapter 12 (Mikell P. Groover)	1 T
	Direct Time Study	Direct time study procedure, Performance rating, time study equipment. Chapter 13 (Mikell P. Groover)	2 T, U
	Predetermined Motion Time Systems	Methods – time measurement. Chapter 14 (Mikell P. Groover)	2 T, U
	Ergonomics and Human Factors	Introduction to ergonomics and human factors, anthropometry, design guidelines for cognitive work. Chapter 22, 23, 24 (Mikell P. Groover)	2 T, U
	Learning Curves	Learning curve theory, determining and application of learning curve. Chapter 19 (Mikell P. Groover)	0.5 I, T
	<i>Laboratory 1</i> Measurement of Grip strength	To measure and compare grip strength of right and left hands. Compare with Grip strength test norms	1 U

	<i>Laboratory 2</i> Measurement of working environment factors	To measure the intensity of illumination, sound level, distance, temperature and practice on measuring instruments	1	U
	<i>Laboratory 3</i> Introducing the Ergonomics software	Introduction to TK Motion Manager Software by NexGen Ergonomics	1	U
	<i>Laboratory 4</i> Work Design	To design the job, analyze the basic motion elements	2	U
	<i>Laboratory 5</i> Motion study and Time study	Design the motions for assembly the product. Improve the motions and posture	2	U
	<i>Laboratory 6</i> Design Layout	Design the room (office) based on ergonomics and condition environment.	1	U
<b>Final Exam</b>				
<b>Examination forms</b>	<b>Writing questions</b>			
<b>Study and examination requirements</b>	<p><b>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</b></p> <p><b>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</b></p>			
<b>Reading list</b>	<p>[1] Mikell P. Groover, <i>Work Systems and the Methods, Measurement, and Management of Work</i>, Prentice-Hall, 2007.</p> <p>[2] A. Freivalds and B. Niebel, <i>Niebel's Methods, Standards, and Work Design</i>, McGraw-Hill, 2009.</p> <p>[3] T. R. Water, V. P. Anderson, A. Garg, <i>Applications Manual for the Revised NIOSH Lifting Equation</i>, Cincinnati, Ohio 45226, 1994.</p>			

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1		x					
2	x						
3						x	

### Intended Learning Outcomes

#### Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a	1.3d		2.2b		2.4b	2.5 a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Work design and Ergonomics	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]
2	Methods Engineering and Graphical tools for Operations Analysis	CLO 1,2	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1] , [2]
3-4-5	Motion/Methods Study and Work Design	CLO 2, 3	Exercises, Assignment	Lecture presentation, in-class discussion	Reading [1] , [2]

6-7	NIOSH Lifting Equation	CLO 2, 3	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [3]
8-9	<b>Midterm</b>				
10	Introduction to Time Study	CLO 1		Lecture presentation, in-class discussion	Reading [1]
11-12	Direct Time Study	CLO 2, 3	Quiz, Exercises	Lecture presentation, in-class discussion	Reading [1], [2]
13-14	Predetermined Motion Time Systems	CLO 2, 3	Exercises, Assignment	Lecture presentation, in-class discussion	Reading [1], [2]
15-16	Ergonomics and Human Factors	CLO 1, 2, 3	Exercises	Lecture presentation, in-class discussion	Reading [1], [2]
17	Learning Curves	CLO 1		Lecture presentation, in-class discussion	Reading [1]
8 weeks	<i>Laboratory 1</i> (1 week) Measurement of Grip strength  <i>Laboratory 2</i> (1 week) Measurement of working environment factors  <i>Laboratory 3</i> (1 week) Introducing the Ergonomics software  <i>Laboratory 4</i> (2 week) Work Design  <i>Laboratory 5</i> (2 week) Motion study and Time study  <i>Laboratory 6</i> (1 week) Design Layout	CLO 3	Practices		
18	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class assignment (10%)	Quiz 60% Pass	Group Assignment 60% Pass	
Group Lab (20%)			Group Lab 80% Pass

Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Clearly identify the problems and the purpose	10		
Introduction demonstrates thorough knowledge of relevant background	10		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>			
	10		
<b>TOTAL SCORE</b>			
	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.



	the presentation cohesive.			
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: August 22th, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**  
*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: Product design and development**Course Code: **IS034IU****1. General information**

<b>Course designation</b>	Product Design and Development course introduces to the students the role of multiple functions in creating a new product (e.g. marketing, finance, industrial design, engineering, production) as well as tools and methods for product design and development.
<b>Semester(s) in which the course is taught</b>	5
<b>Person responsible for the course</b>	Dr. Dao Vu Truong Son
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, Exercises, Assignment.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	Nil

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Product Design and Development course introduces to the students the role of multiple functions in creating a new product (e.g. marketing, finance, industrial design, engineering, production) as well as tools and methods for product design and development. Highlight of the course is the project in which the students will design a new product and produce a prototype version of it. Project ideas come from the students in the class and project teams are formed based on expressed student preferences. Throughout the project, the students will apply their learned principles and methods of product development in a realistic context. The course also enables the students to coordinate interdisciplinary tasks in order to achieve a common objective.																																
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:																																
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																															
	<b>Knowledge</b>	<b>CLO1. Understanding the role of multiple functions in creating a new product</b> <b>CLO2. Understand the product development process.</b>																															
	<b>Skill</b>	<b>CLO3. Applying in design a new product and produce a prototype version</b>																															
	<b>Attitude</b>	<b>CLO4. Students will have positive attitude in both self-learning and group discussion with other disciplines related to engineering mechanic related problems.</b>																															
<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td><b>Introduction to Product design &amp; Development</b></td> <td>3</td> <td>I, T</td> </tr> <tr> <td><b>Identify Customer needs</b></td> <td>3</td> <td>I, T</td> </tr> <tr> <td><b>Project selection Product planning</b></td> <td>3</td> <td>I, T</td> </tr> <tr> <td><b>Product specifications</b></td> <td>3</td> <td>I, T</td> </tr> <tr> <td><b>Product architecture.</b></td> <td>3</td> <td>I, T</td> </tr> <tr> <td><b>Concept generation/selection/testing</b></td> <td>9</td> <td>T, U</td> </tr> <tr> <td><b>Prototyping</b></td> <td>3</td> <td>I, T</td> </tr> <tr> <td><b>Industrial design/Design for Manufacturing</b></td> <td>3</td> <td>I, T</td> </tr> <tr> <td><b>Product development economics</b></td> <td>3</td> <td>I, T</td> </tr> </tbody> </table>			Topic	Weight	Level	<b>Introduction to Product design &amp; Development</b>	3	I, T	<b>Identify Customer needs</b>	3	I, T	<b>Project selection Product planning</b>	3	I, T	<b>Product specifications</b>	3	I, T	<b>Product architecture.</b>	3	I, T	<b>Concept generation/selection/testing</b>	9	T, U	<b>Prototyping</b>	3	I, T	<b>Industrial design/Design for Manufacturing</b>	3	I, T	<b>Product development economics</b>	3	I, T
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<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	Karl T. Ulrich & Steven D. Eppinger, Product design & development – 5th Edition, McGraw-Hill, 2012.

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-6) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2		x					
3			x	x			
4					x	x	

### *Intended Learning Outcomes*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3	1.1b 1.1c		1.3a 1.3c					2.5b	2.6a 2.6b
4	1.1c	1.2a	1.3b 1.3d		2.2b		2.4b	2.a	2.6a

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Product design & Development	1	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].1
2	Identify Customer needs	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].2
3	Project selection Product planning	2,3	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 3
4	Product specifications	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 4
5	Product architecture.	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 5
6,7	Concept generation/selection	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 6,7
8	Review				
9	Midterm				
10	Concept Testing	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].8
11	Prototyping	1,2	Exercises, HW, Quiz	Lecture, Discussion, Inclass-Quiz	[1].9
12	Industrial design/Design for Manufacturing	3, 4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].10
13	Product development economics	3,4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].11
14	Project presentation	3,4			
18	Final exam				

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Project (30%)			50% Pass	50% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (65%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (5%)</b>			
	05		
<b>TOTAL SCORE</b>			
	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

*Source: Association of American Colleges and Universities*

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: April 15, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*



**COURSE SYLLABUS****Course Name: Simulation models in industrial engineering**Course Code: **IS028IU****1. General information**

<b>Course designation</b>	Modeling and analysis of industrial and service systems, modeling perspectives, discrete event and continuous simulation, model building using ARENA/SIMAN, statistical aspects of simulation.
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Dr. Pham Huynh Tram
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsive
<b>Teaching methods</b>	Lecture, project
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (lecture):45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>	Engineering Probability and Statistics																			
<b>Course objectives</b>	<ol style="list-style-type: none"> <li>1. Identify, formulate and solve complex problems in manufacturing and service systems by performing discrete-event system simulation and applying knowledge of statistics</li> <li>2. Use simulation as a tool in the process of engineering design to produce solutions that meet specified needs with consideration of economic factors.</li> <li>3. Conduct experimentation via simulation, analyze the data and draw valid conclusion</li> <li>4. Work effectively in group project</li> </ol>																			
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td>CLO1. Able to apply knowledge of statistics such as random distributions and hypothesis testing in different steps of a simulation study</td> </tr> <tr> <td><b>Knowledge</b></td> <td>CLO2.1 Able to carry out simulation study of manufacturing or service cases following a standard procedure</td> </tr> <tr> <td><b>Skill</b></td> <td>CLO2.2 Able to use Arena software as a tool to create a simulation model</td> </tr> <tr> <td><b>Knowledge</b></td> <td>CLO2.3 Able to consider different system constraints, requirements and economic factors in a simulation study</td> </tr> <tr> <td><b>Skill</b></td> <td>CLO3. Able to do experimentation in simulation in Arena, read and interpret the report results</td> </tr> <tr> <td><b>Attitude</b></td> <td>CLO4.1 Able to collaborate and/or lead in a project team, plan tasks and meet project objectives</td> </tr> <tr> <td><b>Skill</b></td> <td>CLO4.2 Able to write a technical report</td> </tr> <tr> <td><b>Skill</b></td> <td>CLO4.3 Able to give presentation before class</td> </tr> </tbody> </table>		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	CLO1. Able to apply knowledge of statistics such as random distributions and hypothesis testing in different steps of a simulation study	<b>Knowledge</b>	CLO2.1 Able to carry out simulation study of manufacturing or service cases following a standard procedure	<b>Skill</b>	CLO2.2 Able to use Arena software as a tool to create a simulation model	<b>Knowledge</b>	CLO2.3 Able to consider different system constraints, requirements and economic factors in a simulation study	<b>Skill</b>	CLO3. Able to do experimentation in simulation in Arena, read and interpret the report results	<b>Attitude</b>	CLO4.1 Able to collaborate and/or lead in a project team, plan tasks and meet project objectives	<b>Skill</b>	CLO4.2 Able to write a technical report	<b>Skill</b>	CLO4.3 Able to give presentation before class
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<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	<b>Introduction to Design of Experiments</b> <i>Strategy, applications, guidelines and basic principles</i>	<b>1</b>	<b>I</b>
	<b>Review of Basic Statistical Methods</b> <i>Sampling</i> <i>Inferences about the differences in means</i> <i>Inferences about the variances of normal distribution</i>	<b>1</b>	<b>I</b>
	<b>Analysis of Variance</b> <i>Single-factor analysis of variance</i> <i>Model adequacy checking</i> <i>Interpreting of the results</i> <i>Sample computer output</i> <i>Determining sample size</i> <i>Dispersion effects</i> <i>Regression approach</i> <i>Real economy application of a designed experiment</i>	<b>1</b>	<b>I</b>
	<b>Experiments with Blocking Factors</b> <i>Randomized block</i> <i>Latin square design</i> <i>Incomplete block designs</i>	<b>2</b>	<b>T,U</b>
	<b>Factorial Experiments</b> <i>Basic definitions and principles</i> <i>Two factors factorial design</i> <i>Blocking in factorial experiments</i>	<b>1</b>	<b>T, U</b>
<b>Two-level Factorial Designs</b> <i>The 2<sup>2</sup> design, the 2<sup>3</sup> design</i> <i>The general 2<sup>k</sup> design</i> <i>Single replicate of the 2<sup>k</sup> design</i>	<b>1</b>	<b>T,U</b>	
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	<b>Two-level Fractional Factorial Designs</b> <i>One-half fraction of the 2<sup>k</sup> design</i> <i>One quarter fraction of the 2<sup>k</sup> design</i> <i>Blocking fractional factorials</i>	2	T,U
	<b>Regression Modeling</b> <i>Linear regression models</i> <i>Estimation of the parameters</i> <i>Hypothesis testing of the parameters</i>	1	I
	<b>Response Surface Methodology</b> <i>Method of steepest ascent</i> <i>Analysis of a second-order response surface</i> <i>Application to robust design</i>	2	I
<b>Examination forms</b>	Writing, project presentation		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
<b>Reading list</b>	Textbooks: [1] Banks, J., Carson, J. S., Nelson, B. L., and Nicol, D. M., “Discrete-Event System Simulation”, 4th edition, Prentice-Hall, 2005. [2] Kelton, W. D., Sadowski, R. P., and Sturrock, D. T., “Simulation with Arena”, McGraw-Hill, New York (fourth edition), 2006. References: [3] Tayfur Altioik, Benjamin Melamed, “Simulation modeling and analysis with Arena”, Academic Press (Elsevier) 2007 Software: ARENA Software version: 16.00 Licenses: Academic for students, unlimited		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-6) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2		x					
3						x	
4			x		x		

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
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7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1c		1.3a 1.3b						2.6a

## 3. Planned learning activities and teaching methods

### *Theory*

Week	Content	CLOs	Assessment	Resources

1	Introduction	2.1	Project	Reading: Banks – Chapter 1 (Kelton – Chapter 1 Altiok – Chapter 1)
2	Simulation examples in a spreadsheet	2.1	Midterm	Reading: Banks – Chapter 2 (Kelton – Chapter 2)
3	Basics of discrete-event simulation	2.1		Reading: Banks – Chapter 3 Kelton – Chapter 2
4	Elements of Probability and Statistics	1		Reading: Banks-Chapter 5 Altiok- Chapter 3
5	Random Numbers	1	Midterm	Reading: Banks-Chapter 7 (Altiok- Chapter 4)
6	Random variates	1	Midterm	Reading: Banks-Chapter 7 (Altiok- Chapter 4)
7	Review			
<b>Midterm exam</b>				
8&9	Input modeling	1 2.1	Project Final	Reading: Banks – Chapter 9 Kelton – Chapter 4.6 Altiok – Chapter 7
9&10	Verification and validation	1 2.1	Project Final	Reading: Banks – Chapter 10 Kelton – Chapter 4.5 Altiok – Chapter 8
11&12	Absolute Output analysis	1 2.1 2.3	Project Final	Reading: Banks – Chapter 11 Kelton – Chapter 7 Altiok – Chapter 9
13	Relative Output analysis	1 2.1 2.3	Project Final	Reading: Banks – Chapter 12 Kelton – Chapter 6 Altiok – Chapter 9
14	Presentation	4		
15	Review			
<b>Final exam</b>				

**Laboratory**

Week	Content	CLOs	Assessment	Resources
1a	<p><b>Introduction</b> Introduction to Arena (Arena Window)</p> <p>Example: A Simple Process System</p> <ul style="list-style-type: none"> <li>• Flowchart Module: Create, Process, Dispose</li> <li>• Data Module: Entity, Resource, Queue;</li> <li>• Viewing report</li> </ul>	2.2	HW Midterm	-Reading: Kelton – Chapter 3 (Model 3-1)
1b	<p><b>Modeling Production Lines</b></p> <p>Example: An Electronic Assembly &amp; Test System</p> <ul style="list-style-type: none"> <li>• Flowchart Module: Assign, Decide, Record</li> <li>• Data Module: Variables, Attributes, Expression, Schedule, Failure, Statistics</li> <li>• Viewing Report</li> </ul>	2.2 3	HW Midterm	-Reading: Kelton – Chapter 3 (Model 4-1, 4-2)
2	<p><b>Modeling Production Line (cont)</b> Example: Other types of production lines: packaging, batch processing, assembly</p> <p>-Flowchart Module: Hold, Batch, Separate, Match</p>	2.2 3	HW Midterm Quiz	-Reading: Altiok – Chapter 11
3	<p><b>Modeling Service system</b> Example: A call center</p>	2.2 3	HW Midterm	-Reading: Kelton – Chapter 5 (Model 5-1)
4	<p><b>Modeling Service system (cont)</b> Example: A call center</p>	2.2 3	HW Midterm Quiz	-Reading: Kelton – Chapter 5 (Model 5-2)
<b>Midterm exam</b>				
5	<p><b>Modeling Supply Chain System</b> Example: An Inventory System</p>	2.2 3	HW Final	-Reading: Altiok – Chapter 12.1

6	<b>Modeling Transportation System</b> Example: A Small Manufacturing System <ul style="list-style-type: none"> <li>Flowchart Module: Station, Route,</li> <li>Data Module: Sequence</li> </ul>	2.2 3	HW Final Quiz	-Reading: Kelton – Chapter 7 (Model 7.1)
7	<b>Modeling Transportation System</b> Example: A small Manufacturing System with Entity Transfer	2.2 3	HW Final	-Reading: Kelton – Chapter 8 (Model 8.1)
8	<b>Other techniques in Arena</b> <ul style="list-style-type: none"> <li>Input data</li> <li>DOE</li> <li>Optimization</li> </ul>	2.2 3	HW Final Quiz	-Reading: Kelton – Chapter 10, 6
<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Project (10%)	x	x	x	x
Homework (20%) Quiz (10%)		x	x	
Midterm exam (30%) - Theory (18%) - Lab (12%)	x	x	x	
Final exam -Theory (18%) - Lab (12%)	x	x	x	

Note: %Pass: Target 70% of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		
<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		



<b>Analysis and discussion demonstrate good subject mastery</b>	<b>30</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		
<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

## 6. Date revised: April 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: SCHEDULING & SEQUENCING**Course Code: **IS027IU****1. General information**

<b>Course designation</b>	
<b>Semester(s) in which the course is taught</b>	2
<b>Person responsible for the course</b>	<i>Dr. Phan Nguyen Ky Phuc</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	<i>Compulsory</i>
<b>Teaching methods</b>	<i>Lecture, lesson, project</i>
<b>Workload (incl. contact hours, self-study hours)</b>	<i>(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours<sup>1</sup>:</i>
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	<p>This course gives an introduction to scheduling problems: techniques, principles, algorithms and computerized scheduling systems. Topics include scheduling algorithms for single machine, parallel machine, flow shop, job shop and also solution methodologies such as heuristic procedures, constructive algorithms, branch and bound approaches, and genetic algorithms.</p>																																				
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td> <p>CLO1 Students are able to master the basic knowledge of modeling different shop configurations, manufacturing scheduling problems, and performance measures.</p> <p>CLO2. Students are able to master the basic knowledge of identifying basic algorithms and procedures to use in different shop configurations.</p> <p>CLO3. Students are able to use different methods to solve engineering tasks by selecting different available methodologies in manufacturing and service scheduling problems.</p> </td> </tr> <tr> <td><b>Skill</b></td> <td> <p>CLO4 Students are able to apply their knowledge and develop practical skills for solving problems, by using LINGO, CPLEX, Python software</p> </td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	<b>Knowledge</b>	<p>CLO1 Students are able to master the basic knowledge of modeling different shop configurations, manufacturing scheduling problems, and performance measures.</p> <p>CLO2. Students are able to master the basic knowledge of identifying basic algorithms and procedures to use in different shop configurations.</p> <p>CLO3. Students are able to use different methods to solve engineering tasks by selecting different available methodologies in manufacturing and service scheduling problems.</p>	<b>Skill</b>	<p>CLO4 Students are able to apply their knowledge and develop practical skills for solving problems, by using LINGO, CPLEX, Python software</p>																														
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<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p><b>Weight: lecture session (3 hours)</b></p> <p><b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b></p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td><b>Introduction to Scheduling</b></td> <td><b>1</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>How to build constraints</b></td> <td><b>2</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>CPLEX software</b></td> <td><b>2</b></td> <td><b>U</b></td> </tr> <tr> <td><b>PERT model</b></td> <td><b>1</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Single Machine Dispatching Rule Model</b></td> <td><b>2</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Scheduling with Workforce Constrain</b></td> <td><b>2</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Job shop scheduling- Exact Math Model</b></td> <td><b>2</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Job shop scheduling- Shifting Bottle Neck</b></td> <td><b>1</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Scheduling of Flexible Assembly Systems</b></td> <td><b>1</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Scheduling in Flexible Flowshop and Jobshop</b></td> <td><b>1</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Workforce Scheduling</b></td> <td><b>1</b></td> <td><b>I, T</b></td> </tr> </tbody> </table>	Topic	Weight	Level	<b>Introduction to Scheduling</b>	<b>1</b>	<b>I, T</b>	<b>How to build constraints</b>	<b>2</b>	<b>I, T</b>	<b>CPLEX software</b>	<b>2</b>	<b>U</b>	<b>PERT model</b>	<b>1</b>	<b>I, T</b>	<b>Single Machine Dispatching Rule Model</b>	<b>2</b>	<b>I, T</b>	<b>Scheduling with Workforce Constrain</b>	<b>2</b>	<b>I, T</b>	<b>Job shop scheduling- Exact Math Model</b>	<b>2</b>	<b>I, T</b>	<b>Job shop scheduling- Shifting Bottle Neck</b>	<b>1</b>	<b>I, T</b>	<b>Scheduling of Flexible Assembly Systems</b>	<b>1</b>	<b>I, T</b>	<b>Scheduling in Flexible Flowshop and Jobshop</b>	<b>1</b>	<b>I, T</b>	<b>Workforce Scheduling</b>	<b>1</b>	<b>I, T</b>
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<b>Examination forms</b>	<b>Written Exam</b>
<b>Study and examination requirements</b>	<p><b>Attendance:</b> A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p><b>Assignments/Examination:</b> Students must have more than 50/100 points overall to pass this course.</p>
<b>Reading list</b>	<p><b>Textbooks:</b></p> <p>[1] M. L. Pinedo, Scheduling: Theory, Algorithms, and Systems, 3rd edition, Springer, 2008.</p> <p><b>References:</b></p>

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	X						
2	X						
3						X	
4						X	

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze*

*and interpret data, and use engineering judgment to draw conclusions*

7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Scheduling	1		Lecture	
2 & 3	How to build constraints	2,3	HW1	Lecture Think pair-share HW	
4&5	CPLEX software	4	Quiz1	Lecture Quiz	
6	PERT model	2,3	HW2	Lecture HW	
7&8	Single Machine Dispatching Rule Model	2,3	HW3	Lecture HW	
9	<b>Midterm</b>				
10	Scheduling with Workforce Constraint	2,3		Lab	
11	Job shop scheduling- Exact Math Model	2,3	Quiz2	Lecture Quiz	

12	Job shop scheduling- Shifting Bottle Neck	2,3		Lecture HW	
13&14	Scheduling of Flexible Assembly Systems	2,3	HW4	Lecture HW Group Project	
15	Scheduling in Flexible Flowshop and Jobshop	2,3	Quiz3	- Lecture Quiz	
16	Workforce Scheduling	2,3			
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes (10%)	Qz1 60% Pass		Qz3 60% Pass	... ...%Pass
Howework exercises (20%)	HW1 50% Pass	HW2 50% Pass	HW3 50% Pass	HW4 50%Pass
Midterm (30%)		60% Pass		
Final (40%)			60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Part 1..... (...%)</b>			
<b>Criterion 1:</b>			
<b>Criterion 2:</b>			
<b>Criterion 3:</b>			
<b>Criterion ....:</b>			



<b>Part 2..... (....%)</b>			
<b>Criterion 1 ...:</b>			
<b>Criterion ...:</b>			
<b>Part 3..... (....%)</b>			
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<b>Criterion ...:</b>			
<b>Part ..... (....%)</b>			
<b>TOTAL SCORE</b>	<b>100</b>		

### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
<b>5</b>	<b>Demonstrates complete understanding of the problem. All requirements of task are included in response</b>
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<b>3</b>	<b>Demonstrates partial understanding of the problem. Most requirements of task are included.</b>
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<b>1</b>	<b>Demonstrates no understanding of the problem.</b>
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Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

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<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and

	polished and confident.	comfortable.	speaker appears tentative.	speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

## 6. Date revised:

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and Management*

*(Signature)*

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: INVENTORY MANAGEMENT**Course Code: **IS023IU****1. General information**

<b>Course designation</b>	This course is essential for students to have a thorough understanding of the philosophy, tools and techniques of inventory management. This course is aimed at providing the background and skills necessary for effective inventory management using a systems approach for an entire supply chain management. This course will cover the following contents: inventory models for deterministic demands, inventory models for stochastic demands, coordinated ordering, and inventory models for multiechelon systems.
<b>Semester(s) in which the course is taught</b>	1
<b>Person responsible for the course</b>	Assoc. Prof. Nguyen Van Hop
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, lesson, project
<b>Workload (incl. contact hours, self-study hours)</b>	<i>(Estimated) Total workload:45</i> <i>Contact hours (please specify whether lecture, exercise, laboratory session, etc.):42 lecture hours.</i> <i>Private study including examination preparation, specified in hours<sup>1</sup>: 3 hours for project presentation</i>
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>									
<b>Course objectives</b>	<p>This course aims to provide for student to:</p> <ul style="list-style-type: none"> <li>● Students understand basic concepts and key aspects of inventory</li> <li>● Students understand the importance of inventory and its position within logistics and supply chain systems</li> <li>● Students understand fundamental inventory control models (deterministic vs stochastic, single item vs multiple items, etc.)</li> <li>● Students know how to determine when to re-order, safety stock level, and order quantity when demand is deterministic</li> <li>● Students know how to determine when to re-order, safety stock level, and order quantity when demand is stochastic</li> </ul>								
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td>CLO1. Understanding of concepts, key points, and primary challenges of inventory management based on Engineering, Scientific, and Economic knowledge. Able to build the framework to control and manage inventory system. Able to identify different issues and problems, and develop the KPIs to measure the performance to control and manage an inventory system.</td> </tr> <tr> <td><b>Skill</b></td> <td>CLO2. Apply engineering methods and holistic and systematic approaches to identify, formulate and solve different inventory control problems by using optimization tools and advanced knowledge of natural sciences, mathematics and engineering. Students are able to collect input data, analyze parameters, formulate and solve practical inventory problems, conduct detailed research, conduct experiments and analyze the solutions by evaluating, planning, choosing and applying adequate methods of modeling, simulation, design and implementation of technical and economic systems.</td> </tr> <tr> <td><b>Attitude</b></td> <td>CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.</td> </tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	CLO1. Understanding of concepts, key points, and primary challenges of inventory management based on Engineering, Scientific, and Economic knowledge. Able to build the framework to control and manage inventory system. Able to identify different issues and problems, and develop the KPIs to measure the performance to control and manage an inventory system.	<b>Skill</b>	CLO2. Apply engineering methods and holistic and systematic approaches to identify, formulate and solve different inventory control problems by using optimization tools and advanced knowledge of natural sciences, mathematics and engineering. Students are able to collect input data, analyze parameters, formulate and solve practical inventory problems, conduct detailed research, conduct experiments and analyze the solutions by evaluating, planning, choosing and applying adequate methods of modeling, simulation, design and implementation of technical and economic systems.	<b>Attitude</b>	CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.
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<b>Attitude</b>	CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.								

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	Introduction to inventory management	1	I
	Inventory models for single item with time varying demand at approximate level	1	I, T, U
	Losizing models with time varying demand	2	I, T, U
	Inventory Management under Stochastic Demand	2	I, T, U
	Managing Class A Items	2	I, T, U
	Perisable Items	2	I, T, U
Multiple Items: Coordinated Ordering	2	I, T, U	
Multi-echelon Inventories	2	I, T, U	
<b>Examination forms</b>	Written Examination		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/ Examination: Students must have more than 50/100 points overall to pass this course.		
<b>Reading list</b>	Textbooks: - Edward A. Silver, David F. Pyke, Rein Peterson: Inventory Management and Production Planning and Scheduling  References: - Steven M. Bragg- Inventory Accounting a comprehensive guide- Wiley(2005) - Steven Axsater- Inventory Control- Springer(2015) - John A. Muckstadt, Amar Sapra- Principle of Inventory Management – Springer(2010)		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x			x			x
2	x	x				x	
3			x	x	x		

*Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a	2.3a	2.4c	2.5b	2.6b
2	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b		2.4a, 2.4b	2.5a		
3	1.1b, 1.1c		1.3a 1.3b 1.3c					2.5b	2.6a 2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to inventory management	1		Lecture Group forming. Class discussion Read book & lecture 2	
2	Inventory models for single item with time varying demand at approximate level	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 3.	
3	Lotsizing models with time varying demand	1, 2,3,4	Quiz/HW	Lecture Class discussion	

				Read book & lecture 4.	
4	Lotsizing models with time varying demand	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 5.	
5	Inventory Management under Stochastic Demand	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 6.	
6	Inventory Management under Stochastic Demand	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 7	
7	Managing Classs A Items	1, 2,3,4	HW	Lecture Class discussion	
	Midterm		Written Exam		
8	Managing Classs A Items	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 9.	
9	Perisable Items	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 10.	
10	Perisable Items	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 11	
11	Multiple Items: Coordinated Ordering	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 12	
12	Multiple Items: Coordinated Ordering	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 13	
13	Multi-echelon Inventories	1, 2,3,4	Quiz/HW	Lecture Class discussion Read book & lecture 14	
14	Multi-echelon Inventories	1, 2,3,4	Quiz/HW	Lecture Class discussion	
15	Project Presentation	4,5	Project	Group Presentation	
	Final exam		Written Exam		



#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Quizzes and homework (15%)	60% Pass	60% Pass	60% Pass	60% Pass	100% Pass
Project (15%)	60% Pass	60% Pass	60% Pass	60% Pass	100% Pass
Midterm Exam (30%)	60% Pass	60% Pass	60% Pass	60% Pass	90% Pass
Final Exam (40%)	60% Pass	60% Pass	60% Pass	60% Pass	90% Pass

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Semester Project Report			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Part 1. Problem (25%)</b>			
Criterion 1: Problem Statement	10		
Criterion 2: Objectives of Study	5		
Criterion 3: Scope and Limitations	5		
Criterion 4: Literature Review	5		
<b>Part 2. Proposed System Design and Solution (40%)</b>			
Criterion 1: Proposed System	10		
Criterion 2: Proposed Solution	15		
Criterion 3: New Contribution	15		
<b>Part 3. Results and Validation (35%)</b>			
Criterion 1: Results	15		
Criterion 2: Validation	20		
<b>TOTAL SCORE</b>		<b>100</b>	

##### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are

	<b>included in response</b>
<b>4</b>	<b>Demonstrates considerable understanding of the problem. All requirements of task are included.</b>
<b>3</b>	<b>Demonstrates partial understanding of the problem. Most requirements of task are included.</b>
<b>2</b>	<b>Demonstrates little understanding of the problem. Many requirements of task are missing.</b>
<b>1</b>	<b>Demonstrates no understanding of the problem.</b>
<b>0</b>	<b>No response/task not attempted</b>

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: 10/5/2022

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*



**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
**School of Industrial Engineering and Management**

**COURSE SYLLABUS**

**Course Name: MANAGEMENT INFORMATION  
SYSTEMS with ENTERPRISE RESOURCES  
PLANNING APPLICATIONS**

Course Code: **IS040IU**

**1. General information**

<b>Course designation</b>	<i>This subject will provide a broad introduction to business processes, information communication in the organizations, and systems to manage an organization's information resources. The course comes along with a computer software (SAP) to practice, through which students learn about database concepts and business processes integration, emphasizing the Internet based business models to get a competitiveness of global based business environments.</i>
<b>Semester(s) in which the course is taught</b>	1
<b>Person responsible for the course</b>	TBN
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, lesson, project, lab practices.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>	None									
<b>Course objectives</b>	Students will be provided with skills of using software to manage different processes in the enterprise, in order to manage and plan for resources in the enterprise, and be exposed to case studies from outside the classroom. Through this unit, students will gain a deep appreciation for the role of enterprise systems in efficiently managing processes from multiple functional perspectives. Students will be able to apply the real-world concepts discussed upon entering the workforce and will be better prepared to succeed in their careers.									
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td> <b>CLO1. Describe the key processes in the firms supported by modern ERP systems.</b>   <b>CLO2. Explain the roles of ERP systems in managing and planning resources and information system in the firm.</b> </td> </tr> <tr> <td><b>Skill</b></td> <td> <b>CLO3. Carry out actions to apply the concepts covered in the text to real-world situations and to the running case study used in their hands-on exercises, cooperate in group work to complete exercises.</b> </td> </tr> <tr> <td><b>Attitude</b></td> <td> <b>CLO4. Reason around ethical and privacy issues in information system control and apply ethical practices.</b> </td> </tr> </tbody> </table>		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<b>CLO1. Describe the key processes in the firms supported by modern ERP systems.</b>  <b>CLO2. Explain the roles of ERP systems in managing and planning resources and information system in the firm.</b>	<b>Skill</b>	<b>CLO3. Carry out actions to apply the concepts covered in the text to real-world situations and to the running case study used in their hands-on exercises, cooperate in group work to complete exercises.</b>	<b>Attitude</b>	<b>CLO4. Reason around ethical and privacy issues in information system control and apply ethical practices.</b>
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<b>Attitude</b>	<b>CLO4. Reason around ethical and privacy issues in information system control and apply ethical practices.</b>									

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p><b>Weight: lecture and practice session</b></p> <p><b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b></p>		
Topic	Content	Weight (hour)	Level
1. Introduction to Business processes and Enterprise system	<ul style="list-style-type: none"> <li>- Organizational Structure</li> <li>- Business Processes</li> <li>- Enterprise Information System</li> <li>- Introduction to ERP SAP</li> <li>- SAP Logging in and Navigation</li> </ul>	3	I
2. Sales & Distribution	<ul style="list-style-type: none"> <li>- Fulfillment process and Key documents (Inquiry, Quotation, SO, PL, Customer Invoice)</li> <li>- Customer Relation Management</li> </ul>	1	I, T
	SAP Lab 1: Sales and Distribution (SD) – Case Study	2	T, U
3. Production Planning	<ul style="list-style-type: none"> <li>- Production strategies and process</li> <li>- Key documents (Planned Order, BOM, Production Order)</li> </ul>	1	I, T
	SAP Lab 2: Production Planning (PP) – Case Study	2	T, U
4. Inventory and Warehouse Management (IWM)	<ul style="list-style-type: none"> <li>- Goods movement in IM and their financial impacts</li> <li>- Key processes in WM</li> </ul>	1	I, T
	SAP Lab 3: Warehouse Management (WM) and Inventory Management (IM) – Case study	2	T, U
Mini-project 1: ERP Implementation Project Management	<ul style="list-style-type: none"> <li>- Introduction to Project System (PS) - Case study</li> <li>- <b>EITHER</b> Seminar or Corporate visit about Implementing ERP in Business <b>OR</b> Practice project planning and execution</li> </ul>	6	I, T, U
Revision		3	
<b>Midterm Exam</b>			
5. Material Planning	<ul style="list-style-type: none"> <li>- MRP types and process</li> <li>- MRP data and key documents</li> </ul>	1	I, T
	SAP Lab 4: Material Requirement Planning (MRP) – Case study	2	T, U
6. Procurement	<ul style="list-style-type: none"> <li>- Procurement process and Key documents (Purchase Requisition, PO, Vendor Invoice)</li> <li>- Supplier Relation Management</li> </ul>	1	I, T
	SAP Lab 5: Purchasing (MM) – Case Study	2	T, U
7. Financial Accounting and Reporting	<ul style="list-style-type: none"> <li>- Intro to Financial Accounting</li> <li>- Financial reporting throughout procurement process (AR/AP, SO, COGS, Invoices)</li> </ul>	2	I, T

	Mini-project 2: Integrated Processes – Global SCM	- Review Integrated end-to-end process (From SD to Accounting) - Divide groups into Buyers & Sellers in different countries - Practice executing end-to-end processes on SAP.	4	I, T, U
	Mini-project 3: ERP Business Simulation	- Introduction to ERPsim - Divide groups to play the Manufacturing, Logistics, and Retail Game (more info <a href="#">here</a> )	3	I, T, U
	Project presentation	The groups present about one of the 3 mini-projects.	6	
	Review		3	
<b>Final Exam</b>				
<b>Examination forms</b>	Multiple-choice questions, short-answer questions			
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.			
<b>Reading list</b>	[1] Magal, Simha R., and Jeffrey Word. Essentials of business processes and information systems. Wiley Publishing, 2009. [2] Magal, Simha R., and Jeffrey Word. Integrated business processes with ERP systems. Wiley Publishing, 2011 (main textbook). [3] SAP ERP 6.0 with Global Bike Inc practice case, supported by the SAP University Alliances.			

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-7) is shown in the following table:

CLO	PLO/SLO						
	1	2	3	4	5	6	7
1			x				
2			x				
3					x		
4				x			

*ABET\_Student Outcomes*

*Criteria for Accrediting Engineering Programs, 2020-2021*



1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	1. Introduction to Business processes and Enterprise system	CLO 1, 2	Quiz	Lecture	Reading [1] – Chap 1 & 2 Reading [2] – Chap 1 & 2
2	2. Sales & Distribution	CLO 1, 3	Homework	Lecture Software Demonstration	Reading [1] – Chap 4 Reading [2] – Chap 5
3	3. Production Planning	CLO 1, 3	Homework	Lecture Software Demonstration	Reading [1] – Chap 5 Reading [2] – Chap 6
4	4. Inventory & Warehouse Management (IWM)	CLO 1, 3	Homework	Lecture Software Demonstration	Reading [2] – Chap 7
5-6	Mini-project 1: ERP Implementation Project Management	CLO 1, 2, 3, 4	Quiz Report	Lecture In-class Discussion Seminar/Corporate visit (optional)	Contact business partner
7	Midterm Review	CLO 1, 2, 3, 4	Quiz	In-class Discussion	
8-9	Midterm				

10	5. Material Planning	CLO 1, 3	Homework	Lecture Software Demonstration	Reading [2] – Chap 8
11	6. Procurement	CLO 1, 3	Homework	Lecture Software Demonstration	Reading [1] – Chap 3 Reading [2] – Chap 4
12	7. Financial Accounting and Reporting Mini-project 2: Integrated Processes – Global SCM	CLO 1, 2, 3, 4	Quiz	Lecture	Reading [1] – Chap 6 Reading [2] – Chap 3& 9
13	Mini-project 2 (con't)	CLO 1, 2, 3, 4	Report	In-class Discussion Software Demonstration	Reading [2] – Chap 9 Reading [3]
14	Mini-project 3: ERP Business Simulation	CLO 1, 2, 3, 4	Report	Lecture In-class Discussion Software Demonstration	To be given by SAP Uni Alliance after purchasing license
15-16	Project Presentation	CLO 1, 2, 3, 4	Presentation Materials and Report	Project Presentation	
17	Final Review				
18	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class assignment (10%)	Quiz 60% Pass	Quiz 60% Pass		
Group mini projects (20%)		Mini project 1,2,3 50% Pass	Mini project 1,2,3 50% Pass	Mini project 1,2,3 50% Pass
Midterm exam (30%)	Q1 50% Pass	Q2 50% Pass	Q3 50% Pass	Q4 50% Pass
Final exam (40%)	Q1 50% Pass	Q2 50% Pass	Q3 50% Pass	Q4 50% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports	
Student: .....	HW/Assignment: .....
Date: .....	Evaluator: .....

	Max.	Score	Comments
<b>Technical content (60%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		
<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		
<b>Analysis and discussion demonstrate good subject mastery</b>	<b>30</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		
<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: This rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and

	polished and confident.	comfortable.	speaker appears tentative.	speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: February 10, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Head of School of Industrial Engineering  
and Management**  
*(Signature)*



**Dr. Nguyen Van Hop**




Vietnam National University – HCMC  
International University  
**School of Industrial Engineering and Management**

# **COURSE SYLLABUS**

**Course Code**  
**IS079IU**

**COURSE NAME**  
**SCIENTIFIC WRITING**

**April 2020**

	<b>VIETNAM NATIONAL UNIVERSITY HCMC INTERNATIONAL UNIVERSITY</b> <b>School of Industrial Engineering &amp; management</b>	Code: FormCS1/EV. Issued No: 1.20 Date of issued: 25/02/2020 Total pages: ...
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## COURSE SYLLABUS

### Course Name: Scientific Writing

Course Code: IS079IU

### RECORD OF REVISIONS

No.	Place	Content of revision	Date of revision

	Prepared by	Reviewed by	Approved by
<b>Full name</b>	Dao Vu Truong Son		
<b>Position</b>	Lecturer		
<b>Signature</b>			
<b>Date</b>	02/03/2020		



**1. General Information**

- Course Title
- + Vietnamese: Tiếng Anh Học Thuật
- + English: Scientific Writing
- Course ID: IS079IU
- Course type
  - General
  - Specialization
  - Skills
  - Fundamental
  - Others: .....
  - Project/ Internship/ Thesis
- Number of credits: 2
  - + Lecture: 2
  - + Laboratory: 0
- Prerequisites: Nil
- Parallel Course: Nil
- Previous course: Nil

**2. Course Description**

This course is offered for undergraduate students at ISE Department, IU. It aims to improve students' academic and scientific writing in English, and helps them successfully complete course reports, thesis, dissertations, and articles for publication as well as doing a proper presentation, etc. Upon completion of the course, we hope our students become more effective, more efficient, and more confident writers.

**3. Textbooks and Other Required Materials** (*textbooks and references should be ≤ 5*)

**Textbooks:**

Science Research Writing\_ A Guide for Non-Native Speakers of English, Glassman, Imperial College Press, 2010

**References:**

Engineering your report – from start to finish, L.A. Krishnan, R. Jong, S. Kathpalia and T.M. Kim, Prentice Hall, 2003.

**Software:**

**4. Course goals**

Goals (Gx)	Descriptions	Program Learning Outcomes		Level of Competence
		ABET *	CDIO	
G1	Students write course reports, thesis, dissertations, and articles for	3	3.1,3.2	Understand





	publication.			
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*\* ABET\_Student Outcomes*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

**5. Course learning outcomes (CLOs)**

*Course learning outcomes are described systematically and aligned with course goals. Active verbs are used to describe CLOs and able to measure and observe in a specific context. Teaching modes: I(Introduce); T (teach); U (Utilize).*

<b>CLOs (Gx.x)</b>	<b>Descriptions</b>	<b>Teaching Modes</b>
G1.1	Students write course reports, thesis, dissertations, and articles for publication.	I, T
G1.2	Students can understand other people's papers.	I, T

**6. Course Assessment**

<b>Assessment types</b>	<b>Assessment component</b>	<b>Course learning outcomes (CLOs) (Gx.x)</b>	<b>Percentage %</b>
A1.Process assessment	A1.1 Project	G1.1, G1.2	30
A2.Midterm assessment	A2.1 Midterm Exam	G1.1	30
A3.Final assesement	A3.1 Final Exam	G1.2	40

**7. Course Content**



**Theory**

Week	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecturer	Student	
1&2	Introduction	G1.1	- Lecture presentation	- Group forming. - Textbook, Slides	- Class discussion <b>A1.1</b>
3&4	Literature review	G1.2	- Lecture presentation	- Textbook, Slides	- Class discussion <b>A1.1</b>
5&6&7	Describing methods, materials and processes	G1.1, G1.2	- Lecture presentation	- Textbook, Slides	- Class discussion <b>A1.1</b>
<b>Midterm exam</b>					<b>A2</b>
8&9&10	Presenting results and other visualization techniques	G1.1 G1.2	- Lecture presentation	- Textbook, Slides	- Class discussion <b>A1.1</b>
10&11	Writing abstract and conclusion				
12&13	Poster and oral presentation	G1.1 G1.2	- Lecture presentation	- Textbook, Slides	- Class discussion <b>A1.1</b>
14	Final presentation	G1.1 G1.2	- Lecture presentation	- Textbook, Slides	- Class discussion <b>A1.1</b>
15	Review for Final Exam		- Problems solving		- Class discussion <b>A1.1</b>
<b>FINAL EXAMINATION</b>					<b>A3</b>

**Laboratory**

Week	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecturer	Student	
1					
2					

**8. Course requirement and expectation**

**Class Participation:** A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and



comments are strongly encouraged.

**Academic Honesty and Plagiarism:** Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

## 9. Instructor information

<b>Department/Office</b>	School of Industrial Engineering & Management-International University, VNU-HCMC
<b>Address</b>	A2.504 – Quarter 6, Linh Trung Ward, Thu Duc District, HCMC
<b>Phone number</b>	
<b>Instructor 's name</b>	Dao Vu Truong Son
<b>Email</b>	dvtson@hcmiu.edu.vn

*Ho Chi Minh City, 02/03/2020*  
**Dean of Faculty/Department**

Dr. Nguyen Van Hop

**COURSE SYLLABUS****Course Name: CAPSTONE I**

Course Code: IS111IU

**1. General information**

<b>Course designation</b>	<p><i>This subject is a preparation step for thesis and helps student to review their jobs after internship 2. It also helps students know how to identify the problem, review related literatures, and develop initial system for solving the current problem of a case.</i></p> <p><i>Capstone Design I is the first part of the capstone sequence. Its primary purpose is to introduce students to the concepts, methodologies, and initial stages of a comprehensive design project.</i></p> <p><i>Students typically engage in problem identification, project planning, and preliminary research. Students define the scope and objectives of their design project, identify potential solutions, and conduct initial feasibility studies.</i></p>
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Assoc. Prof. Nguyen Van Hop
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Project
<b>Workload (incl. contact hours, self-study hours)</b>	<p>(Estimated) Total workload: 45</p> <p>Contact hours: 15 (advising discussion)</p> <p>Private study including report and presentation preparation, specified in hours<sup>1</sup>: 30</p>

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Credit points</b>	3 (5 ECTS)	
<b>Required and recommended prerequisites for joining the course</b>		
<b>Course objectives</b>	<p>Capstone project is a semester-long course taken at the senior year. Students engage in a research project focused on economic, social and environmental problems to study a current system, identify the possible problem, and explore in literature published research achievements in a research field that students have already agreed upon with potential thesis advisors in order to support and develop in thesis later. This research is individual work. Students and advisors meet to discuss together as much as needed. In the result, students typically present their project proposals, preliminary design concepts and a prototype module or system with the basic level requirements that it can improve and develop in capstone II or the thesis. They've set the stage for their design project and have a clear direction for moving forward.</p>	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	
	<b>Skill</b>	<p><b>CLO1. Know how to study a current system. Know how to identify a specific problem that related to the economic, social and environmental consideration.</b></p> <p><b>CLO2. Apply engineering methods and holistic and systematic approaches to formulate and solve practical problem. Be able to conduct literature review related to the specific topic, collect sources information and analyze parameters, evaluate, choose, and apply adequate methods of modeling, simulation, design and implementation of technical and economic systems. Be able to develop a prototype system or an initial solution of the problem and conduct experiments and analyze the solutions using optimization tools and advanced knowledge of natural sciences, mathematics and engineering.</b></p>
<b>Attitude</b>	<p><b>CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment. No cheating, regular meetings, team working, on-time reports. Be able to report and defend their research in both writing and speaking format.</b></p>	

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	Select the research topics and determine the case study.	1 hr	I, U
	Identify the specific problem, objective of study and scopes.	3 hrs	I, U
	Search the related papers in research field and make literature review.	6 hrs	I, U
	Develop the system to figure out the solution for the studied problem	8 hrs	U
	Implement the solution method	12 hrs	U
<b>Examination forms</b>	Presentation, Report.		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the weekly meetings. Students will be assessed on the basis of their working outputs. Examination: Students must have more than 50/100 points overall to pass this course.		
<b>Reading list</b>	Textbooks: - Depending on specific problems References: - Published scientific articles and technical documents		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x			x			
2	x	x				x	x
3			x	x	x		

### *Intended Learning Outcomes (ILO)*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider*

*the impact of engineering solutions in global, economic, environmental, and societal contexts*

5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1b	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	<b>2.2a</b>			2.5b, 2.6b	
2	<b>1.1a,1.1b,1.1c</b>	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b	<b>2.3a</b>	2.4c		
3	1.1b,1.1c		1.3a, 1.3b,1.3c					2.5b	2.6a, 2.6b

### 3. Planned learning activities and teaching methods

It depends on the individual work between students and advisors, including main contents:

- Problem definition: Students select a problem or project topic, often with real-world relevance.
- Research and analysis: Initial research to understand the problem, user needs, constraints, and potential solutions.
- Project proposal: Developing a detailed proposal that outlines the problem, objectives, approach, and initial concepts.
- Ideation: Generating initial design ideas and concepts.
- Preliminary design: Creating preliminary sketches, models, or prototypes to illustrate design directions.
- Feasibility assessment: Evaluating the technical, economic, and practical feasibility of proposed solutions. Presenting the project to committee

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Final Report (80%)	Final Report 60% Pass	Final Report 60% Pass	Final Report 60% Pass
Final Presentation (20%)	60% Pass	60% Pass	Final Presentation 60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist			
Student: .....		Topic: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Chapter 1: Introduction (15%)</b>			
Criterion 1: Problem statement	5		
Criterion 2: Objectives of Study	5		
Criterion 3: Scope and Limitations	5		
<b>Chapter 2: Literature Review (15%)</b>			
Criterion 1: Current System	2		
Criterion 2: Related Works	10		
Criterion 3: Research Gap(s) and Key Ref.	3		
<b>Chapter 3: Proposed System (30%)</b>			
Criterion 1: Methodology Selection	15		
Criterion 2: Proposed Solution	15		
<b>Chapter 4: Implementation and Validation (30%)</b>			
Criterion 1: Solution Implementation	15		
Criterion 2: Validation	15		
<b>Chapter 4: Report and Presentation (10%)</b>			
Criterion 1: Report	5		
Criterion 2: Presentation	5		
<b>TOTAL SCORE</b>		<b>100</b>	

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response



<b>4</b>	<b>Demonstrates considerable understanding of the problem. All requirements of task are included.</b>
<b>3</b>	<b>Demonstrates partial understanding of the problem. Most requirements of task are included.</b>
<b>2</b>	<b>Demonstrates little understanding of the problem. Many requirements of task are missing.</b>
<b>1</b>	<b>Demonstrates no understanding of the problem.</b>
<b>0</b>	<b>No response/task not attempted</b>

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

**6. Date revised: 10/5/2022**

*Ho Chi Minh City, 10/08/2023*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: Lean Production**Course Code: **IS041IU****1. General information**

<b>Course designation</b>	This course will help students to understand the concepts and philosophies of lean, get familiar with lean tools/techniques, especially the concepts behind the tools/techniques used, and develop analytical, problem solving skills. Therefore, the students will be able to join well in most of foreign-invested enterprises or large organizations in Vietnam after graduation. Ultimately, they will be able to apply lean philosophy creatively in each unique practical situation.
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Dr. Tran Duc Vi
<b>Language</b>	English
<b>Relation to curriculum</b>	Specialization
<b>Teaching methods</b>	Lecture, project
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (lecture):45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	<ol style="list-style-type: none"> <li>1. Understand different kinds of production and the background and philosophies of lean production, analyzing existing systems and identify different kinds of waste</li> <li>2. Apply approaches used in implementing lean production such as 5S, stability, pull production, cellular arrangement and layout improvement, quick change, total productive maintenance, mistake reduction, standards, leveling, visual management to real-life problems</li> </ol>																																							
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<b>Examination forms</b>	Writing, project presentation
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	<p><b>Textbook:</b></p> <p>[1] Toyota Production System: An Integrated Approach to Just-In-Time, 4th Edition, Yasuhiro Monden.</p> <p><b>Other references:</b></p> <p>[2] Lean thinking: Banish waste and create wealth in your corporation, James Womack &amp; Daniel Johns, Free Press, 2003</p> <p>[3] The Toyota way, Jeffrey Liker, McGraw-Hill, 2004</p> <p>[4] The machine that changed the world, James Womack, Daniel Johns and Daniel Roos, Rawson Associates, 1990</p> <p>[5] Lean production simplified, Pascal Dennis</p> <p>[6] Seeing the whole, Dan John, Jim Womark</p> <p>[7] Learning to see, Dan John, Jim Womark</p> <p>[8] Total Productive Maintenance, Steven Borris, McGraw-Hill, 2006</p>

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-2) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x	x				x	
2			x	x	x	x	x

Intended Learning Outcomes (*ABET\_Student Outcomes*)

*Criteria for Accrediting Engineering Programs, 2020-2021*

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
- an ability to communicate effectively with a range of audiences*
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a 2.2b		2.4a 2.4b	2.5a	
2	1.1a 1.1b 1.1c	1.2a	1.3a 1.3b 1.3c 1.3d		2.2b	2.3a	2.4b 2.4c	2.5a 2.5b	2.6a 2.6b

### 3. Planned learning activities and teaching methods

Week	Content	CLOs	Assessment	Learning Activities	Resources
1	The birth of Lean production, house of Lean production, Muda	1.1	HW	Lecture Project group forming Class Discussion Read Book	
2	Value stream mapping	1.1	HW, Midterm	Lecture Class Discussion Read Book	
3	Process stability – 5S, Toyota Productive Maintenance	1.1	HW, Midterm	Lecture Class Discussion Read Book	
4	Standardized work – takt time/ cycle time, work sequence, in-process stock Auditing standardized work	1.1	HW, Midterm	Lecture Class Discussion Read Book	
5	Production smoothing	1.1	HW, Midterm	Lecture Class Discussion Read Book	
6	Cellular manufacturing	2.1	HW, Midterm	Lecture Class Discussion Read Book	
7	Adaptable Kanban system maintains JIT production	2.1	HW, Midterm	Lecture Class Discussion Read Book	
8	Review for Midterm		Quiz	Class Discussion Problem solving	
9	Midterm Exam				
10	Determining the number of Kanban	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
11	How Toyota shortened production lead time	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	

12	Autonomous defects control (Pokayoke)	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
13	Numerical analysis for productivity improvement	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
14	Implementing the TPS	1.2, 2.1	HW, Final	Lecture Class Discussion Read Book	
15	Presentation	2.1, 2.2, 3	Project	Presentation Class Discussion	
16	Review for Final				
17	Final Examination				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2
Project (15%)	x	x
Homework, quiz (15%)		x
Midterm exam (30%)	x	x
Final exam (40%)	x	x

Note: %Pass: Target 70% of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		



<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
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<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
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<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
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Source: Association of American Colleges and Universities

**6. Date revised: June 2022**

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: Quality Management**Course Code: **IS025IU****1. General information**

<b>Course designation</b>	<i>Introduction to the principles of quality management, with an emphasis on cross-functional problem solving. This course will provide a basic understanding of the philosophy, conceptual frameworks, and the tools of the Total Quality Management.</i>
<b>Semester(s) in which the course is taught</b>	1, 2
<b>Person responsible for the course</b>	M.Sc. Duong Vo Nhi Anh
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, lesson, project, seminar.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	Nil

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Understand different kinds of quality tools, PDCA, ... Apply quality tools in problem solving, quality improvement to reduce cost, quality of products																											
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td>CLO 1. Understand different kinds of quality and the background and philosophies of quality CLO 2. Understand method to analyze existing problem and identify different kinds of solutions</td> </tr> <tr> <td><b>Skill</b></td> <td>CLO 3. Apply approaches used in implementing quality tools</td> </tr> <tr> <td><b>Attitude</b></td> <td>CLO 4. Apply for improve standards, quality of products</td> </tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	CLO 1. Understand different kinds of quality and the background and philosophies of quality CLO 2. Understand method to analyze existing problem and identify different kinds of solutions	<b>Skill</b>	CLO 3. Apply approaches used in implementing quality tools	<b>Attitude</b>	CLO 4. Apply for improve standards, quality of products																			
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<b>Examination forms</b>	Multiple-choice questions, short-answer questions																											
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																											

<b>Reading list</b>	<p>[1] D.L. Goetsch and Stanley B. Davis, Quality Management- 5th edition, Prentice Hall, 2006.</p> <p>[2] Howard S. Gitlow et. al., Quality Management - 3rd edition, McGraw Hill, 200</p> <p>[3] Evans, Managing for quality and performance excellence -7th edition, Cengage Learning.</p> <p>[4] Winston, Operations Research – 4th edition, Cengage Learning.</p> <p>[5] Barry Render, Quantitative analysis for management - 9th edition, Prentice Hall, 2006</p>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2	x	x	x				
3						x	
4				x			x

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2	1.1c	1.2a 1.2b	1.3a 1.3c 1.3d	2.1a 2.1b	2.2a		2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1a 1.1b 1.1c		1.3c			2.3a	2.4c	2.5b	2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLOs	Assessment	Learning activities
1	Introduction to Quality Management Fundamentals of quality: process basics, types of quality, relationship between quality and cost and productivity.	CLO 1, 2	- Quiz	- Group forming. - Class discussion - Read book & lecture 2.
2	Why Total Quality Management Definitions and basic principles How to realize TQM: three components of TQM, quality and global competitiveness, environment of today. Why Total Quality Management in a Knowledge-Based Economy? Breaking out of the negative circle	CLO 1, 2	- Quiz - Homework	- Class discussion - Read book & lecture 3.
3	Introducing the Three Pillars of TQM Quality Planning:	CLO 1, 2	- Quiz /HW	- Class discussion - Read book & lecture 4.
4	Behavioral Component of TQM Establishing a quality culture, conditions for a successful TQM policy, increasing the quality of cooperation processes, TQM & the strategy of change, How can the behavioral component be developed?	CLO 1, 2	- Quiz /HW	- Class discussion - Read book & lecture 4.
5	Management components of TQM: Role of Top Management/ Task-oriented meetings. Roadmap to business excellence	CLO 1, 2	- Homework	- Class discussion - Read book & lecture 5.
6	Technical components of TQM: Quality Systems and Quality Assurance Quality tools: ISO, ... .	CLO 1, 2	- Quiz /HW	- Class discussion - Read book & lecture 6.

7	Review	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 6.
8	Technical components of TQM (cont) ISO and other statistical tools. Collection and presentation of data	CLO 1, 2, 3	- Quiz /HW	- Class discussion
	Midterm exam			
9	SPC/SQC: control charts Stabilizing and improving a process with control charts. Variables and attribute control charts. How to read a control chart: 7 rules.	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 7.
10	SPC/SQC: control charts Stabilizing and improving a process with control charts. Variables and attribute control charts. How to read a control chart: 7 rules.	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 8.
11	SPC/SQC: control charts Stabilizing and improving a process with control charts. Variables and attribute control charts. How to read a control chart: 7 rules.	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 8.
12	Standard Operating Procedures (SOP) Quality Function Deployment (QFD)	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 8.
13	Standard Operating Procedures (SOP) Quality Function Deployment (QFD)	CLO 1, 2, 3	- Quiz /HW	- Class discussion - Read book & lecture 9.
14	Group presentation	CLO 1, 2, 3, 4	- Quiz /HW	- Class discussion
15	Review for Final Exam	CLO 1, 2, 3, 4	- Quiz /HW	- Class discussion
	Final Examination			



#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quizzes and homework (15%)	60% Pass	60% Pass	60% Pass	60% Pass
Project (15%)	60% Pass	60% Pass	60% Pass	60% Pass
Midterm Exam (30%)	60% Pass	60% Pass	60% Pass	60% Pass
Final Exam (40%)	60% Pass	60% Pass	60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (10%)	10		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without questioning.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: July 12, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: Project Management**Course Code: **IS026IU****1. General information**

<b>Course designation</b>	This course is developed to provide the principal concept on project management which was characterized by the project management body of knowledge guide (PMBOK Guide). This guide emphasizes the five project process groups of initiating, planning, executing, controlling and closing, and the nine knowledge areas of project integration, scope, time, cost, quality, human resources, communication, risk, and procurement management.
<b>Semester(s) in which the course is taught</b>	4
<b>Person responsible for the course</b>	Tran Van Ly
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, homework.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>	None	
<b>Course objectives</b>	Students will be provided with knowledge and skills of constructing the network (AON & AOA), GANNT Chart, solving the network; Resource allocation, resource loading & levelling; Project budgeting & cost estimation, risk management; Project quality management; Project human resource management; Project procurement management; Project executing, monitoring & control to closing the project	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<p><b>CLO1. Able to align the project to the organization's strategic plans and business justification throughout its lifecycle; to identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders.</b></p> <p><b>CLO2. Able to manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders</b></p> <p><b>Able to implement general business concepts, practices, and tools to facilitate project success.</b></p>
	<b>Skill</b>	<b>CLO3. Work effectively in group projects in a specific context; combining the techniques to conduct practical cases. Respond to the needs of community and industrial sectors</b>
<b>Attitude</b>	<p><b>CLO4. Able to apply appropriate legal and ethical standards.</b></p> <p><b>Adapt project management practices to meet the needs of stakeholders from multiple sectors of the economy (i.e. consulting, government, arts, media, and charity organizations); Identify and follow strictly ethical disciplines in project management</b></p>	

<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td><b>Lecture 1: Introduction to Project Management</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 2: Project management processes for a project</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 3: Work breakdown structure</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 4: Project scheduling</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 5: Resource allocation</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 6: Logical Framework</b></td> <td>2</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 7: Project cost management</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 8: Project risk management</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 9: Project quality management</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 10: Project human resource management</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 11: Project procurement management</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 12: Project executing, monitoring &amp; control.</b></td> <td>1</td> <td>I, T</td> </tr> <tr> <td><b>Lecture 13: Project closing</b></td> <td>1</td> <td>I, T</td> </tr> </tbody> </table>	Topic	Weight	Level	<b>Lecture 1: Introduction to Project Management</b>	1	I, T	<b>Lecture 2: Project management processes for a project</b>	1	I, T	<b>Lecture 3: Work breakdown structure</b>	1	I, T	<b>Lecture 4: Project scheduling</b>	1	I, T	<b>Lecture 5: Resource allocation</b>	1	I, T	<b>Lecture 6: Logical Framework</b>	2	I, T	<b>Lecture 7: Project cost management</b>	1	I, T	<b>Lecture 8: Project risk management</b>	1	I, T	<b>Lecture 9: Project quality management</b>	1	I, T	<b>Lecture 10: Project human resource management</b>	1	I, T	<b>Lecture 11: Project procurement management</b>	1	I, T	<b>Lecture 12: Project executing, monitoring &amp; control.</b>	1	I, T	<b>Lecture 13: Project closing</b>	1	I, T
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<b>Lecture 13: Project closing</b>	1	I, T																																									
<b>Examination forms</b>	Short-answer questions, exercises																																										
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																										
<b>Reading list</b>	<p>[1] Book name: A Guide to the project management body of knowledge (PMBOK® Guide). 5<sup>th</sup> Edition, Newtown Square, Pa. : Project Management Institute, Inc.</p> <p>[2] Project management: A managerial approach / Jack R. Meredith, Samuel J. Mantel. 7<sup>th</sup> Edition, Hoboken, N.J. : Wiley ; Chichester : John Wiley [distributor], 2009.</p> <p>[3] The project management life cycle/ Jason West land. Kogan Page Limited, 2006</p>																																										

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

ILO							
CLO	1	2	3	4	5	6	7
1		x					
2		x					
3						x	
4				x			

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

ASIIN learning outcomes									
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4	1.1b		1.3c					2.5b	2.6b

### **3. Planned learning activities and teaching methods**

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to Project Management, project life cycle and organization	1 1.2.b		Lecture, Group work	[1].
2	Lecture 2: Project management processes for a project <ul style="list-style-type: none"> <li>- Common project management process interactions.</li> <li>- Project management process groups.</li> <li>- Initiating process group</li> </ul>	1 1.2.b	HW 1	Lecture, Group work	[1].

	- Planning process group				
3	Lecture 3: Work breakdown structure	1,3,4 1.2.b 1.2.a/1.3. d	HW 2	Lecture, Group work	[1].
4	Lecture 4: Project scheduling. - Constructing the network: AON & AOA - Gantt chart - Solving the network - Using Microsoft Project software	1,3,4 1.2.b 1.2.a/1.3. d	HW 3	Lecture, Group work	[1].
5	Lecture 5: Resource allocation - Critical path method – Crashing a project - Resource allocation problem - Resource loading - Resource leveling - Constrained resource scheduling	1,3,4 1.2.b 1.2.a/1.3. d 1.1.b	HW 4	Lecture, Group work	[1].
6 & 7	Lecture 6: Logical Framework Approach (LFA)	3 1.2.a/1.3. d		Lecture, Group work	[1].
8	Review for Midterm				
	Midterm				
9	Lecture 7: Project cost management Project budgeting & Cost estimation - Top-Down budgeting - Bottom-Up budgeting - Improving the process of cost estimation	2, 3, 4 2.5a 1.2.a/1.3. d 1.1.b	HW 5	Lecture, Group work	[1].
10	Lecture 8: Risk management. - Risk management planning - Risk identification - Risk analysis - Risk monitoring and control - Using Crystal Ball software	2, 3, 4 2.5a 1.2.a/1.3. d 1.1.b	HW 6	Lecture, Group work	
11	Lecture 9: Project quality management - Plan quality - Perform quality assurance - Perform quality control	2, 3, 4 2.5a 1.2.a/1.3. d 1.1.b	HW 7	Lecture, Group work	[1].
12	Lecture 10: Project human resource management - Develop human resource plan - Acquire project team - Develop project team - Manage project team	2, 3, 4 2.5a 1.2.a/1.3. d 1.1.b	HW 8	Lecture, Group work	[1].
13	Lecture 11: Project procurement management - Plan procurements - Conduct procurements - Administer procurements	2, 3, 4 2.5a 1.2.a/1.3. d	HW 9	Lecture, Group work	[1].



	- Close procurements	1.1.b			
14	Lecture 12: Project executing, monitoring & control.	2, 3, 4 2.5a	HW 10	Lecture, Group work	[1].
15	Lecture 13: Project closing Project Presentation Review for Final Exam	2, 3, 4 2.5a 1.2.a/1.3. d 1.1.b		Problems solving Group work	[1].
	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Homework exercises (30%)	HW1-2 50% Passes	HW4, HW5, HW6 50% Passes	HW7-8 50% Pass	HW9-10 50% Pass
Midterm exam (30%)	Q1 50% Passes	Q2 50% Passes	Q3, Q4 50% Pass	
Final exam (40%)	Q1 50% Passes	Q2 50% Passes	Q3, Q4 50% Pass	

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		
<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		
<b>Analysis and discussion demonstrate good subject mastery</b>	<b>30</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		
<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		

<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: Aug 23, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

## SYLLABUS

### Forecasting techniques (ISE104IU)

#### 1. General Information

- Course Title:	
+ Vietnamese: Kỹ thuật dự báo	
+ English: Forecasting techniques	
- Course ID: ISE104IU	
- Belongs to the curriculum/skill of the undergraduate program:	- Belongs to the curriculum/skill of the master program:
<input type="checkbox"/> Basic knowledge	<input type="checkbox"/> General knowledge
<input type="checkbox"/> Major knowledge	<input checked="" type="checkbox"/> Basic knowledge of major
<input type="checkbox"/> Course in general skills	<input type="checkbox"/> Other knowledge
<input type="checkbox"/> Basic knowledge of major	<input type="checkbox"/> Master thesis
<input type="checkbox"/> Other knowledge	
<input type="checkbox"/> Undergraduate thesis	
- Number of credits:	
+ Lecture: 2	
+ Laboratory: 0	
- Prerequisites:	
+ Engineering Probability & Statistics	
+ Production & Operations Management	
- Concurrent Courses: None	

#### 2. Course Description

It provides an overview of fundamental concepts:

- i. The formulation and specification of forecasting models;
- ii. data collection, interpretation, organization, and analysis for building forecasting models;
- iii. fundamental statistical and probability concepts used in forecasting;
- iv. the existence of a hierarchy of forecasting models;
- v. the use of econometric software in a lab setting.

#### 3. Textbooks and Other Required Materials

##### Textbooks:

1. Business Forecasting, John Hanke, Dean Wichern, 9th Edition

2. Montgomery et al., *Introduction to Time Series and Forecasting*,  
 Publisher: J. Wiley & Sons, 2008

**Reference materials:** None

**Software:** None

#### 4. Course content

No.	Topics	Time Allocation		Resources
		Theory (45 Periods)	Practice (0 Periods)	
1	Introduction to Forecasting	3	0	[1]
2	Review of Basic Statistical Concepts	3	0	[1]
3	Data Patterns and Forecasting Techniques	6	0	[1]
4	Moving Averages and Smoothing Methods	6	0	[1]
5	Time-Series and Their Components	3	0	[1]
6	Simple Linear Regression	3	0	[1]
7	Multiple Regression Analysis	3	0	[1]
8	Forecasting Models	6	0	[1]
9	Box-Jenkins (ARIMA)	6	0	[1]
10	Judgemental Forecasting and Forecasting Adjustments	3	0	[1]
11	Managing the Forecasting Process	3	0	[1]

#### 5. Course Goals

Goal (Gx) (1)	Goal's description (2)	Learning outcome of curriculum (3)	Qualification capacity (4)
G1	Able to manipulate features of a computer package	1, 4	Apply
G2	Able to evaluate forecast error measures	1, 4	Analyze
G3	Able to identify and discuss features of appropriate forecasting models	4,5	Analyze
G4	Able to manipulate the mathematical and statistical properties of classes of forecasting models.	3, 4, 5	Apply

## 6. Learning Outcome

<b>Learning outcome (Gx.x) (1)</b>	<b>Learning outcome's description (2)</b>	<b>Teaching level (I, T, U) (3)</b>
G1.1	Able to use a computer package for developing forecasting models	T
G1.2	Able to apply the techniques learned in the course to lab assignments	U
G2.1	Able to communicate the importance and use of economic forecasting to reduce uncertainty	T
G2.2	Able to interpret forecasting error metrics	T
G3.1	Able to differentiate economic forecasting methods and models	T
G3.2	Able to adapt appropriate forecasting methods and models to different sectors	U

*I (Introduce); T (Teach); U (Utilize)*

## 7. Course Assessment

<b>Assessment component (1)</b>	<b>Assessment form (A.x.x) (2)</b>	<b>Percentage % (3)</b>
A1. Process assessment	A1.1. Quiz	10%
	A1.2. Homework	10%
A2. Midterm assessment	A2.1. Mid-term Exam	30%
A3. Final assessment	A3.1. Full Semester Project	10%
	A3.2. Final exam	40%

## 8. Detailed Teaching Plan

<b>Week/ Class</b>	<b>Content</b>	<b>Learning outcomes of course</b>	<b>Teaching and learning activities</b>	<b>Assessment</b>
1	Introduction to Forecasting	G2.1	Lecture, Class discussion	A1.1
2 & 3	Data Patterns and Forecasting Techniques	G2.2, G3.1, G3.2,	Lecture, Class discussion	A1.1, A1.2, A2.1
4&5	Moving Averages and Smoothing Methods	G1.1, G1.2, G2.2	Lecture, Class discussion	A1.2, A2.1
<b>Midterm Exam</b>				

6&7	Time-Series and Their Components	G1.1, G1.2, G2.2, G3.2,	Lecture, Class discussion	A1.2, A2.1
8&9&10	Box-Jenkins (ARIMA) Type	G1.1, G1.2, G2.2, G3.2	Lecture, Class discussion	A1.2, A3.1, A3.2
<b>Final Exam</b>				

## 9. Course Policy

**Class Participation:** A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

**Academic Honesty and Plagiarism:** Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

## 10. Lecturer

- School/Department:  
School of Industrial Engineering and Management, Room: A2-602  
Department of Industrial Systems and Engineering
- Lecturer: Dr. Ha Thi Xuan Chi
- Email: htxchi@hcmiu.edu.vn

*Ho Chi Minh City, 10/08/2023*  
**DEAN OF SCHOOL**  
*(sign, write your full name)*

*Assoc. Prof. Dr. Nguyen Van Hop*





**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
Department/School of IEM

**COURSE SYLLABUS**

**Course Name: Data Collection and Analysis**

Course Code: IŞ092IU

**1. General information**

Course designation	
Semester(s) in which the course is taught	
Person responsible for the course	<i>Please indicate a specific person.</i>
Language	
Relation to curriculum	<i>Compulsory / elective / specialisation Names of other study programmes with which the module is shared</i>
Teaching methods	<i>lecture, lesson, project</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 Private study including examination preparation, specified in hours<sup>1</sup>: 30</i>
Credit points	3
Required and recommended prerequisites for joining the course	

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	This is a class about data: how to collect, organize, analyse, and visualize data in an accurate and compelling manner for your audience. Data collection, data analysis, and data visualization are all a) interconnected and thus b) equally important. In other words: you will learn and practice how to handle data professionally and responsibly. These are the skills, tools, and concepts that you need to be successful in your future regardless of your major today.	
Course learning outcomes	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	Knowledge	CLO1: Identify, explain, and demonstrate the steps, tools, and skills involved in real-world data collection, data analysis, and data visualization efforts.
	Skill	CLO2: Effectively select appropriate modes and tools of inquiry, analysis, interpretation, evaluation, and communication in the context of data collection, data analysis, and data visualization.
Attitude	CLO3: Evaluate the ethical issues and biases surrounding data collection, data analysis, and data visualization. Understand the role of data (and its appropriate use) to answer relevant societal questions at a variety of scales across space and time.	

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight (hour)</b>	<b>Level</b>
	Introduction and course overview	3	I, T
	Research questions and why they matter for data collection	3	I, T
	Questionnaires – When to use them and how	3	I, T
	Purposeful sampling of study participants	3	I, T
	Recruitment of study participants	3	I, T
	Data collection through field work and participant observation	3	T, U
	Semi-structured/focus group interviews	3	T, U
Coding & reporting findings from qualitative data	3	T, U	
Pros and cons of common data collection strategies	3	T, U	
Examination forms	Project and Writing examination		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	<i>Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. Thousand Oaks, California: Sage.</i> <i>Maxwell, J. A. (2013). Qualitative research design: An interactive approach. Thousand Oaks, California: Sage.</i> <i>Adams, A. and Cox, A. L. (2008). Research methods for human computer interaction. Cambridge, UK: Cambridge University Press.</i>		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-...) and Program/Student Learning Outcomes (SLO) (1 -...) is shown in the following table:

	SLO
--	-----

CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction and course overview	1			
2	Research questions and why they matter for data collection	1			
3	Statistics review part 1	1			
4	Statistics review part 2	1			
5	Questionnaires – When to use them and how	2			
6	Purposeful sampling of study participants	2			
7	Recruitment of study participants	2			
8	Data collection through field work and participant observation	2			
9	Midterm exam				
10	Semi-structured/focus group interviews	2			
11	Coding & reporting findings from qualitative data	2			
12	Pros and cons of common data collection strategies	3			
13	Tools for data analysis part 1	3			
14	Tools for data analysis part 2	3			
16	Project presentation	3			
17	Final exam				

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	... 60% Pass	... 60% Pass	... ...% Pass
Project (20%)	... 50% Pass	... 50% Pass	... 50% Pass
Midterm (30%)	... 50% Pass	... 50% Pass	
Final (40%)	... 50% Pass	... 50% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....	HW/Assignment: .....		
Date: .....	Evaluator: .....		
	Max.	Score	Comments
<b>Part 1..... (...%)</b>			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
<b>Part 2..... (...%)</b>			
Criterion 1 ...:			
Criterion ...:			
<b>Part 3..... (...%)</b>			
Criterion 1...:			
Criterion ...:			
<b>Part ..... (...%)</b>			
<b>TOTAL SCORE</b>	100		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1

<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone		Milestone		Benchmark
	4	3	2	1	
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.	

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

Ho Chi Minh City, dd/mm/yyyy

**Head/Dean of Department/School**

(Signature)



<Full Name>

Assoc. Prof. Dr. Nguyen Van Hop

**COURSE SYLLABUS****Course Name: Probabilistic Models in Operation Research**Course Code: **IS024IU****1. General information**

<b>Course designation</b>	
<b>Semester(s) in which the course is taught</b>	1
<b>Person responsible for the course</b>	<i>Dr. Phan Nguyen Ky Phuc</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	<i>Compulsory</i>
<b>Teaching methods</b>	<i>Lecture, lesson, project</i>
<b>Workload (incl. contact hours, self-study hours)</b>	<i>(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours<sup>1</sup>:</i>
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.



<b>Course objectives</b>	This course is to introduce the fundamental probabilistic models in operation research field. The course shows how a probabilistic system can be analyzed and come up with formulas. Topics to be covered include: random variable, discrete distribution, continuous distribution, joint distribution, expectation, Markov Chain, Poisson Process, queueing model, and reliability.																																
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th>Competency level</th> <th colspan="2">Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td colspan="2"> <p>CLO1. Students are able to master the basic knowledge of modeling and calculating joint distributions of discrete and continuous system.</p> <p>CLO2. Students are able to master the basic knowledge of building the Markov Chain, find state space, and stability of the system</p> <p>CLO3. Students are able to master the basic knowledge of building the Markov Chain for the poison process, queueing models</p> </td> </tr> <tr> <td><b>Skill</b></td> <td colspan="2">CLO4. Students are able to apply their knowledge and develop practical skills for solving problems, conducting experiments and developing equipment and processes of engineering by using MATLAB software</td> </tr> </tbody> </table>			Competency level	Course learning outcome (CLO)		<b>Knowledge</b>	<p>CLO1. Students are able to master the basic knowledge of modeling and calculating joint distributions of discrete and continuous system.</p> <p>CLO2. Students are able to master the basic knowledge of building the Markov Chain, find state space, and stability of the system</p> <p>CLO3. Students are able to master the basic knowledge of building the Markov Chain for the poison process, queueing models</p>		<b>Skill</b>	CLO4. Students are able to apply their knowledge and develop practical skills for solving problems, conducting experiments and developing equipment and processes of engineering by using MATLAB software																						
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<b>Examination forms</b>	Written Exam
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	<b>Textbooks:</b> [1] Sheldon M. Ross, Introduction to Probability Models, 2014, 11th edition.  <b>References:</b> 1. A first course of Probability, 4 <sup>th</sup> ed, Sheldon M. Ross, Prentice Hall

## 2. Learning Outcomes Matrix (optional)


The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	X						
2	X						
3	X						
4						X	

### Intended Learning Outcomes

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
- an ability to communicate effectively with a range of audiences*
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*

6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
4		1.2a	1.3d		2.2b		2.4b	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessment s	Learning activities	Resources
1 & 2	Introduction to discrete random variables	1		Lecture	
3 & 4	Most common discrete distribution and their applications	1	HW1	Lecture Think pair-share HW	
5&6	Joint distribution for discrete variable	1	Quiz1	Lecture Quiz	
7&8	Markov Chain	2	HW2	Lecture HW	
9	<b>Midterm</b>				
10 & 11	<b>Exponential Distribution</b>	3	HW3	Lab	
12	<b>Poisson Process</b>	3	Quiz2	Lecture Quiz	
13 & 14	<b>Queuing models: M/M/K, shoes side shop</b>	3	HW4	Lecture HW	
15	<b>Reliability</b>	2	Quiz3	Lecture HW Group Project	
16	<b>MATLAB</b>	4		- Lecture Quiz	
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes (10%)	Qz1 60% Passes		Qz3 60% Passes	... ...% Pass
Howework exercises (20%)	HW1 50% Passes	HW2 50% Passes	HW3 50% Passes	HW4 50% Pass
Midterm (30%)		60% Passes		
Final (40%)			60% Passes	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Part 1.... (...%)</b>			
<b>Criterion 1:</b>			
<b>Criterion 2:</b>			
<b>Criterion 3:</b>			
<b>Criterion ...:</b>			
<b>Part 2.... (...%)</b>			
<b>Criterion 1 ...:</b>			
<b>Criterion ...:</b>			
<b>Part 3.... (...%)</b>			
<b>Criterion 1...:</b>			
<b>Criterion ...:</b>			
<b>Part .... (...%)</b>			
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: Experimental Design**Course Code: **IS031IU****1. General information**

<b>Course designation</b>	Statistical design of experiments refers to the process of planning the experiment so that appropriate data will be collected and analyzed by statistical methods, resulting in valid and objective conclusions. A well designed experiment not only reveals important information of a process or system, but is also cost efficient. This applied statistic course benefits tremendously for both engineers and researchers in many activities such as new product design, manufacturing process development and process improvement. Coverage includes factorial, fractional factorial experimental designs, blocking and confounding factors, regression modeling and response surface methodology.
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Dr. Pham Huynh Tram
<b>Language</b>	English
<b>Relation to curriculum</b>	Elective
<b>Teaching methods</b>	Lecture, project



<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (lecture):45 Private study including examination preparation, specified in hours <sup>1</sup> : 25	
<b>Credit points</b>	3	
<b>Required and recommended prerequisites for joining the course</b>	Engineering Probability and Statistics	
<b>Course objectives</b>	Students are able to design experiments to test a hypothesis, analyze and interpret data	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO1. Understand basic concepts of experimentation</b>
	<b>Knowledge</b>	<b>CLO2. Understand different types of experimental designs and their usages</b>
	<b>Skill</b>	<b>CLO3. Able to plan different types of experimental designs</b>
<b>Knowledge</b>	<b>CLO4. Able to apply knowledge of statistics to analyse experimental results</b>	

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<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	<b>Introduction to Design of Experiments</b> <i>Strategy, applications, guidelines and basic principles</i>	<b>1</b>	<b>I</b>
	<b>Review of Basic Statistical Methods</b> <i>Sampling</i> <i>Inferences about the differences in means</i> <i>Inferences about the variances of normal distribution</i>	<b>1</b>	<b>I</b>
	<b>Analysis of Variance</b> <i>Single-factor analysis of variance</i> <i>Model adequacy checking</i> <i>Interpreting of the results</i> <i>Sample computer output</i> <i>Determining sample size</i> <i>Dispersion effects</i> <i>Regression approach</i> <i>Real economy application of a designed experiment</i>	<b>1</b>	<b>I</b>
	<b>Experiments with Blocking Factors</b> <i>Randomized block</i> <i>Latin square design</i> <i>Incomplete block designs</i>	<b>2</b>	<b>T,U</b>
	<b>Factorial Experiments</b> <i>Basic definitions and principles</i> <i>Two factors factorial design</i> <i>Blocking in factorial experiments</i>	<b>1</b>	<b>T, U</b>
<b>Two-level Factorial Designs</b> <i>The 2<sup>2</sup> design, the 2<sup>3</sup> design</i> <i>The general 2<sup>k</sup> design</i> <i>Single replicate of the 2<sup>k</sup> design</i>	<b>1</b>	<b>T,U</b>	
<b>Factorial Experiments</b> <i>Basic definitions and principles</i> <i>Two factors factorial design</i> <i>Blocking in factorial experiments</i>	<b>1</b>	<b>T, U</b>	

	<p><b>Two-level Factorial Designs</b>  <i>The 2<sup>2</sup> design, the 2<sup>3</sup> design</i>  <i>The general 2<sup>k</sup> design</i>  <i>Single replicate of the 2<sup>k</sup> design</i></p>	2	T, U
	<p><b>Two-level Fractional Factorial Designs</b>  <i>One-half fraction of the 2<sup>k</sup> design</i>  <i>One quarter fraction of the 2<sup>k</sup> design</i>  <i>Blocking fractional factorials</i></p>	2	T,U
	<p><b>Regression Modeling</b>  <i>Linear regression models</i>                      <i>Estimation of the parameters</i>  <i>Hypothesis testing of the parameters</i></p>	1	I
	<p><b>Response Surface Methodology</b>  <i>Method of steepest ascent</i>  <i>Analysis of a second-order response surface</i>  <i>Application to robust design</i></p>	2	I
<b>Examination forms</b>	Writing, project presentation		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.  Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
<b>Reading list</b>	[1] D.C. Montgomery, Design and Analysis of Experiments, 7th ed., Wiley, 2009.		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	SLO						
	1	2	3	4	5	6	7
1						x	
2						x	
3						x	
4						x	

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*

2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a	1.3d		2.2b		2.4b	2.5a	
2		1.2a	1.3d		2.2b		2.4b	2.5a	
3		1.2a	1.3d		2.2b		2.4b	2.5a	
4		1.2a	1.3d		2.2b		2.4b	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLOs	Assessment Activities	Resources
1	Introduction to Design of Experiments <i>Strategy, applications, guidelines and basic principles</i>	1	HW Midterm	[1].1
2	Review of Basic Statistical Methods <i>Sampling</i> <i>Inferences about the differences in means</i> <i>Inferences about the variances of normal distribution</i>	4	HW Midterm	[1].2
3	Analysis of Variance <i>Single-factor analysis of variance</i> <i>Model</i> <i>adequacy checking</i> <i>Interpreting of the results</i>  <i>Sample computer output</i> <i>Determining sample size</i> <i>Dispersion</i> <i>effects</i> <i>Regression approach</i> <i>Real economy application of a designed experiment</i>	4	HW Midterm	[1].3
4 &5	Experiments with Blocking Factors <i>Randomized block</i> <i>Latin square design</i> <i>Incomplete block designs</i>	2 3 4	HW Midterm	[1].4

<b>6</b>	Factorial Experiments <i>Basic definitions and principles</i> <i>Two factors factorial design</i> <i>Blocking in factorial experiments</i>	2 3 4	HW Midterm	[1].5
<b>7</b>	Two-level Factorial Designs <i>The 2<sup>2</sup> design, the 2<sup>3</sup> design</i> <i>The general 2<sup>k</sup> design</i> <i>Single replicate of the 2<sup>k</sup> design</i>	2 3 4	HW Midterm	[1].6
<b>MIDTERM EXAMINATION</b>				
<b>8</b>	Two-level Factorial Designs (cont) <i>Addition of center points to the 2<sup>k</sup>-design</i> <i>Blocking a replicated 2<sup>k</sup> design</i> <i>Confounding in the 2<sup>k</sup> design</i>		HW Final	[1].7
<b>9&amp;10</b>	Two-level Fractional Factorial Designs <i>One-half fraction of the 2<sup>k</sup> design</i> <i>One quarter fraction of the 2<sup>k</sup> design</i> <i>Blocking fractional factorials</i>	2 3 4	HW Final	[1].8
<b>11</b>	Regression Modeling <i>Linear regression models</i> <i>Estimation</i> <i>of the parameters</i> <i>Hypothesis testing of the</i> <i>parameters</i>	2 3 4	HW Final	[1].10
<b>12&amp;13</b>	Response Surface Methodology <i>Method of steepest ascent</i> <i>Analysis of a second-order response surface</i> <i>Application to robust design</i>	2 3 4	HW Final	[1].11
<b>14</b>	Group presentation			
<b>15</b>	Review for final			
<b>FINAL EXAMINATION</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Project (20%)	X	X	X	X
Homework (10%)	X	X		X
Midterm exam (30%)	X	X		X
Final exam (40%)	X	X		X

Note: %Pass: Target 70% of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>			
<b>TOTAL SCORE</b>			
	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: April 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*





**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
**School of Industrial Engineering and Management**

**COURSE SYLLABUS**

**Course Name: MULTI-CRITERIA DECISION MAKING**

Course Code: **IS033IU**

**1. General information**

<b>Course designation</b>	This course provides basic concepts, tools and techniques of decision making for solving complex problems in production, services, and daily life. This course includes two parts: multi-attribute decision making (MADM) and multi-objective decision making (MODM).
<b>Semester(s) in which the course is taught</b>	1
<b>Person responsible for the course</b>	<i>Dr. Ha Thi Xuan Chi</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	<i>Compulsory</i>
<b>Teaching methods</b>	<i>Lecture, lesson, project</i>
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Decision making is one of the important parts in operations research or management science. Decision making techniques help managers choose the best alternative based on quantitative and qualitative criteria or find the optimal solutions under many conflicts of objectives. Output analysis is also considered to draw inference of the actual problems. This course provides basic concepts, tools and techniques of decision making for solving complex problems in production, services, and daily life. This course includes two parts: multi-attribute decision making (MADM) and multi-objective decision making (MODM).	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO1. Able to build the procedure for decision making</b> <b>CLO2. Able to recognize MADM and MODM techniques</b> <b>CLO3. Able to model problems by using MADM techniques</b> <b>CLO4. Able to apply knowledge of deterministic models in operation research to formulate MODM models</b> <b>CLO5. Able to solve MODM problems by using MODM techniques</b> <b>CLO6. Able to read and interpret the solutions</b> <b>CLO7. Able to redesign the models to meet the requirements</b>
	<b>Skill</b>	<b>CLO8. Able to use Expert Choice software as a tool to solve AHP technique</b>
	<b>Attitude</b>	

<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Introduction to MCDM</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Introduction to Multi-Attribute Decision Making Techniques: Simple Addictive Weight Technique, TOPSIS</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Analytic Hierarchy Process</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Introduce to Expert choice software to solve Analytic Hierarchy Process problems</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Fuzzy AHP</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Introduction to Multi-Objective Decision Making</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Minimum Deviation and Compromise Programming</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Goal Programming</td> <td>0.5</td> <td>T, U</td> </tr> <tr> <td>De Novo Technique</td> <td>0.5</td> <td>T, U</td> </tr> </tbody> </table>	Topic	Weight	Level	Introduction to MCDM	1	I, T	Introduction to Multi-Attribute Decision Making Techniques: Simple Addictive Weight Technique, TOPSIS	2	T, U	Analytic Hierarchy Process	1	T, U	Introduce to Expert choice software to solve Analytic Hierarchy Process problems	2	T, U	Fuzzy AHP	2	T, U	Introduction to Multi-Objective Decision Making	2	I, T	Minimum Deviation and Compromise Programming	1	T, U	Goal Programming	0.5	T, U	De Novo Technique	0.5	T, U
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<b>Examination forms</b>	Written Exam																														
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																														
<b>Reading list</b>	<p><b>Textbooks:</b>  [1] <i>“Multiple Attribute Decision Making: Methods and applications”</i>. Gwo-Hshiung Tzeng &amp; Jih-Jeng Huang, CRC Press, Taylor &amp; Francis Group, 2011 by Taylor &amp; Francis Group.</p> <p><b>References:</b>  [2] Milan Zeleny, <i>Multiple Criteria Decision Making</i>, McGraw-Hill, 1982.</p> <p><b>Software:</b>  Expert choice</p>																														

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-...) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2	x						
3	x	x					
4	x	x					
5	x	x					
6	x	x					
7						x	
8						x	

### Intended Learning Outcomes

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
3		1.2a 1.2b	1.3d 1.3c	2.1a, 2.1b	2.2a		2.4a	2.5a	
4		1.2a 1.2b	1.3d 1.3c	2.1a, 2.1b	2.2a		2.4a	2.5a	
5		1.2a 1.2b	1.3c 1.3d	2.1a 2.1b	2.2a		2.4a	2.5a	
6		1.2a 1.2b	1.3c 1.3d	2.1a 2.1b	2.2a		2.4a	2.5a	

7		1.2a	1.3d		2.2b		2.4b	2.5a	
8		1.2a	1.3d		2.2b		2.4b	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to MCDM	1, 2		Lecture	
2	Introduction to Multi-Attribute Decision Making Techniques: Simple Addictive Weight Technique, TOPSIS	2, 6, 7	HW1	Lecture Think pair-share HW	
3	Analytic Hierarchy Process	3, 6, 7	HW2	Lecture Think pair-share HW	
4&5	Introduce to Expert choice software to solve Analytic Hierarchy Process problems	3, 6, 7	HW3, Exam	Lecture Think pair-share HW	
6	Fuzzy AHP	2, 6, 7	HW4, Exam	Lecture, Class discussion and practice	
7	ELECTRE technique	2, 6, 7	HW5, Exam	Lecture, Class discussion and practice	
8	Review	2, 3, 6, 7	HW6, Exam	Lecture, Class discussion and practice	
9	Midterm exam				
10	Introduction to Multi-Objective Decision Making	4	Quiz 1	Lecture, Class discussion, Quiz	
11	Minimum Deviation and Compromise Programming	4, 5, 6, 7	Semester Project	Lecture, Class discussion, Group Project	
12	Goal Programming	4, 5, 6, 7	HW7, Exam	Lecture, Class discussion HW	
13	De Novo Technique	4, 5, 6, 7	HW8, Exam	Lecture, Class discussion, HW	
14	Review			Lecture	
15	Final exam				

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7	CLO8
Homework exercise /quizzes (15%)	... ...%P ass	HW1 60%%P ass	HW2 60%P ass	Quiz 1 60%Pas s	HW7, HW8	HW1 60%% Pass	HW1 60%% Pass	

		HW4, HW5 60% Pass	HW3, HW6 60% Pass	HW7, HW8 60%Pas s	60%P ass	HW2, HW3, HW4, HW5 60% Pass HW7, HW8 60%P ass	HW2, HW3, HW4, HW5 60% Pass HW7, HW8 60%P ass	
Group Project (15%)	60%P ass	60%Pas s		Group Project 60%Pas s	Group Projec t 60%P ass	Group Projec t 60%P ass	Group Projec t 60%P ass	
Midterm (30%)	60%P ass	60%Pas s	60%P ass	60%Pas s				
Final (40%)	60%P ass	60%Pas s	60%P ass	60%Pas s				

Note: %Pass: Target that 60% of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (80%)</b>			
<b>Problem Identification: Be able to identify the objective(s), alternative(s) and criteria in the Industrial Engineering and Management field.</b>	<b>20</b>		
<b>Data collection and software usage: Know how to transform the data into the proper form and solve the models using computer-based software such as Expert Choice, Excel,..</b>	<b>20</b>		
<b>Methodology: Know how to apply proper decision-making techniques to solve the problem.</b>	<b>20</b>		
<b>Solution and Implementations: Be able to implement the solution in practices and do the output analysis.</b>	<b>20</b>		
<b>Report writing and Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
<b>5</b>	<b>Demonstrates complete understanding of the problem. All requirements of task are included in response</b>
<b>4</b>	<b>Demonstrates considerable understanding of the problem. All requirements of task are included.</b>
<b>3</b>	<b>Demonstrates partial understanding of the problem. Most requirements of task are included.</b>
<b>2</b>	<b>Demonstrates little understanding of the problem. Many requirements of task are missing.</b>
<b>1</b>	<b>Demonstrates no understanding of the problem.</b>
<b>0</b>	<b>No response/task not attempted</b>

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

**6. Date revised:**



*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*



**COURSE SYLLABUS**  
**Course Name: Facility Layout**  
Course Code: **IS032IU**

**1. General information**

<b>Course designation</b>	This course focuses on the fundamentals of the design, layout, and location of industrial and non manufacturing facilities. Selection of machines and material handling equipment and their efficient arrangement. Emphasis on quantitative methods. Warehouse layout. Facility location theory
<b>Semester(s) in which the course is taught</b>	5
<b>Person responsible for the course</b>	Dr. Dao Vu Truong Son
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, Exercises, Assignment
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	Nil

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Understand the fundamentals of the design, layout, and location of industrial and nonmanufacturing facilities. Selection of machines and material handling equipment and their efficient arrangement. Emphasis on quantitative methods. Warehouse layout. Facility location theory																													
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:																													
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																												
	<b>Knowledge</b>	<b>CLO1. Understand the fundamental and advanced concepts in the design, layout, and location of industrial and nonmanufacturing facilities.</b> <b>CLO2. Know how to select machines and material handling equipment and their efficient arrangement.</b>																												
	<b>Skill</b>	<b>CLO3. Use Excel to solve facility location problems</b>																												
<b>Attitude</b>	<b>CLO4. Students will have positive attitude in both self-learning and group project with other disciplines related to port planning and design, especially solving related problems.</b>																													
<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td><b>Introduction to Facilities Planning.</b></td> <td><b>3</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Product and Process Design</b></td> <td><b>6</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Flow systems, activity relationships, and space requirement</b></td> <td><b>6</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Plant Layout, Inspection Systems in Design</b></td> <td><b>6</b></td> <td><b>T, U</b></td> </tr> <tr> <td><b>Manufacturing &amp; warehouse operations and material handling systems</b></td> <td><b>6</b></td> <td><b>T, U</b></td> </tr> <tr> <td><b>Single &amp; Multi-Facility Location models</b></td> <td><b>3</b></td> <td><b>T, U</b></td> </tr> <tr> <td><b>Machine Layout Models</b></td> <td><b>3</b></td> <td><b>T, U</b></td> </tr> <tr> <td><b>Warehouse and Order Picking Systems</b></td> <td><b>3</b></td> <td><b>T, U</b></td> </tr> </tbody> </table>			Topic	Weight	Level	<b>Introduction to Facilities Planning.</b>	<b>3</b>	<b>I, T</b>	<b>Product and Process Design</b>	<b>6</b>	<b>I, T</b>	<b>Flow systems, activity relationships, and space requirement</b>	<b>6</b>	<b>I, T</b>	<b>Plant Layout, Inspection Systems in Design</b>	<b>6</b>	<b>T, U</b>	<b>Manufacturing &amp; warehouse operations and material handling systems</b>	<b>6</b>	<b>T, U</b>	<b>Single &amp; Multi-Facility Location models</b>	<b>3</b>	<b>T, U</b>	<b>Machine Layout Models</b>	<b>3</b>	<b>T, U</b>	<b>Warehouse and Order Picking Systems</b>	<b>3</b>	<b>T, U</b>
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<b>Examination forms</b>	Practice, Writing questions																													
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																													

<b>Reading list</b>	<p>[1] Tompkins, J.A., White, J.A., et al., (2002), Facilities Planning, 3rd Edition, John Wiley and Sons.</p> <p>[2] R.L., Francis, L. F., McGinnis, J.A., White, (1992), Facility Layout and Location: an Analytical Approach, 2nd edition, Prentice-Hall, Inc., Englewood Cliffs, N.J.</p>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-6) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2		x					
3			x	x			
4					x	x	

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3	1.1b 1.1c		1.3a 1.3c					2.5b	2.6a 2.6b
4	1.1c	1.2a	1.3b 1.3d		2.2b		2.4b	2.a	2.6a

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Facilities Planning.	1		Lecture, Discussion,	[1].1 [2]
2,3	Product and Process Design.	1, 2	Exercises	Lecture, Discussion	[1].2-3
4, 5	Flow systems, activity relationships, and space requirement	2,3	Exercises	Lecture, Discussion, HW Inclass-Quiz	[1] 4,5 [2]
6, 7	Plant Layout, Inspection Systems in Design	2,3	Exercises	Lecture, Discussion, HW Inclass-Quiz	[1]. 2,3, 6, 7, 9 [2]. 2
8	Review	2	Exercises		
9	Midterm				
10,11	Manufacturing & warehouse operations and material handling systems	4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1]. 9
12	Single & Multi-Facility Location models	3, 4	Exercises, HW, Quiz	Lecture, Discussion, Inclass-Quiz	[1]. 10
13	Machine Layout Models	3, 4	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 22 [2]. 8
14	Warehouse and Order Picking Systems	3	Exercises	Lecture,	[1] 21 [2] 9
15	Project Presentation	3,4			
16	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class assignment (10%)	HW 1 60% Pass	HW2 60% Pass	HW3-HW4 60% Pass	
Group projects (20%)				Group project 80% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (65%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (5%)</b>			
	05		
<b>TOTAL SCORE</b>			
	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1

<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### ***Oral communication value rubric for evaluating presentation tasks:***

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.

<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: April 15, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**

*(Signature)*

*Assoc. Prof. Dr. Nguyen Van Hop*





## COURSE SYLLABUS

**Course Name: Advanced Industrial Big Data Analytics**

Course Code: **IS096IU**

### 1. General information

Course designation	This course will provide an in-depth and real-world comprehension of advanced healthcare data analytics topics and the intersecting fields of data mining. The course consists of hands-on projects through the understanding of data visualization, implementing scientific decision making and using predictive data analytics. This includes the use of data to make decisions on business goals and objectives as various types of organizations and emerging financial models depend on data analytics.
Semester(s) in which the course is taught	8
Person responsible for the course	
Language	English
Relation to curriculum	
Teaching methods	Lecture, lesson, assignment
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: Contact hours: 45 periods Private study including examination preparation, specified in hours <sup>1</sup> :
Credit points	3

Required and recommended prerequisites for joining the course	Statistics and Probability		
Course objectives	This course is designed to produce engineers specializing in big data; Students will utilize tools and techniques to illustrate and present new knowledge regarding the operations, financial, quality, business intelligence, care and policy in healthcare settings that help to fuel data driven cultures.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	
	<b>Knowledge</b>	<b>CLO1. Develop a concepts of Advanced Industrial Big Data Analytics.</b>	
	<b>Skill</b>	<b>CLO2. Understand and Analyze the use of Prescriptive Modeling</b>	
	<b>Attitude</b>	<b>CLO3. Ability to use the models utilizing techniques of data mining and predictive analytics to produce desired outcomes.</b>	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight (hour)</b>	<b>Level</b>
	<i>The concepts of Advanced Data Analytics.</i>	3	I, T
	<i>The importance and value of data</i>	3	I, T
	<i>Models utilizing techniques of data mining and predictive analytics to produce desired outcomes</i>	3	I, T
	<i>Design visualizations to explain key outcomes</i>	3	T, U
	<i>Model outcomes for quality</i>	3	T, U
	<i>Tools for performing data analytics</i>	3	T, U
	<i>K-Nearest Neighbor Predictive Models, Decision Tree Predictive Models; Random Forests</i>	3	T, U
<i>Linear Regression for continual data modeling</i>	3	T, U	
<i>Analysis by using Prescriptive Modeling</i>	3	T, U	

Examination forms	Writing questions
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] <b>Kumar, Vikar (2018)</b> . Healthcare Analytics Made Simple: Techniques In Healthcare Computing Using Machine Learning and Python. 1st ed. Packt Publishing. ISBN-13: 978-1787286702

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO	SLO					
	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1&2	Machine Learning Foundations - Introduction to Descriptive, Diagnostic, Predictive Analytics and Prescriptive Analytics	1			
3	Introduction to Python	2			
4&5	Python Machine Learning	3			
6&7	Python for predictive analysis using classification	3			
8&9	Python and Decisions Trees	3			
10&11	Random Forests	3			
12&13	Linear Regression Using Python	3			
14&15	Working toward the goal of Prescriptive Analytics	3			

## 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes Homework, (30%)	Qz, HW 60%Pas s	Qz, HW 60%Pas s		Qz, HW 60%Pas s

Midterm exam (30%)	Q1 50% Passes	Q2 50% Passes	Q3, Q4 50% Pass	
Final exam (40%)		Q1 50% Passes	Q 2 50% Pass	Q 3, 4 50% Passes

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (65%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (10%)	10		
<b>TOTAL SCORE</b>	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.

3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone	Benchmark
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	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, 10/08/2023*

*Dean of IEM School*

*(Signature)*

**Assoc. Prof. Dr. Nguyen Van Hop**



VIETNAM NATIONAL UNIVERSITY HCMC  
**INTERNATIONAL UNIVERSITY**  
 Department/School of Industrial Engineering and  
 Management

**COURSE SYLLABUS**

**Course Name: Industrial Intelligent Systems**

Course Code: IS095IU

**1. General information**

Course designation	
Semester(s) in which the course is taught	
Person responsible for the course	<i>Please indicate a specific person.</i>
Language	English
Relation to curriculum	<i>Compulsory / elective / specialisation</i> <i>Names of other study programmes with which the module is shared</i>
Teaching methods	<i>lecture, lesson, project</i>
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (45 lecture + 15 Lab) Private study including examination preparation, specified in hours: 30
Credit points	3
Required and recommended prerequisites for joining the course	Recommended:

Course objectives	<p>This course is designed for introducing the third and fourth grade IE students to the state-of the-art concepts in smart manufacturing systems through hands-on experience in Flexible Automation and Intelligent Manufacturing Laboratory. The course will cover the fundamentals of digital manufacturing technologies, automation and Smart Manufacturing (SM), through topics such as Industry 4.0, subtractive versus additive manufacturing, industrial robotics, manufacturing flexibility, real-time operational control, digital twin and data integration in SM applications. The students will work on Lab assignments and a term project using the available hardware and software in teams of two-three people. Lab assignments will include CAD/CAM integration, 3D printing, robot programming and shop floor control applications. The term project will focus on the modelling and simulation of advanced manufacturing systems.</p>									
Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO1 Ability to design and conduct experiments, as well as to analyze and interpret an intelligent manufacturing system.</td> </tr> <tr> <td>Skill</td> <td>CLO2 Students will apply their knowledge to design solutions to different problems.</td> </tr> <tr> <td>Attitude</td> <td>CLO3 Students will have the ability to design and develop an intelligent manufacturing system for a selected application.</td> </tr> </tbody> </table>		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	Knowledge	CLO1 Ability to design and conduct experiments, as well as to analyze and interpret an intelligent manufacturing system.	Skill	CLO2 Students will apply their knowledge to design solutions to different problems.	Attitude	CLO3 Students will have the ability to design and develop an intelligent manufacturing system for a selected application.
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>									
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Attitude	CLO3 Students will have the ability to design and develop an intelligent manufacturing system for a selected application.									



Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight (hour)</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Overview of historical evolution of manufacturing and automation</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Introduction to 3D Drawing and proper software</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Lab section for 3D drawing</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Introduction to 3D printing</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Lab section for 3D printing</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Introduction to Computer Numerical Control (G Code)</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Lab section for CNC (G Code)</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Midterm</td> <td>3</td> <td></td> </tr> <tr> <td>Reverse engineer (Scan machine)</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Introduction to Robot arm</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Forward and Reverse Kinematic of Robot arm</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Lab section for Robot arm</td> <td>3</td> <td>T,U</td> </tr> <tr> <td>Industrial Data Acquisition and Communication Networks(TCP communication)</td> <td>3</td> <td>T,U</td> </tr> <tr> <td>Iot introduction</td> <td>3</td> <td>T,U</td> </tr> <tr> <td>Final exam</td> <td>3</td> <td></td> </tr> </tbody> </table>	Topic	Weight (hour)	Level	Overview of historical evolution of manufacturing and automation	3	I, T	Introduction to 3D Drawing and proper software	3	I, T	Lab section for 3D drawing	3	I, T	Introduction to 3D printing	3	I, T	Lab section for 3D printing	3	I, T	Introduction to Computer Numerical Control (G Code)	3	T, U	Lab section for CNC (G Code)	3	T, U	Midterm	3		Reverse engineer (Scan machine)	3	T, U	Introduction to Robot arm	3	T, U	Forward and Reverse Kinematic of Robot arm	3	T, U	Lab section for Robot arm	3	T,U	Industrial Data Acquisition and Communication Networks(TCP communication)	3	T,U	Iot introduction	3	T,U	Final exam	3	
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Reading list	<i>Groover, M.P., "Automation, Production Systems, and Computer Integrated Manufacturing", Prentice Hall, 2008.</i> <i>Gibson, Rosen and Stucker, "Additive Manufacturing Technologies", Springer, 2015.</i>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-...) and Program/Student Learning Outcomes (SLO) (1 -...) is shown in the following table:

CLO	SLO					
	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Overview of historical evolution of manufacturing and automation	1			
2	Introduction to 3D Drawing and proper software	1			
3	Lab section for 3D drawing	1			
4	Introduction to 3D printing	1			
5	Lab section for 3D printing	2			
6	Introduction to Computer Numerical Control (G Code)	2			
7	Lab section for CNC (G Code)	2			
8	Midterm	2			
9	Reverse engineer (Scan machine)				
10	Introduction to Robot arm	1			
11	Forward and Reverse Kinematic of Robot arm	1			
12	Lab section for Robot arm	1			
13	Industrial Data Acquisition and Communication Networks(TCP communication)	1			
14	Iot introduction	1			
15	Final exam	1			

## 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	... 60% Pass	... 60% Pass	... ...%Pass
Project (20%)	... 50% Pass	... 50% Pass	... 50% Pass
Midterm (30%)	... 50% Pass	... 50% Pass	
Final (40%)	... 50% Pass	... 50% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....	HW/Assignment: .....		
Date: .....	Evaluator: .....		
	Max.	Score	Comments
<b>Part 1..... (...%)</b>			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
<b>Part 2..... (...%)</b>			
Criterion 1 ...:			
Criterion ...:			
<b>Part 3..... (...%)</b>			
Criterion 1...:			
Criterion ...:			
<b>Part ..... (...%)</b>			
<b>TOTAL SCORE</b>	100		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone		Benchmark
	4	3	2	1

<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, 10/08/2023*

**Dean of IEM School**

*(Signature)*



**Assoc. Prof. Dr. Nguyen Van Hop**



## COURSE SYLLABUS

### Course Name: Smart Manufacturing Systems

Course Code: IS097IU

#### 1. General information

Course designation	This course explores how databases are designed, implemented, used and maintained, with an emphasis on industrial and commercial applications. We focus on the relational database model and learn the mathematics of structured queries
Semester(s) in which the course is taught	8
Person responsible for the course	
Language	English
Relation to curriculum	
Teaching methods	Lecture, lesson, assignment
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: Contact hours: 45 periods Private study including examination preparation, specified in hours <sup>1</sup> :
Credit points	3
Required and recommended prerequisites for joining the course	TBD
Course objectives	Impart knowledge of smart manufacturing for industry 4.0 for making student innovative

Course learning outcomes	Upon the successful completion of this course students will be able to:																				
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																			
	<b>Knowledge</b>	<b>CLO1. Understand application of hardware, communication protocol, IOT platform, machine learning etc. to implement IoT for smart manufacturing for the need of Industry 4.0</b>																			
	<b>Skill</b>	<b>CLO2. Find the applications of all the areas &amp; identify different areas of IOT and Smart Manufacturing</b>																			
	<b>Attitude</b>	<b>CLO3. To give the exposure on machine learning algorithms and data analytics</b>																			
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight (hour)</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td><b>Industry 4.0</b></td> <td><b>5</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Artificial Intelligence &amp; Augmented reality in Manufacturing.</b></td> <td><b>10</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Human-Robot Collaboration, Interoperability</b></td> <td><b>10</b></td> <td><b>I, T</b></td> </tr> <tr> <td><b>Data Analytics</b></td> <td><b>10</b></td> <td><b>T, U</b></td> </tr> <tr> <td><b>Application Domains</b></td> <td><b>10</b></td> <td><b>T, U</b></td> </tr> </tbody> </table>			Topic	Weight (hour)	Level	<b>Industry 4.0</b>	<b>5</b>	<b>I, T</b>	<b>Artificial Intelligence &amp; Augmented reality in Manufacturing.</b>	<b>10</b>	<b>I, T</b>	<b>Human-Robot Collaboration, Interoperability</b>	<b>10</b>	<b>I, T</b>	<b>Data Analytics</b>	<b>10</b>	<b>T, U</b>	<b>Application Domains</b>	<b>10</b>	<b>T, U</b>
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Examination forms	Writing questions																				
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																				
Reading list	<ol style="list-style-type: none"> <li><b>Gilchrist, A.</b>, “<i>Industry 4.0: the industrial internet of things</i>”, Apress, 2016</li> <li><b>Rawat, D. B., Brecher, C., Song, H., &amp; Jeschke, S.</b> (2017)., “<i>Industrial Internet of Things: Cybermanufacturing Systems</i>”, Springer, 2017.</li> <li><b>Shalev-Shwartz, S., &amp; Ben-David, S.</b>, “<i>Understanding machine learning: From theory to algorithms</i>”, Cambridge university press, 2014.</li> <li><b>Masoud Soroush, McKetta Michael Baldea, &amp; Thomas Edgar</b> (2020). “<i>Smart Manufacturing: Concepts and Methods</i>”, Elsevier, 2020.</li> </ol>																				

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO	SLO					
	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Basic principles and technologies of a Smart Manufacturing Systems	1			
2	Digitalization and the Networked Economy, Globalization and Emerging Issues	2			
3	Cyber-Physical Systems and Cyber-Physical Production Systems	3			
4	Smart workpiece, Digital Twins in Production, Assistance systems for production	3			
5	Blockchain	3			
6	Communication systems and standards for Industry 4.0 and cloud applications	3			
7	Cloud Manufacturing and the connected factory, cyber security	3			
8	Artificial Intelligence in Production: Machine Learning Application	3			
9	Data Analytics: Introduction, Importance and characteristics of Big Data, Size of Big Data	3			
10	Data Analytics: Types of analytics, Model Complexity, Over and Under-fitting	3			
11	Data Analytics: Data Processing prior to Machine Learning, Data Visualization				
12	Data Analytics: Machine Learning Library, analytics method and modelling	3			



13	Data Management with Python. Security	3			
14	Application Domains: Factories and Assembly Line, Food Industry, Healthcare, Power Plants,	3			
15	Application Domains: Inventory Management & Quality.	3			
16	Final Exam Final Report Due				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes Homework, (30%)	Qz, HW 60% Passes	Qz, HW 60% Passes		Qz, HW 60% Passes
Midterm exam (30%)	Q1 50% Passes	Q2 50% Passes	Q3, Q4 50% Pass	
Final exam (40%)		Q1 50% Passes	Q 2 50% Pass	Q 3, 4 50% Passes

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (65%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		

<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<b>Capstone 4</b>	<b>Milestone</b>		<b>Benchmark 1</b>
		<b>3</b>	<b>2</b>	
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

**6. Date revised:**

*Ho Chi Minh City, 10/08/2023*

*Dean of School of Industrial Engineering and Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.', representing the name of the signatory.

**Assoc. Prof. Dr. Nguyen Van Hop**



## COURSE SYLLABUS

### Course Name: Advanced Modeling and Prototyping

Course Code: IS098IU

#### 1. General information

Course designation	Advanced Modeling and Prototyping
Semester(s) in which the course is taught	
Person responsible for the course	<i>Please indicate a specific person.</i>
Language	English
Relation to curriculum	<i>Compulsory / elective / specialisation</i> <i>Names of other study programmes with which the module is shared</i>
Teaching methods	<i>Lecture, Lab, Project</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload:</i> <i>Contact hours: 45 periods</i> <i>Private study including examination preparation, specified in hours<sup>1</sup>:</i>
Credit points	3
Required and recommended prerequisites for joining the course	CAD/CAM

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	To teach students the virtual prototyping, product data management (PDM), reverse engineering (RE) and rapid prototyping (RP) technologies and their applications in product development.																				
Course learning outcomes	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																			
	<b>Knowledge</b>	<b>CLO1. Apply principles of product structure modeling and its application in product design and development</b> <b>CLO2. Understand basic concepts and knowledge of PDM</b>																			
	<b>Skill</b>	<b>CLO3. Able to employ the computer-aided design (CAD) computer-aided engineering (CAE), rapid prototyping, reverse engineering techniques for prototyping of design concepts</b>																			
	<b>Attitude</b>	<b>CLO4. Cooperates in group activities</b>																			
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight (hour)</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Product Structure Modeling</td> <td>3</td> <td>T</td> </tr> <tr> <td>Product Data Management</td> <td>3</td> <td>I</td> </tr> <tr> <td>Virtual Prototyping</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Reverse Engineering</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Rapid Prototyping Technology</td> <td>3</td> <td>T, U</td> </tr> </tbody> </table>			Topic	Weight (hour)	Level	Product Structure Modeling	3	T	Product Data Management	3	I	Virtual Prototyping	3	T, U	Reverse Engineering	3	T, U	Rapid Prototyping Technology	3	T, U
Topic	Weight (hour)	Level																			
Product Structure Modeling	3	T																			
Product Data Management	3	I																			
Virtual Prototyping	3	T, U																			
Reverse Engineering	3	T, U																			
Rapid Prototyping Technology	3	T, U																			
Examination forms	Exam, Project																				
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																				

Reading list	<p>1. R. Budde, <i>Prototyping: An Approach to Evolutionary System Development</i>, Springer-Verlag, Berlin, New York, latest edition.</p> <p>2. <i>Rapid Prototyping</i>, CK Chua, KF Leung, SC Lim, World Scientific, latest edition.</p> <p>3. B. Benhabib, <i>Manufacturing: Design, Production, Automation and Integration</i>, Marcel Dekker, latest edition.</p> <p>4. P.N. Rao, <i>CAD/CAM Principles and Applications</i>, McGraw Hill, latest edition.</p> <p>5. S. Kalpakjian, S. Schmid, <i>Manufacturing engineering and technology</i>, Prentice Hall, latest edition.</p>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) and Program/Student Learning Outcomes (SLO) is shown in the following table:

CLO	SLO						
	1	2	3	4	5	6	7
1	x	x					
2							x
3		x				x	
4			x		x		

### *Program/Student Learning Outcomes (SLO)*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*
3. *an ability to communicate effectively with a range of audiences.*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-3	Product Structure Modeling	1	Exam		

	<ul style="list-style-type: none"> <li>- Product structure concepts.</li> <li>- The modeling process.</li> <li>- Process date model</li> <li>- Plastic Processing.</li> <li>- case studies</li> </ul>				
4-6	<ul style="list-style-type: none"> <li>Product Data Management</li> <li>- Background and basic concepts</li> <li>- PDM systems</li> <li>- Applications and case studies</li> </ul>	2	Exam		
7-9	<ul style="list-style-type: none"> <li>Virtual Prototyping</li> <li>- Background ground, business drivers and basic concepts.</li> <li>- Enabling technologies</li> <li>- Applications and case studies.</li> </ul>	1,3,4	Exam, Project	Use CAD/CAM	
10-12	<ul style="list-style-type: none"> <li>Reverse Engineering</li> <li>- Background ground, business drivers and basic concepts.</li> <li>- Enabling technologies</li> <li>- Applications (Application filed and prospect of RE, steps in RE, technologies applied in RE, 3D scanning and digitizing).</li> </ul>	1,3,4	Exam, Project	Use 3D scanning	
13-15	<ul style="list-style-type: none"> <li>Rapid Prototyping Technology</li> <li>- Rapid Prototyping Processes and Interfacing.</li> <li>- Rapid Tooling.</li> <li>- Safety and Environmental Control in RP.</li> </ul>	1,3,4	Exam, Project	Using RP technology to make real parts	

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes Homework, (15%)	70% Pass	70% Pass		
Lab (15%)			70% Pass	
Project (30%)			70% Pass	
Final exam (40%)	70% Pass	70% Pass	70% Pass	

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)



### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
Part 1..... (...%)			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
Part 2..... (...%)			
Criterion 1 ...:			
Criterion ...:			
Part 3..... (...%)			
Criterion 1...:			
Criterion ...:			
Part ..... (...%)			
<b>TOTAL SCORE</b>		<b>100</b>	

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1

<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, 10/08/2023*  
*Head/Dean of Department/School*  
*(Signature)*



**Assoc. Prof. Dr. Nguyen Van Hop**



## COURSE SYLLABUS

### Course Name: Industrial & Commercial Data Systems

Course Code: IS099IU

#### 1. General information

Course designation	This course explores how databases are designed, implemented, used and maintained, with an emphasis on industrial and commercial applications. We focus on the relational database model and learn the mathematics of structured queries
Semester(s) in which the course is taught	8
Person responsible for the course	
Language	English
Relation to curriculum	
Teaching methods	Lecture, lesson, assignment
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: Contact hours: 45 periods Private study including examination preparation, specified in hours <sup>1</sup> :
Credit points	3
Required and recommended prerequisites for joining the course	TBD

Course objectives	Students will gain experience with MS Access, a commercial database management system, and will work in teams to design and implement a prototype database system for a local organization.		
Course learning outcomes	Upon the successful completion of this course students will be able to:		
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	
	<b>Knowledge</b>	<b>CLO1. Develop a concepts of Industrial commercial database.</b>	
	<b>Skill</b>	<b>CLO2. Understand and Analyze the relational database model and learn the mathematics of structured queries</b>	
	<b>Attitude</b>	<b>CLO3. Ability to work in teams to design and implement a prototype database system.</b>	
Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight (hour)</b>	<b>Level</b>
	<i>Overview &amp; Formal Logic</i>	3	I, T
	<i>ER and EER Models</i>	3	I, T
	<i>Relational Algebra/ Relational Algebra Operators</i>	3	I, T
	<i>EER to Relational Design</i>	3	T, U
	<i>Structured Query Language</i>	3	T, U
	<i>Functional Dependency</i>	3	T, U
<i>Minimum Cover, Candidate Key Algorithms</i>	3	T, U	
<i>Normalization Theory</i>	3	T, U	
Examination forms	Writing questions		
Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		
Reading list	[1] <b>R. A. Elmasri and S. B. Navathe</b> , Fundamentals of Database Systems. Fourth Edition.:Benjamin/Cummings, 2003.		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO	SLO					
	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Entrance Exam, Overview, Formal Logic	1			MSA - Intro
2	Formal Logic, Individual Contact Reports Due	2			MSA - Tables
3	ER and EER Models, Design Team Assignments	3			
4	Relational Algebra, DP Team Proposals Due	3			MSA - Relationships
5	Feedback on DP Proposals; Relational Algebra	3			
6	EER to Relational Design Conversion, revised EER proposals due	3			MSA – Forms and reports
7	Relational Algebra	3			MSA – Forms plus
8	Relational Algebra Operators	3			MSA – Macros-Modules Internet
9	Structured Query Language	3			
10	Structured Query Language	3			MSA Queries-SQL
11	Mid-Term Review, Mid-Term				
12	Functional Dependency	3			
13	DP Review III (written) due; Inference Rules	3			
14	Minimum Cover, Candidate Key Algorithms	3			
15	Normalization Theory: Review of Practice	3			Final DP Presentations
16	Final Exam Final Report Due				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes Homework, (30%)	Qz, HW 60% Passes	Qz, HW 60% Passes		Qz, HW 60% Passes
Midterm exam (30%)	Q1 50% Passes	Q2 50% Passes	Q3, Q4 50% Pass	
Final exam (40%)		Q1 50% Passes	Q 2 50% Pass	Q 3, 4 50% Passes

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (65%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		
<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		
<b>Analysis and discussion demonstrate good subject mastery</b>	<b>35</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		
<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>		<b>100</b>	

##### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3.Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.



<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<b>Capstone</b> 4	<b>Milestone</b>		<b>Benchmark</b> 1
	3	2		
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

**6. Date revised:**

*Ho Chi Minh City, 10/08/2023*

***Head/Dean of Department/School***

*(Signature)*

A handwritten signature in blue ink, consisting of several fluid, connected strokes. The signature is centered below the text "(Signature)".

**Assoc. Prof. Dr. Nguyen Van Hop**



**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
*School of Industrial Engineering & Management*

**COURSE SYLLABUS**

**Course Name: Predictive Data Analytics and Applications**

Course Code: IS093IU

**1. General information**

Course designation	
Semester(s) in which the course is taught	
Person responsible for the course	<i>Please indicate a specific person.</i>
Language	
Relation to curriculum	<i>Compulsory / elective / specialisation Names of other study programmes with which the module is shared</i>
Teaching methods	<i>lecture, lesson, project</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 Private study including examination preparation, specified in hours<sup>1</sup>: 30</i>
Credit points	3
Required and recommended prerequisites for joining the course	

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<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	<p>The Predictive Analytics course is aimed at providing knowledge to the students on how to make prediction using machine learning techniques. While scientists are accustomed to make predictions based on consolidated and accepted theories, nowadays big data analytics is able to deliver predictions based on executing a sequence of data processing steps. The course explains both the analytics process as well as the techniques for making predictions.</p> <p>The course takes a broad predictive analytics project perspective, while identifying some of the key challenges faced, while making predictions. Selected techniques from the information-based and error-based prediction, time series, ANN and deep learning approaches will be studied in the course with supporting examples and use cases.</p>								
Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO1: Explain and use the concepts in predictive analytics</td> </tr> <tr> <td>Skill</td> <td>CLO2: Plan &amp; execute predictive analytics experiment</td> </tr> <tr> <td>Attitude</td> <td>CLO3: Describe the business situations where &amp; how predictive analytics would, or should, be used. Explain how predictive analytics is used to address organizational needs</td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1: Explain and use the concepts in predictive analytics	Skill	CLO2: Plan & execute predictive analytics experiment	Attitude	CLO3: Describe the business situations where & how predictive analytics would, or should, be used. Explain how predictive analytics is used to address organizational needs
Competency level	Course learning outcome (CLO)								
Knowledge	CLO1: Explain and use the concepts in predictive analytics								
Skill	CLO2: Plan & execute predictive analytics experiment								
Attitude	CLO3: Describe the business situations where & how predictive analytics would, or should, be used. Explain how predictive analytics is used to address organizational needs								

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>		
	<b>Topic</b>	<b>Weight (hour)</b>	<b>Level</b>
	Intro to Predictive Data Analytics and Applications	3	I, T, U
	Data to Insights to Decisions	3	I, T, U
	Data Exploration	3	I, T, U
	Information-Based Learning	6	I, T, U
	Similarity-Based Learning	3	I, T, U
	Probability-Based Learning	3	I, T, U
	Error-Based Learning	3	I, T, U
	Deep Learning	3	I, T, U
	Evaluation	3	I, T, U
	Unsupervised Learning	3	I, T, U
Examination forms	Project and Writing examination		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>		
Reading list	<p><i>John D. Kelleher, Brian Max Namee, Aoife D'Arcy, Fundamentals of Machine Learning for Predictive Data Analytics and Applications: Algorithms, Worked examples, and Case Studies. The MIT Press, 2nd edition, 2020.</i></p>		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-...) and Program/Student Learning Outcomes (SLO) (1-...) is shown in the following table:

CLO	SLO					
	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Intro to Predictive Data Analytics and Applications	1			
2	Data to Insights to Decisions	1			
3	Data Exploration	1			
4	Information-Based Learning part 1	1			
5	Information-Based Learning part 2	2			
6	Similarity-Based Learning	2			
7	Probability-Based Learning	2			
8	Midterm exam				
9	Error-Based Learning	2			
10	Deep Learning	2			
11	Unsupervised Learning	2			
12	Evaluation models	3			
13	Project presentation	3			
14	Review	3			
15	Final exam	3			

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	... 60% Pass	... 60% Pass	... ...%Pass
Project (20%)	... 50% Pass	... 50% Pass	... 50% Pass
Midterm (30%)	... 50% Pass	... 50% Pass	
Final (40%)	... 50% Pass	... 50% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

### 5. Rubrics (optional)

#### 5.1. Grading checklist

Grading checklist for Written Reports	
Student: .....	HW/Assignment: .....
Date: .....	Evaluator: .....

	Max.	Score	Comments
<b>Part 1..... (....%)</b>			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
<b>Part 2..... (....%)</b>			
Criterion 1 ...:			
Criterion ...:			
<b>Part 3..... (....%)</b>			
Criterion 1...:			
Criterion ...:			
<b>Part ..... (....%)</b>			
<b>TOTAL SCORE</b>	100		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytics rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>			<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
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<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.



<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
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*Source: Association of American Colleges and Universities*

## 6. Date revised:

*Ho Chi Minh City, 10/08/2023*

***Head/Dean of Department/School***

*(Signature)*



**Assoc. Prof. Dr. Nguyen Van Hop**



## COURSE SYLLABUS

### Course Name: Decision Analytics

Course Code: IS100IU

#### 1. General information

Course designation	<i>Decision Analytics</i>
Semester(s) in which the course is taught	
Person responsible for the course	<i>Please indicate a specific person.</i>
Language	English
Relation to curriculum	<i>Compulsory / elective / specialisation</i> <i>Names of other study programmes with which the module is shared</i>
Teaching methods	<i>Lecture</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload:</i> <i>Contact hours: 45 periods</i> <i>Private study including examination preparation, specified in hours<sup>1</sup>:</i>
Credit points	3
Required and recommended prerequisites for joining the course	Statistics and Probability

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	To introduce students to key concepts and fundamental approaches in quantitative analysis, and provide a foundation for decision-analytic modeling	
Course learning outcomes	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO1. Apply quantitative tools and analysis to improve decision-making</b>
	<b>Skill</b>	<b>CLO2. Able to use a collection of tools which are readily applicable in real-world managerial decision making</b>
	<b>Attitude</b>	<b>CLO3. Have quantitative reasoning ability</b>

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight (hour)</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Decision problem &amp; decision tree</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Value of information</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Risk &amp; uncertainties</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Sensitivity analysis</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Probability, Tornado Charts</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Random variables dependencies</td> <td>1</td> <td>T</td> </tr> <tr> <td>Monte Carlo simulation</td> <td>1</td> <td>T</td> </tr> <tr> <td>Optimization</td> <td>1</td> <td>T</td> </tr> <tr> <td>System dynamic</td> <td>2</td> <td>T,U</td> </tr> <tr> <td>Choice Models and Multi-Sided Market</td> <td>1</td> <td>I</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight (hour)</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Structuring decision problem</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>The decision matrix</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Influence Diagrams &amp; Decision Trees</td> <td>2</td> <td>I, T, U</td> </tr> <tr> <td>Decisions under Ignorance</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Sensitivity Analysis</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Probability decisions Optimization</td> <td>2</td> <td>I, T, U</td> </tr> <tr> <td>Expected Value</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Utility Theory</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Decisions under Risk</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Causal Decision Theory Evidential Decision Theory</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Game Theory</td> <td>2</td> <td>I, T, U</td> </tr> <tr> <td>Simulation</td> <td>1</td> <td>I, T, U</td> </tr> </tbody> </table>	Topic	Weight (hour)	Level	Decision problem & decision tree	2	T, U	Value of information	2	T, U	Risk & uncertainties	2	T, U	Sensitivity analysis	2	T, U	Probability, Tornado Charts	1	T, U	Random variables dependencies	1	T	Monte Carlo simulation	1	T	Optimization	1	T	System dynamic	2	T,U	Choice Models and Multi-Sided Market	1	I	Topic	Weight (hour)	Level	Structuring decision problem	1	I, T	The decision matrix	1	I, T, U	Influence Diagrams & Decision Trees	2	I, T, U	Decisions under Ignorance	1	I, T, U	Sensitivity Analysis	1	I, T, U	Probability decisions Optimization	2	I, T, U	Expected Value	1	I, T, U	Utility Theory	1	I, T, U	Decisions under Risk	1	I, T, U	Causal Decision Theory Evidential Decision Theory	1	I, T, U	Game Theory	2	I, T, U	Simulation	1	I, T, U
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Examination forms	Exam, Project																																																																								

Study and examination requirements	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.  Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] Edwards, W., Miles, R. F., & Von Winterfeldt, D. (2007). <i>Advances in decision analysis</i> . Cambridge, New York.  [2] Clemen, R. T., & Reilly, T. (2013). <i>Making hard decisions with DecisionTools</i> . Cengage Learning.  [3] Peterson, M. (2017). <i>An introduction to decision theory</i> . Cambridge University Press.  <i>Practice: EXCEL</i>

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) and Program/Student Learning Outcomes (SLO) is shown in the following table:

CLO	SLO						
	1	2	3	4	5	6	7
1							
2							
3							
4							

### *Program/Student Learning Outcomes (SLO)*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*
3. *an ability to communicate effectively with a range of audiences.*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	<ul style="list-style-type: none"> <li>• Introduction and Course Logistics</li> <li>• Elements of a Decision Problem</li> <li>• Decision Tree Basics; TreePlan</li> </ul>	1,2,3	Assignments, Exam		
2	<ul style="list-style-type: none"> <li>• Sensitivity Analysis</li> <li>• Value of Perfect Information</li> </ul>	1,2,3	Assignments, Exam		
3	<ul style="list-style-type: none"> <li>• Value of Sample Information</li> </ul>	1,2,3	Assignments, Exam		
4	<ul style="list-style-type: none"> <li>• Risk Profiles</li> </ul>	1,2,3	Assignments, Exam	Case study	
5	<ul style="list-style-type: none"> <li>• Risk Attitudes and Utility Functions</li> </ul>	1,2,3	Assignments, Exam		
6	<ul style="list-style-type: none"> <li>• Competitive Decision Making</li> <li>• Modeling Bargaining and Negotiation</li> </ul>	1,2,3	Assignments, Exam	Case study	
7	<ul style="list-style-type: none"> <li>Thinking about Probabilities</li> <li>Introduction to Monte-Carlo Simulation</li> </ul>	1,2,3	Assignments, Exam		
8	<ul style="list-style-type: none"> <li>• Review of Probability Distributions</li> <li>• Tornado Charts</li> </ul>	1,2,3	Assignments, Exam		
9	<ul style="list-style-type: none"> <li>• Identifying Important Uncertainties</li> </ul>	1,2,3	Assignments, Exam	Case study	
10	<ul style="list-style-type: none"> <li>• Dependence among Random Variables</li> </ul>	1,2,3	Assignments, Exam	Case study	
11	<ul style="list-style-type: none"> <li>• Sensitivity Analysis</li> <li>• Transportation Problems</li> </ul>	1,2,3	Assignments, Exam		
12	<ul style="list-style-type: none"> <li>• Introduction to Optimization</li> <li>• Using Solver</li> </ul>	1,2,3	Assignments, Exam		
13	<ul style="list-style-type: none"> <li>• Introduction to System Dynamics</li> <li>• Causal Loops</li> </ul>	1,2,3	Assignments, Exam	Case study	
14	<ul style="list-style-type: none"> <li>• Building and Validating System Dynamics Models</li> </ul>	1,2,3	Assignments, Exam		
15	<ul style="list-style-type: none"> <li>• Choice Models and Multi-Sided Market</li> </ul>	1,2,3	Assignments, Exam	Case study	

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Structuring decision problem: <ul style="list-style-type: none"> <li>• Defining a Decision Analytic Structure</li> <li>• Developing Objectives and Attributes</li> </ul>	1,2,3	Assignments, Exam		[1] chapter 6 7
2	The decision matrix: states, outcomes, acts, rival formalizations Decision tree	1,2,3	Assignments, Exam		[3] chapter 2
3	Influence Diagrams and the Fundamental Objectives Hierarchy Decision Trees and the Objectives Hierarchy	1,2,3	Assignments, Exam		[2] chapter 3,4

4	Decisions under Ignorance <ul style="list-style-type: none"> <li>• Dominance</li> <li>• Maximin, Leximin, Maximax and the Optimism–Pessimism Rule</li> <li>• Minimax Regret</li> <li>• Insufficient Reason</li> <li>• Randomized Acts</li> </ul>	1,2,3	Assignments, Exam		[3] Chapter 3
5	Sensitivity Analysis: sensitivity graph Tornado diagram	1,2,3	Assignments, Exam		[2] Chapter 5
6	Probability Basics Value of Perfect/Imperfect Information Value of Sample Information	1,2,3	Assignments, Exam		[2] Chapter 7 [3] Chapter 6
7	Thinking about Probabilities Bayesian proba models	1,2,3	Assignments, Exam		[2] Chapter 7 [3] Chapter 6
8	Venn diagrams Discrete Probability Distributions  Introduction to Optimization- Using Solver	1,2,3	Assignments, Exam		[2] Chapter 7 [3] Chapter 6
Midterm exam					
9	Expected Value Bayes' Theorem The Problem of Unknown Priors	1,2,3	Assignments, Exam		[2] Chapter 7 [3] Chapter 6
10	Utility and Risk Preferences Utility Theory How to Construct an Ordinal Scale Hedging	1,2,3	Assignments, Exam		[1] Chapter 12
11	Can Utility be Measured on a Ratio Scale? Risk Aversion Causal vs. Evidential Decision Theory	1,2,3	Assignments, Exam		[3] Chapter 5 [3] Chapter 9
12	Decisions under Risk The Axiomatic Approach Risk Paradoxes: Allais, Ellsberg, St. Petersburg, Pasadena, Two-Envelope  Risks and Risk attitude	1,2,3	Assignments, Exam		[3] Chapter 4 [2] Chapter 14
13	Newcomb's Problem Causal Decision Theory Evidential Decision Theory	1,2,3	Assignments, Exam		[3] Chapter 9

14	Game Theory Basic Concepts and Zero-sum Games Nonzero-sum and Cooperative Games	1,2,3	Assignments, Exam Assignments, Exam	[3] Chapter 11, 12
15	Simulation simulation and decision-tree models Sequential simulation Introduction to Monte-Carlo Simulation	1,2,3		[2] Chapter 11

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes Homework,project (30%)	... ...%Pas s	... ...%Pas s	... ...%Pas s	... ...%Pass
Midterm (30%)	... ...%Pas s	... ...%Pas s	... ...%Pas s	... ...%Pass
Final exam (40%)	... ...%Pas s	... ...%Pas s	... ...%Pas s	... ...%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Part 1..... (...%)</b>			
<b>Criterion 1:</b>			
<b>Criterion 2:</b>			
<b>Criterion 3:</b>			
<b>Criterion ...:</b>			
<b>Part 2..... (...%)</b>			
<b>Criterion 1 ...:</b>			
<b>Criterion ...:</b>			
<b>Part 3..... (...%)</b>			



<b>Criterion 1...:</b>			
<b>Criterion ...:</b>			
<b>Part ..... (....%)</b>			
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	<b>Capstone</b> <b>4</b>	<b>Milestone</b>		<b>Benchmark</b> <b>1</b>
		<b>3</b>	<b>2</b>	
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

**6. Date revised:**

*Ho Chi Minh City, 10/08/2023*  
*Head/Dean of Department/School*  
*(Signature)*

A handwritten signature in blue ink, appearing to be 'N.V. Hop', written on a light-colored background.

**Assoc. Prof. Dr. Nguyen Van Hop**



VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY  
School of Industrial Engineering and Management

## COURSE SYLLABUS

### Course Name: Industrial Process, System Data Analysis and Modelling

Course Code: IS101IU

#### 1. General information

Course designation	
Semester(s) in which the course is taught	
Person responsible for the course	<i>Please indicate a specific person.</i>
Language	English
Relation to curriculum	<i>Compulsory / elective / specialisation</i> <i>Names of other study programmes with which the module is shared</i>
Teaching methods	<i>lecture, lesson, project</i>
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (45 lecture + 15 Lab) Private study including examination preparation, specified in hours: 30
Credit points	3
Required and recommended prerequisites for joining the course	Recommended:

Course objectives	<p>Industrial process, system data analysis and modelling is one of the key aspects of process systems engineering. It is a significant activity in most major companies around the world, driven by applications such as process optimization, design, and control. It presents a systematic approach to modelling covering model formulation, documentation, analysis, solution, and validation. Process models depend not only on the process itself, but also on the modelling goal. This course therefore, places its main emphasis on Industrial process, system data analysis and modelling for dynamic simulation and process control purposes. This course introduces a structured modelling methodology emphasizing the importance of the modelling goal and including key steps such as model verification, calibration, and validation. Focuses on novel and advanced modelling techniques such as discrete, hybrid, hierarchical, and empirical modelling. Illustrates the notions, tools, and techniques of process modeling with examples and advances applications.</p>									
Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO1 Students will gain deep understanding of the basic Industrial process, system data analysis and modelling techniques.</td> </tr> <tr> <td>Skill</td> <td>CLO2 Students will apply their knowledge to design solutions to different problems.</td> </tr> <tr> <td>Attitude</td> <td>CLO3 Students will have the ability to model and analyze process and system for a selected application.</td> </tr> </tbody> </table>		Competency level	Course learning outcome (CLO)	Knowledge	CLO1 Students will gain deep understanding of the basic Industrial process, system data analysis and modelling techniques.	Skill	CLO2 Students will apply their knowledge to design solutions to different problems.	Attitude	CLO3 Students will have the ability to model and analyze process and system for a selected application.
Competency level	Course learning outcome (CLO)									
Knowledge	CLO1 Students will gain deep understanding of the basic Industrial process, system data analysis and modelling techniques.									
Skill	CLO2 Students will apply their knowledge to design solutions to different problems.									
Attitude	CLO3 Students will have the ability to model and analyze process and system for a selected application.									

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>		
	<b>Topic</b>	<b>Weight (hour)</b>	<b>Level</b>
	A systematic approach to model building	3	I, T
	Conservation principles	3	I, T
	Constitutive relations	3	I, T
	Dynamic models—Lumped parameter systems	3	I, T
	Solution strategies for lumped parameter models	3	I, T
	Dynamic models—Distributed parameter systems	3	T, U
	Solution strategies for distributed parameter models	3	T, U
	Process model hierarchies	3	T, U
	Data acquisition and analysis	3	T, U
	Statistical model calibration and validation	3	T, U
	Analysis of dynamic process models	3	T, U
	Process modelling for control and diagnostic purposes	3	T,U
Modelling discrete event systems	3	T,U	
Examination forms	Project and Writing examination		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>		
Reading list	<p><i>Processing Modelling and Model Analysis, 1<sup>st</sup> Ed., Academic Press, Year: 2001</i></p> <p><i>Modern Structural Analysis: Modelling Process and Guidance, ThomasTelford, Year 2005</i></p>		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-...) and Program/Student Learning Outcomes (SLO) (1 -...) is shown in the following table:

	SLO
--	-----

CLO	1	2	3	4	5	6
1	x	x				
2			x	x		
3					x	x

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	A systematic approach to model building	1			
2	Conservation principles	1			
3	Constitutive relations	1			
4	Dynamic models—Lumped parameter systems	1			
5	Solution strategies for lumped parameter models	2			
6	Dynamic models—Distributed parameter systems	2			
7	Solution strategies for distributed parameter models	2			
8	Midterm	2			
9	Process model hierarchies				
10	Data acquisition and analysis	1			
11	Statistical model calibration and validation	1			
12	Analysis of dynamic process models	1			
13	Process modelling for control and diagnostic purposes	1			
14	Modelling discrete event systems	1			
15	Final exam	1			

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Homework (10%)	... 60% Pass	... 60% Pass	... ...% Pass
Project (20%)	... 50% Pass	... 50% Pass	... 50% Pass

Midterm (30%)	... 50% Pass	... 50% Pass	
Final (40%)	... 50% Pass	... 50% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Part 1..... (...%)</b>			
Criterion 1:			
Criterion 2:			
Criterion 3:			
Criterion ...:			
<b>Part 2..... (...%)</b>			
Criterion 1 ...:			
Criterion ...:			
<b>Part 3..... (...%)</b>			
Criterion 1...:			
Criterion ...:			
<b>Part ..... (...%)</b>			
<b>TOTAL SCORE</b>		100	

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone	Benchmark
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	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, 10/08/2023*  
*Dean of School of Industrial Engineering and*  
*Management*  
*(Signature)*



**Assoc. Prof. Dr. Nguyen Van Hop**



**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
**School of Industrial Engineering and Management**

**COURSE SYLLABUS**

**Course Name: MANUFACTURING PROCESSES**

Course Code: **IS087IU**

**1. General information**

<b>Course designation</b>	<i>This subject will provide students with basic background about the manufacturing processes of products by using machining technologies such as casting, forging, welding, turning, milling, grinding, . . . These are the basic machining processes and common use; students can apply and develop in manufacturing areas for produce new products with advanced technologies.</i>
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Nguyen Van Chung
<b>Language</b>	English
<b>Relation to curriculum</b>	Elective
<b>Teaching methods</b>	Lecture, lesson, Assignment
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	<b>Students will be provided a fundamental and advanced concept of the manufacturing processes, understand the functions of machining technologies. Ability to use the technologies for manufacture new products with advanced machining processes.</b>	
<b>Course learning outcomes</b>	<b>Upon the successful completion of this course students will be able to:</b>	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO1. Students will be able to Develop a fundamental and advanced concept of the manufacturing processes.</b>
	<b>Skill</b>	<b>CLO2. Students will be able to understand the functions of machining technologies</b>
	<b>Attitude</b>	<b>CLO3. Ability to use the technologies for manufacture new products with advanced machining processes.</b>

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
<b>Weight: lecture and practice session</b>			
<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>			
Topic	Content	Weight (hour)	Level
Introduction to Manufacturing	Manufacturing; Materials in manufacturing; Manufacturing Processes Chapter 1 (Rajender Singh) Chapter 1 (H.N. Gupta, et al)	1	I, T
Properties of Materials	Properties of Materials, Classification of Engineering materials; Ferrous metals; Non-Ferrous metal; Chapter 7 (Rajender Singh) Chapter 2 (H.N. Gupta, et al) Chapter 4 (Mikell P. Groover)	1	I, T
Mold and Casting	Introduction; Casting Technology; Metal casting Process. Chapter 12, 13 (Rajender Singh) Chapter 3, 4 (H.N. Gupta, et al)	2	T, U
Forging	Classification of forging, Die forging, Machine forging Chapter 14 (Rajender Singh) Chapter 2 unit2 (H.N. Gupta, et al)	1	T, U
Welding	Welding Process; Welding Technology; Welding Joints; Gas welding processes; Arc welding processes Chapter 17 (Rajender Singh) Chapter 9 (H.N. Gupta, et al) Chapter 29, 30 (Mikell P. Groover)	1	T, U
Sheet metal working	Cutting Operation; Bending operations; Drawing Chapter 18 (Rajender Singh) Chapter 20 (Mikell P. Groover)		
Lathe Operations	Center Lathe, Cutting tools, chuck, lathe operation. Chapter 1 unit 3 (H.N. Gupta, et al)		T, U

	Chapter 20, 21 (Rajender Singh) Chapter 21, 22 (Mikell P. Groover)		
<b>Midterm Exam</b>			
Milling Operations	<b>Basic milling process, Types of milling process, milling machines</b> Chapter 4 unit 3 (H.N. Gupta, et al) Chapter 24 (Rajender Singh)	3	T, U
Shaping Operations	Principle of working, cutting tools, shaping machine Chapter 2 unit 3 (H.N. Gupta, et al) Chapter 23 (Rajender Singh)	1	T, U
Grinding Operations	Analysis of the Grinding Process; Application consideration in Grinding; Grinding operations and grinding machines Chapter 25 (Mikell P. Groover)	1	T, U
Mechanical Advanced Machining Processes	Ultrasonic Machining; Water jet machining; Photochemical Milling; Electrodischarge machining; Laser beam machining Chapter 2, 3, 4, 5 (Hassan El-Hofy)	1	T, U
Lab: Machining Operations: Turning, Drilling, Milling	Handout	2	U
<b>Final Exam</b>			
<b>Examination forms</b>	Answer questions		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.		

<b>Reading list</b>	<p>[1] Rajender Singh, <i>Introduction to basic Manufacturing Processes and Workshop Technology</i>, New Age International (P) Limited, 2006.</p> <p>[2] H.N. Gupta, R.C. Gupta, Arun Mittal, <i>Manufacturing Processes</i>, New Age International (P) Limited, Publishers 2009.</p> <p>[3] Mikell P. Groover <i>Fundamentals of Modern Manufacturing</i>, John Wiley &amp; Son, 2010.</p> <p>[4] Hassan El-Hofy, <i>Advanced Machining Process</i>, Mc Graw – Hill, 2005</p> <p>[5] Kalpakjian and Schmid, <i>Manufacturing Engineering and Technology</i>, Prentice Hall, New Jersey, 2013.</p> <p>[6] DeGarmo, Black, and Kohser, <i>Materials and Processes in Manufacturing</i>, John Wiley &amp; Sons, Inc, New York, 2011</p>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2				x			
3						x	

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2	1.1b		1.3c					2.5b	2.6b
3		1.2a	1.3d		2.2b		2.4b	2.5 a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Manufacturing	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]
2	Properties of Materials	CLO 2	Quiz	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
3	Mold and Casting	CLO 3	Exercises, HW, Quiz	Lecture presentation, in-class discussion	Reading [1] , [2]
4	Forging	CLO 3	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [2]
5	Welding	CLO 3	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [2], [3]
6	Sheet metal work	CLO 3	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [3]
7	Lathe Operations	CLO 3	Exercises, HW, Quiz	Lecture presentation, in-class discussion	Reading [1] , [3]
8-9	Midterm				
10-11	Milling Operations	CLO 3	Exercises, HW, Quiz	Lecture presentation, in-class discussion	Reading [1]
12	Shaping Operations	CLO 3	Exercises, HW	Lecture presentation, in-class discussion	Reading [1]
13	Grinding Operations	3	Exercises, HW	Lecture presentation, in-class discussion	Reading [3]
14-15	Mechanical Advanced Machining Processes	CLO 3	Exercises	Lecture presentation, in-class discussion	Reading [4]
16-17	Lab: Machining Operations: Turning, Drilling, Milling	CLO 3	Practice	Practice	Handout
18	Final exam				



#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class Exercises, quizzes, homework (15%)	Quiz, HW 60% Pass	Quiz, HW 60% Pass	
Assignment,lab (15%)		80% Pass	
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (10%)	10		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence Selecting and using information to investigate a point of view or conclusion</b>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities


**6. Date revised: April 13th, 2022**

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

	<b>VIETNAM NATIONAL UNIVERSITY HCMC</b> <b>INTERNATIONAL UNIVERSITY</b> <b>School of Industrial Engineering and Management</b>
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**COURSE SYLLABUS**  
**Course Name: E-COMMERCE SYSTEMS**  
**Course Code: IS106IU**

**1. General information**

<b>Course designation</b>	<b>This course introduce students both theory and practice of conducting business over the Internet and World Wide Web, i.e., E-Commerce business. The content includes four sections introduction, business strategies, technologies and integration.</b>
<b>Semester(s) in which the course is taught</b>	<b>5</b>
<b>Person responsible for the course</b>	
<b>Language</b>	<b>English</b>
<b>Relation to curriculum</b>	<b>Compulsory</b>
<b>Teaching methods</b>	<b>Lecture, lesson, project.</b>
<b>Workload (incl. contact hours, self-study hours)</b>	<b>(Estimated) Total workload: 70</b> <b>Contact hours (please specify whether lecture and assignments): 45</b> <b>Private study including examination preparation, specified in hours<sup>1</sup>: 25</b>
<b>Credit points</b>	<b>3</b>

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>	<i>N.A</i>									
<b>Course objectives</b>	<b>Students will be provided with complete coverage of the key business and technology elements of electronic commerce (E-commerce). Students will be able to apply the real-world cases discussed upon entering the workforce and will be better prepared to succeed in their careers.</b>									
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td><b>CLO1. Students will be able to understand the key concepts of e-commerce systems recognize and solve complex tasks and problems across several disciplines from global, economic, environmental and societal aspects.</b></td> </tr> <tr> <td><b>Skill</b></td> <td><b>CLO2. Students will be able to identify, abstract, structure, formulate, practice, and solve e-commerce problems by applying business analytics techniques.</b></td> </tr> <tr> <td><b>Attitude</b></td> <td><b>CLO3. Students will have positive attitude in both self-learning and group work, especially working in groups solving and managing e-commerce system problems.</b></td> </tr> </tbody> </table>		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<b>CLO1. Students will be able to understand the key concepts of e-commerce systems recognize and solve complex tasks and problems across several disciplines from global, economic, environmental and societal aspects.</b>	<b>Skill</b>	<b>CLO2. Students will be able to identify, abstract, structure, formulate, practice, and solve e-commerce problems by applying business analytics techniques.</b>	<b>Attitude</b>	<b>CLO3. Students will have positive attitude in both self-learning and group work, especially working in groups solving and managing e-commerce system problems.</b>
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>									
<b>Knowledge</b>	<b>CLO1. Students will be able to understand the key concepts of e-commerce systems recognize and solve complex tasks and problems across several disciplines from global, economic, environmental and societal aspects.</b>									
<b>Skill</b>	<b>CLO2. Students will be able to identify, abstract, structure, formulate, practice, and solve e-commerce problems by applying business analytics techniques.</b>									
<b>Attitude</b>	<b>CLO3. Students will have positive attitude in both self-learning and group work, especially working in groups solving and managing e-commerce system problems.</b>									

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>			
	<b>Weight: lecture and practice session</b>			
	<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>			
	<b>Topic</b>	<b>Content</b>	<b>Weight (hour)</b>	<b>Level</b>
	Introduction to E-commerce & Technology Infrastructure	+ Evolution of E-commerce + Business Models + Internet Technologies + Benefits & Costs of E-Commerce	3	I
	Selling & Marketing on the Web	+ Revenue Models + Revenue Strategy + Marketing Strategies on E-commerce & Analytics	6	I, T, U
	Business-to-Business Activities	+ Purchasing, Logistics, Business Support Processes + Supply Chain Management using Internet Technologies & Analytics	6	I, T, U
	Social Networking & Environment	+ Social Networks + Mobile Commerce + Online Auctions	6	I, T, U
	<b>Midterm Exam</b>			
	Web Server Hardware & Software	+ Web Server Basics + Software for Web Servers	6	I, T, U
	E-Commerce Software & Security	+ Web Hosting + Databases + Online Security	6	I, T, U
	Payment Systems	+ Common Online Payment Methods + Payment Cards + Digital Cash	6	I, T, U
	Managing E-Commerce Implementation	+ Benefits and Costs of Online Business + Strategies & Managing & Implementation	6	U
<b>Final Exam</b>				
<b>Examination forms</b>	<b>Writing examination</b>			

<b>Study and examination requirements</b>	<p><b>Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</b></p> <p><b>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</b></p>
<b>Reading list</b>	<p><b><u>Recommend Textbooks:</u></b>  <b>Gary P. Schneider. (2017) <i>Electronic Commerce, 12th Edition.</i> Cengage Learning, Boston, MA.</b>  <b>Camm, J.D. (2017). <i>Essentials of Business Analytics (Second ed.)</i>. Boston, MA: Cengage Learning.</b></p> <p><b><u>Reference Textbooks:</u></b>  <b>Laudon, K. C. and Traver, C. G. (2020). <i>E-Commerce: Business, Technology, Society.</i> Pearson Education, 16th Edition.</b></p>

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Program/Student Learning Outcomes (SLO) (1-7) is shown in the following table:

	PLO/SLO						
CLO	1	2	3	4	5	6	7
1	X	X					X
2					X	X	
3			X	X			

### *Student Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate*



*learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1									
2									
3									

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Electronic Commerce & Technology Infrastructure	CLO 1		Lecture presentation, in-class discussion	Reading [1]
2-3	Selling on the Web Marketing on the Web & Analytics	CLO 1,2	Group assignment task 1 –	Lecture presentation, in-class discussion	Reading [1], [2]
4-5	Business-to-Business Activities: Improving Efficiency and Reducing Costs & Analytics	CLO 1,2	Group assignment task 2 –	Lecture presentation, in-class discussion	Reading [1], [2]
6-7	Social Networking, Mobile Commerce, and Online Auctions	CLO 1, 2	Group assignment task 3 –	Lecture presentation, in-class discussion	Reading [1]
	<b>Midterm</b>				
8-9	Web Server Hardware and Software	CLO 1	Group assignment task 4 –	Lecture presentation, in-class discussion	Reading [1]
10-11	Electronic Commerce Security	CLO 1,2	Group assignment task 5 –	Lecture presentation, in-class discussion	Reading [1]
12-13	Payment Systems for Electronic Commerce	CLO 1,2	Group assignment task 6 –	Lecture presentation, in-class discussion	Reading [1]

14	Managing Electronic Commerce Implementations	CLO 3	Report and oral presentation		Reading [1]
15	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Group assignment - tasks (10%)	Group assignment - tasks 60% Pass	Group assignment - tasks 60% Pass	
Group projects (20%)			Group project 80% Pass
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)	60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			

<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	<b>Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.</b>	<b>Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.</b>	<b>Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored,</b>	<b>Issue/ problem to be considered critically is stated without clarification or description.</b>

			boundaries undetermined, and/ or backgrounds unknown.	
<b>Evidence <i>Selecting and using information to investigate a point of view or conclusion</i></b>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation / evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/	Specific position (perspective, thesis/hypothesis ) takes into account the complexities of an issue. Others' points of view are	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

	hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/hypothesis).	acknowledged within position (perspective, thesis/hypothesis).		
Conclusions and related outcomes (implications and consequences )	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified .

Source: Association of American Colleges and Universities

*Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the

	supports the presentation or establishes the presenter's credibility/ authority on the topic.	establishes the presenter's credibility/ authority on the topic.	establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

**6. Date revised: April 14<sup>th</sup>, 2023**

*Ho Chi Minh City, 10/08/2023*  
**Dean of School of Industrial Engineering  
and Management**  
*(Signature)*



**Assoc. Prof. Dr. Nguyen Van Hop**



## COURSE SYLLABUS

### Course Name: COLD CHAIN SYSTEMS

Course Code: IS105IU

#### 1. General information

<b>Course designation</b>	<i>This is a course about the cold chain system, which is the technology and process that allows for the safe transport of temperature-sensitive goods and products along the supply chain. It relies heavily on science to evaluate and accommodate for the link between temperature and perishability such as: meat and seafood, produce, medical supplies and pharmaceuticals. Besides that, the course will introduce technologies that rely on physical means to ensure appropriate temperature conditions along the supply chain, and processes that consist of a series of tasks to prepare, store, transport, and monitor temperature-sensitive products.</i>
<b>Semester(s) in which the course is taught</b>	6 and 8
<b>Person responsible for the course</b>	<i>Logistics and Supply Chain Management Lecturers</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, lesson, project.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture and assignments): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.



<b>Credit points</b>	<b>3</b>	
<b>Required and recommended prerequisites for joining the course</b>	<i>Student have to complete the course of Principles of Logistic and Supply Chain Management and Warehouse Engineering Management</i>	
<b>Course objectives</b>	Students will be provided with knowledge and skills of fundamental concepts, business processes and basic models/tools to solve problems in different stages of cold chain systems. Students will be able to apply the real-world concepts discussed upon entering the workforce and will be better prepared to succeed in their careers.	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	CLO1. Students will be able to understand the key concepts of cold chain (CC) and cold chain systems (CCS), recognize and solve complex tasks and problems across several disciplines from global, economic, environmental and societal aspects.
	<b>Skill</b>	CLO2. Students will be able to identify, abstract, structure, formulate, and solve CC problems by applying principles of LSCM to evaluate, plan, choose and apply adequate methods.
	<b>Attitude</b>	CLO3. Students will have integrative knowledge of soft skills and foreign language, have positive leadership attitude in both self-learning and group work, especially working in groups solving CC problems.

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>			
	<b>Weight: lecture and practice session</b>			
	<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>			
	<b>Topic</b>	<b>Content</b>	<b>Weight (hour)</b>	<b>Level</b>
	Introduction to Cold Chain Systems	Cold Chain Management Historical and Modern Development Basic components for Cold Chain Cold Chain Regulations and Standards	3	I
	Cold chain logistics	Principles of Cold Chain Logistics Features of Cold Chain Logistics Structure of Cold Chain Logistics Traditional Supply Chain Versus Cold Chain Management	3	I
	Cold Chain Warehouse	Introduction to Cold Chain Warehouse Cold Chain Warehouse Operations Product Characteristics Facilities and Equipment in Cold Chain Warehouse	6	I, T, U
	Cold Chain transportation	Introduction to cold chain transportation Product Characteristics of the Commodities in transportation Multi-commodity Cold Storage Management Methods to Define Optimal Target Temperature in Transportation	3	I, T, U
	Cold chain last mile delivery	Introduction to cold chain last mile delivery Practices of cold chain last mile delivery Technologies and methods to improve efficiency of cold chain last mile delivery	3	I, T, U
Cold chain technologies and equipment	Thermometers Chart Recorder Time-temperature indicator Radio Frequency Identification and Sensors Wireless Sensor Networks and Internet	3	I, T, U	

		of Things in Cold Integration of Tools and Technologies for Cold Chain		
	<b>Midterm Exam</b>			
	Temperature Management in Cold Chain	Analysis on Product Characteristics of the Commodities Multi-commodity Cold Storage Management Optimal Target Temperature Methods to Define Optimal Target Temperature	3	I, T, U
	Quality Assessment in Cold Chain	Quality Assessment Using Wireless Sensors Respiratory Metabolism Quality Assessment Methodologies	6	I, T, U
	Design and Implementation of a Smart Cold Chain and Case Study	Smart Refrigerator: A Smart Appliance for Smart Home Common Issues and Challenges with Typical Refrigerator The essentials of a Smart Refrigerator Development of Smart Refrigerators Common Concerns About Smart Refrigerators Design and Development	6	I, T, U
	Cold Chain Practices	Food Cold Chain Medicinal Cold Chain Vaccine Cold Chain Socio-economic and Environmental Impacts of Cold Chain	6	I, T, U
	Group project presentation		3	U
	<b>Final Exam</b>			
<b>Examination forms</b>	<b>Writing examination</b>			
<b>Study and examination requirements</b>	<b>Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</b> <b>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</b>			

<b>Reading list</b>	<b>[1] Aung, M. M., &amp; Chang, Y. S. (2022). Cold Chain Management. Springer International Publishing AG.</b>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Program/Student Learning Outcomes (SLO) (1-7) is shown in the following table:

CLO	PLO/SLO						
	1	2	3	4	5	6	7
1		x					
2	x						
3			x		x		

### **Student Learning Outcomes**

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

	<b>ASIIN learning outcomes</b>

<b>CLO</b>	<b>1.1</b>	<b>1.2</b>	<b>1.3</b>	<b>2.1</b>	<b>2.2</b>	<b>2.3</b>	<b>2.4</b>	<b>2.5</b>	<b>2.6</b>
<b>1</b>									
<b>2</b>									
<b>3</b>									

### 3. Planned learning activities and teaching methods

<b>Week</b>	<b>Topic</b>	<b>CLO</b>	<b>Assessments</b>	<b>Learning activities</b>	<b>Resources</b>
<b>1</b>	Introduction to Cold Chain Systems	<b>CLO 1</b>		<b>Lecture presentation, in-class discussion</b>	<b>Reading [1] , [2]</b>
<b>2</b>	Cold chain logistics	<b>CLO 1,2</b>	<b>Group assignment – task 1</b>	<b>Lecture presentation, in-class discussion</b>	<b>Reading [1] , [2]</b>
<b>3-4</b>	Cold Chain Warehouse	<b>CLO 1,2</b>	<b>Group assignment – task 2</b>	<b>Lecture presentation, in-class discussion</b>	<b>Reading [1] , [2]</b>
<b>5</b>	Cold Chain transportation	<b>CLO 1, 2</b>	<b>Group assignment – task 3</b>	<b>Lecture presentation, in-class discussion</b>	<b>Reading [1] , [2]</b>
<b>6</b>	Cold chain last mile delivery	<b>CLO 1,2</b>	<b>Group assignment – task 4</b>	<b>Lecture presentation, in-class discussion</b>	<b>Reading [1] , [2]</b>
<b>7</b>	Cold chain technologies and equipment	<b>CLO 1, 2</b>	<b>Group assignment – task 5</b>	<b>Lecture presentation, in-class discussion</b>	<b>Reading [1] , [2]</b>
<b>8-9</b>	<b>Midterm</b>				
<b>10</b>	Temperature Management in Cold Chain	<b>CLO 1</b>	<b>Group assignment – task 4</b>	<b>Lecture presentation, in-class discussion</b>	<b>Reading [1] , [2]</b>

11-12	Quality Assessment in Cold Chain	CLO 1,2	Group assignment – task 5	Lecture presentation, in-class discussion	Reading [1] , [2]
13-14	Design and Implementation of a Smart Cold Chain and Case Study	CLO 1,2	Group assignment – task 6	Lecture presentation, in-class discussion	Reading [1] , [2]
15	Cold Chain Practices	CLO 1,2	Group assignment – task7	Lecture presentation, in-class discussion	Reading [1] , [2]
16	Group project presentation	CLO 3	Report and oral presentation		
17	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Group assignment - tasks (10%)	Group assignment - tasks 60% Pass	Group assignment - tasks 60% Pass	
Group projects (20%)			Group project 80% Pass
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)	60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant	15		

background and prior work			
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.



<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: April 13th, 2022

*Ho Chi Minh City, 10/08/2023*  
**Dean of School of Industrial Engineering  
and Management**  
*(Signature)*



**Assoc. Prof. Dr. Nguyen Van Hop**



**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
**School of Industrial Engineering and Management**

**COURSE SYLLABUS**

**Course Name: Creative thinking**

Course Code: **IS080IU**

**1. General information**

<b>Course designation</b>	This course highlights creative thinking process, mindset, skills and tools.
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Dr. Pham Huynh Tram
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, lesson, project, seminar.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (lecture):45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	Critical thinking

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Deliberate creative thinking is learnable. This course helps students uncover their creative potential by learning creative thinking process, mindset, skills and tools. The course is designed based on experiential learning through watching, reading, self reflection, discussions and project. Students are invited to to survey and practice creative thinking tools, explore and develop their own creative processes, and experience collaborative creative problem solving in teams. Invited speakers will present their stories and experiences with creative processes.																																									
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:																																									
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																																								
	<b>Knowledge</b>	<b>CLO1. Understand the creative thinking process and recognize its barriers</b>																																								
	<b>Skill</b>	<b>CLO2. Utilize creative thinking tools for solving problems</b>																																								
	<b>Attitude</b>	<b>CLO3. Have a creative thinking mindset</b>																																								
<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Basic tools for creative thinking - divergent/convergent thinking; wishes; assumption busting; GPS</td> <td>1</td> <td>U</td> </tr> <tr> <td>Intro to Creative Process</td> <td>1</td> <td>I</td> </tr> <tr> <td>Spark a revolution. – Reframe the problem</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Bring in the bees – Connect &amp; combine</td> <td>1</td> <td>T,U</td> </tr> <tr> <td>Build, build, build, jump – Think better</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Are you paying attention</td> <td>1</td> <td>T,U</td> </tr> <tr> <td>Think of coconuts – Constraints</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Marshmallow on top – Teamwork</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Move fast, break things. – Experiment If anything can go wrong, FIX IT – Mindset</td> <td>2</td> <td>T,U</td> </tr> <tr> <td>Intro to Design thinking</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Inside out &amp; outside in – everythingtogether</td> <td>1</td> <td>I</td> </tr> <tr> <td>Learning from experts</td> <td>2</td> <td>I</td> </tr> </tbody> </table>			Topic	Weight	Level	Basic tools for creative thinking - divergent/convergent thinking; wishes; assumption busting; GPS	1	U	Intro to Creative Process	1	I	Spark a revolution. – Reframe the problem	2	T, U	Bring in the bees – Connect & combine	1	T,U	Build, build, build, jump – Think better	1	T, U	Are you paying attention	1	T,U	Think of coconuts – Constraints	1	T, U	Marshmallow on top – Teamwork	1	T, U	Move fast, break things. – Experiment If anything can go wrong, FIX IT – Mindset	2	T,U	Intro to Design thinking	2	I, T	Inside out & outside in – everythingtogether	1	I	Learning from experts	2	I
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<b>Examination forms</b>	Writing, project presentation																																									

<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	[1] “Creativity”: InGenius: A Crash Course on Creativity, Tina Seelig [2] Thinkertoys – A handbook of creative thinking techniques, Michael Michalko (2006) [3] Tharp, T. (2005). The Creative Habit: Learn It and Use It for Life: A Practical Guide. New York: Simon & Schuster Paperbacks

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO	SLO						
	1	2	3	4	5	6	7
1	x			x	x		x
2	x			x	x		x
3	x			x	x		x

### Intended Learning Outcomes

#### Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

ASIIN learning outcomes									
CLO	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a, 1.1b 1.1c	1.2a 1.2b	1.3b 1.3,c 1.3d	2.1a 2.1b	2.2a	2.3a	2.4c	2.5b	2.6a 2.6b
2	1.1a, 1.1b 1.1c	1.2a 1.2b	1.3b 1.3,c 1.3d	2.1a 2.1b	2.2a	2.3a	2.4c	2.5b	2.6a 2.6b
3	1.1a, 1.1b 1.1c	1.2a 1.2b	1.3b 1.3,c 1.3d	2.1a 2.1b	2.2a	2.3a	2.4c	2.5b	2.6a 2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Basic tools for creative thinking - divergent/convergent thinking; wishes; assumption busting; GPS	2	HW	Class exercise	
2	Learning from experts- Expert presentation	1,3		Presentation	
3	Intro to Creative Process	1		Video watching	[1].0
4	Spark a revolution. – Reframe the problem	2,3	HW	Class exercise	[1].1
5	Bring in the bees – Connect & combine	2,3	HW	Class exercise Presentation	[1].2,[2].
6	Build, build, build, jump – Think better	2,3	HW	Class exercise Presentation	[1].3,[2].
7	Are you paying attention	2,3	HW	Class exercise Presentation	[1].4
8	Think of coconuts – Constraints	2,3	HW	Class exercise Presentation	[1].6
9	Midterm		Reflection writing		
10	Marshmallow on top – Teamwork	1,3	HW	Class exercise Presentation	[1].8
11	Move fast, break things. – Experiment If anything can go wrong, FIX IT – Mindset	1,3	HW	Class exercise	[1].9

				Presentation	
12	Intro to Design thinking	1,3	HW	Class exercise Presentation	
13	Inside out & outside in – everythingtogether	1,3	HW	Class exercise Presentation	[1].11
14	Learning from experts- Expert presentation	1,3		Presentation	
15	Final exam		Project presentation		

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class exercises (20%)		70% Pass	70% Pass
Homework exercises (10%)	70% Pass		
Midterm exam (30%)	Reflection writing 70% Pass		
Final exam (40%)	Presentation 70%Pass		Presentation 70%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		
<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		
<b>Analysis and discussion demonstrate good subject mastery</b>	<b>30</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		

<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 2022



*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a long horizontal stroke.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: SYSTEMS ENGINEERING**Course Code: **IS035IU****1. General information**

<b>Course designation</b>	Systems Engineering is the course of methods to developing and analyzing the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis
<b>Semester(s) in which the course is taught</b>	5
<b>Person responsible for the course</b>	Dr. Dao Vu Truong Son
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, Exercises, Assignment.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	Nil

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Systems Engineering is the course of methods to developing and analyzing the systems. This course provides the knowledge and skills necessary for the engineers in the development process and systems analysis (manufacturing and services): systems engineering processes, methods of evaluation, selection and integration of system components, system simulation, and assessment of reliability, availability, and serviceability of the systems.																																						
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:																																						
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																																					
	<b>Knowledge</b>	<b>CLO1. Understand the fundamentals and concepts of systems engineering and analysis. Analyze and evaluate existing systems</b> <b>CLO2. Understand and select the necessary components of a system.</b>																																					
	<b>Skill</b>	<b>CLO3. Use engineering methodology to develop or improve a system</b>																																					
	<b>Attitude</b>	<b>CLO4. Students will have positive attitude in both self-learning and group discussion with other disciplines related to engineering mechanic related problems.</b>																																					
<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Introduction to Systems Engineering</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Conceptual System Design</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Preliminary System Design</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Detail Design and Development</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>System Test, Evaluation, and Validation.</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Alternatives and Models in Decision Making</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Models for Economic Evaluation</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Control Concepts and Methods</td> <td>6</td> <td>I, T</td> </tr> <tr> <td>Design for Reliability</td> <td>6</td> <td>I, T</td> </tr> <tr> <td>Design for Maintainability</td> <td>3</td> <td>I, T</td> </tr> <tr> <td>Design for Producibility, Disposability, and Sustainability</td> <td>3</td> <td>I, T</td> </tr> </tbody> </table>			Topic	Weight	Level	Introduction to Systems Engineering	3	I, T	Conceptual System Design	3	I, T	Preliminary System Design	3	I, T	Detail Design and Development	3	I, T	System Test, Evaluation, and Validation.	3	I, T	Alternatives and Models in Decision Making	3	T, U	Models for Economic Evaluation	3	I, T	Control Concepts and Methods	6	I, T	Design for Reliability	6	I, T	Design for Maintainability	3	I, T	Design for Producibility, Disposability, and Sustainability	3	I, T
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<b>Examination forms</b>	Practice, Writing questions																																						

<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.  Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	Blanchard B.S., Systems Engineering and Analysis (5ed.), Prentice Hall, 2010.

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-6) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2		x					
3			x	x			
4					x	x	

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
- an ability to communicate effectively with a range of audiences*
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2b	1.3c	2.1a 2.1b			2.4a	2.5a	
3	1.1b 1.1c		1.3a 1.3c					2.5b	2.6a 2.6b
4	1.1c	1.2a	1.3b 1.3d		2.2b		2.4b	2.a	2.6a

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Systems Engineering	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].1
2	Conceptual System Design	1, 2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].2
3	Preliminary System Design	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 3
4	Detail Design and Development	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 4
5	System Test, Evaluation, and Validation.	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 5
6,7	Alternatives and Models in Decision Making	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 6
8	Review		Exercises		
9	Midterm				
10	Models for Economic Evaluation	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 7
11	Control Concepts and Methods	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1] 8
12	Design for Reliability	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].9
13	Design for Maintainability	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].10
14	Design for Producibility, Disposability, and Sustainability (optional)	1,2	Exercises, HW, Quiz	Lecture, Discussion, HW Inclass-Quiz	[1].11
15	Project presentation	3,4			

16	Review				
17	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Project (30%)			50% Pass	50% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (65%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	35		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (5%)	05		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

**6. Date revised: April 15, 2022**



*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*



## COURSE SYLLABUS

### Course Name: **INTERNATIONAL TRANSPORTATION & LOGISTICS**

Course Code: **IS067IU**

#### 1. General information

<b>Course designation</b>	<p><i>This course will provide the students with an understanding of both the fundamental role and importance of transportation and logistics in companies and in our society, and the complex environment in which transportation and logistics service is provided today.</i></p> <p><i>This course takes a managerial approach to teaching transportation and logistics concepts and issues, providing students the tools to adapt to this fast-paced and rapidly changing industry.</i></p>
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Assoc. Prof. Dr Ho, Thi Thu Hoa
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, lesson, discussion, project.
<b>Workload (incl. contact hours, self-study hours)</b>	<p>(Estimated) Total workload: 70</p> <p>Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45</p> <p>Private study including examination preparation, specified in hours<sup>1</sup>: 25</p>
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>	None									
<b>Course objectives</b>	Students will be provided with knowledge and skills of fundamental principles, concepts, operations processes of international transportation and logistics. Students will be able to apply the real-world concepts developed to a range of situations including the workplace and further study in their careers path and lifelong learning.									
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td> <p><b>CLO1.</b> Students will be able to describe key concepts and scope of international transportation and logistics</p> <p><b>CLO2.</b> Students will be able to analyze transportation costing and pricing, carrier strategy, information management and emerging technologies, transportation management strategy and process and propose solutions in the area of international transportation and logistics</p> </td> </tr> <tr> <td><b>Skill</b></td> <td><b>CLO3.</b> Students will be able to apply various methods to design international transportation and logistics systems.</td> </tr> <tr> <td><b>Attitude</b></td> <td><b>CLO4.</b> Students will have positive attitude in both self-learning and group project with other disciplines related to international transportation and logistics, especially solving related problems.</td> </tr> </tbody> </table>		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<p><b>CLO1.</b> Students will be able to describe key concepts and scope of international transportation and logistics</p> <p><b>CLO2.</b> Students will be able to analyze transportation costing and pricing, carrier strategy, information management and emerging technologies, transportation management strategy and process and propose solutions in the area of international transportation and logistics</p>	<b>Skill</b>	<b>CLO3.</b> Students will be able to apply various methods to design international transportation and logistics systems.	<b>Attitude</b>	<b>CLO4.</b> Students will have positive attitude in both self-learning and group project with other disciplines related to international transportation and logistics, especially solving related problems.
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>									
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<b>Skill</b>	<b>CLO3.</b> Students will be able to apply various methods to design international transportation and logistics systems.									
<b>Attitude</b>	<b>CLO4.</b> Students will have positive attitude in both self-learning and group project with other disciplines related to international transportation and logistics, especially solving related problems.									

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture and practice session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Topic	Weight (hour)	Level
	<b>Introduction to Transportation and Logistics in Supply Chain</b> ✓ <i>Transportation and Logistics in Supply chain</i> ✓ <i>Global Flows and Trade</i> ✓ <i>Economics of Transportation</i> ✓ <i>Transportation Planning</i>	3	I
	<b>Costing and Pricing for Transportation</b> ✓ <i>Market Considerations-Rates vs. Price</i> ✓ <i>Cost-of-service Pricing vs. Value-of-service Pricing Economics of Transportation</i> ✓ <i>Rate Making in Practice</i> ✓ <i>Pricing in Transportation Management</i>	3	I, T, U
	<b>Modes of Transport</b> ✓ <i>Overview of Transport modes</i> ✓ <i>Road transport</i> ✓ <i>Rail transport</i> ✓ <i>Air transport</i> ✓ <i>Maritime transport</i> ✓ <i>Inland waterway transport</i> ✓ <i>Pipeline</i> ✓ <i>Multimodal transport</i>	9	I, T, U
	<b>Private Transportation and Fleet Management</b> ✓ <i>Private Transportation</i> ✓ <i>Modal Types of Private Transportation</i> ✓ <i>Private Trucking &amp; Cost Analysis</i>	3	I, T, U
	<b>Third Party Logistics</b>	6	I, T, U

	<ul style="list-style-type: none"> <li>✓ <i>Outsourced Logistics Providers</i></li> <li>✓ <i>Overview of the 3PL Industry</i></li> <li>✓ <i>Overview of 3PL Users</i></li> <li>✓ <i>Establishing and Managing 3PL Relationships</i></li> <li>✓ <i>Strategic Needs of 3PL Users</i></li> </ul>		
	<p><b>Global Transportation</b></p> <ul style="list-style-type: none"> <li>✓ <i>Overview of Global Transportation</i></li> <li>✓ <i>Global Transportation Planning - Incoterms</i></li> <li>✓ <i>Global Transportation Execution</i></li> <li>✓ <i>Issues and Challenges for Global Supply Chains</i></li> </ul>	6	I, T, U
	<p><b>Transportation Risk Management</b></p> <ul style="list-style-type: none"> <li>✓ <i>The Concept and role of Risk management</i></li> <li>✓ <i>The Basic Risk Types</i></li> <li>✓ <i>Transportation Risk Management Process and Techniques</i></li> <li>✓ <i>Security Regulations and Initiatives</i></li> </ul>	3	I, T, U
	<p><b>Transportation Planning: Supply and Demand</b></p> <ul style="list-style-type: none"> <li>✓ <i>Transportation Supply</i></li> <li>✓ <i>Transportation Demand</i></li> </ul>	3	I, T, U
	<p><b>Route choice and static assignment</b></p> <ul style="list-style-type: none"> <li>✓ <i>Route Choice Models</i></li> <li>✓ <i>Assignment with Implicit Path Enumeration</i></li> </ul>	3	I, T
	<p><b>Transport Supply Network Design</b></p> <ul style="list-style-type: none"> <li>✓ <i>Transportation Supply Design Problem</i></li> <li>✓ <i>Models for Road Network Layout Design</i></li> <li>✓ <i>Models for Road Network</i></li> </ul>	3	I, T

	<table border="1"> <tr> <td><i>Capacity Design</i></td> <td></td> <td></td> </tr> <tr> <td>Group presentation and final exam preparation</td> <td>3</td> <td>U</td> </tr> </table>	<i>Capacity Design</i>			Group presentation and final exam preparation	3	U
<i>Capacity Design</i>							
Group presentation and final exam preparation	3	U					
<b>Examination forms</b>	Short-answer questions, Case-answer questions						
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>						
<b>Reading list</b>	<ol style="list-style-type: none"> <li>1. Coyle, John J., Robert A. Novack, Brian J. Gibson (2016), <i>Transportation A global supply chain perspective</i>, 8th edition. South-Western Cengage, Boston. (Core book)</li> <li>2. E. Cascetta (2009), <i>Transportations systems analysis: models and applications</i>. Springer</li> <li>3. Alan Harrison and et. (2014), <i>Logistics management and strategy competing through the supply chain (fifth edition)</i>, Pearson</li> <li>4. Thorben Seiler (2012), <i>Operative Transportation Planning Solutions in Consumer Goods Supply Chains</i>. Springer</li> <li>5. Rodrigue, J-P., Comitos, C., Slack, B. (2013) <i>The Geography of Transport Systems</i>, 3rd ed, Routledge: Albington</li> <li>6. Incoterms 2020</li> </ol>						

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2		x					
3						x	
4					x		

*Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,1.2b	1.3d	2.1a,2.1b	2.2a				
2	1.1b		1.3c	2.1 a 2.1 b			2.4a	2.5a	
3		1.2 a	1.3 d		2.2b		2.4b	2.5 a	
4	1.1 c		1.3 b						2.6 a

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Transportation and Logistics in Supply Chain	1		Lecture, discussion, Q&A	[1]. Chapter 1
2	Costing and Pricing for Transportation	1,2	HW1.1	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 4
3-4-5	Modes of Transport	1,2	HW1.2	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 5-6-7-8
6	Private Transportation and Fleet Management	1, 2	HW2.1	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 13

7-8	Third Party Logistics	2, 3	HW2.2	Warm up and review, lecture, discussion, role play, Q&A	[1]. Chapter 12
<b>9-10</b>	<b>Midterm</b>				
11-12	Global Transportation	3	HW3.1	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 10, 11, 14 [6] Incoterms 2020
13	Transportation Risk Management	1,2	HW3.2	Warm up and review, lecture, discussion, Q&A	[1]. Chapter 9
14	Transportation Planning: Supply and Demand	1,2	HW3.3	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 2-5-9
15	Route choice and static assignment	2, 3	HW4.1	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 5
16	Transport Supply Network Design	2, 3	HW4.2	Warm up and review, lecture, discussion, Q&A	[2]. Chapter 9
17	Group presentation and final exam preparation	3, 4	Presentation	Warm up and review, group work presentation, Q&A	
<b>18</b>	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class assignment (10%)	HW 1 60% Pass	HW2 60% Pass	HW3-HW4 60% Pass	
Group projects (20%)				Group project 80% Pass
Midterm exam (30%)	60% Pass	60% Pass		
Final exam (40%)		60% Pass	60% Pass	

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist



Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>			
<b>TOTAL SCORE</b>			
	<b>100</b>		

## 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1

<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence Selecting and using information to investigate a point of view or conclusion</b>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### **Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: April 15th, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and  
Management**

*(Signature)*

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: E-LOGISTICS AND E-SUPPLY CHAIN  
MANAGEMENT**Course Code: **IS062IU****1. General information**

<b>Course designation</b>	<i>This course introduces supply chain systems for e-commerce. Topics will cover all aspects of an e-supply chain system from different e-commerce models and e-supply chain structure, demand forecasting, e-procurement, customer segmentation and e-CRM, e-logistics system design, e-manufacturing. E-warehousing and e-fulfillment center, e-shipping and e-distribution system, and some OR applications in e-supply chain problems.</i>
<b>Semester(s) in which the course is taught</b>	1
<b>Person responsible for the course</b>	Assoc. Prof. Nguyen Van Hop
<b>Language</b>	English
<b>Relation to curriculum</b>	Elective
<b>Teaching methods</b>	Lecture, lesson, project
<b>Workload (incl. contact hours, self-study hours)</b>	<i>(Estimated) Total workload:45 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 42 lecture hours Private study including examination preparation, specified in hours<sup>1</sup>: 3 hrs for project presentation</i>
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>									
<b>Course objectives</b>	<p>This course aims to provide for students:</p> <ul style="list-style-type: none"> <li>• To understand the components of an e-supply chain system and how to efficiently manage, coordinate, improve, or design/re-design the whole e-supply chain system or its components;</li> <li>• To discuss practical issues in e-supply chain management as well as the solutions for such issues;</li> <li>• To develop skill in applying a variety of techniques to solve e-logistics/supply chain problems.</li> </ul>								
<b>Course learning outcomes</b>	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td><b>CLO1. Understanding the e-business models and the components of an e-supply chain system to support running smoothly these business processes. Comparing the differences between the traditional supply chain and the e-supply chain.</b></td> </tr> <tr> <td><b>Skill</b></td> <td><b>CLO2. Identify various issues in e-supply chain systems. Apply different optimization and advanced advanced knowledge of natural sciences, mathematics and engineering to solve complex problems arisen in e-Business processes by collecting input data, analyzing parameters, doing literature review, conducting detailed research and experiments, and interpretation of data and solutions.</b></td> </tr> <tr> <td><b>Attitude</b></td> <td><b>CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.</b></td> </tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<b>CLO1. Understanding the e-business models and the components of an e-supply chain system to support running smoothly these business processes. Comparing the differences between the traditional supply chain and the e-supply chain.</b>	<b>Skill</b>	<b>CLO2. Identify various issues in e-supply chain systems. Apply different optimization and advanced advanced knowledge of natural sciences, mathematics and engineering to solve complex problems arisen in e-Business processes by collecting input data, analyzing parameters, doing literature review, conducting detailed research and experiments, and interpretation of data and solutions.</b>	<b>Attitude</b>	<b>CLO3. Develop teamworking (leadership, organize, plan, and manage the projects), soft and professional (communication, decision making) skills and apply ethical practices to handle issues in the working environment.</b>
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<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Lecture 1: Introduction to supply chain management in e-Business</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 2: e-Business models</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 3: Forecasting demand with big data</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 4: e-Procurement</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 5: e-CRM</td> <td>2</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 6: Manufacturing in the age of e-Business</td> <td>1</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 7: e-Logistics</td> <td>2</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 8: e-Warehousing and e-fulfillment center</td> <td>2</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 9: e-Distribution and e-shipping</td> <td>2</td> <td>I, T, U</td> </tr> <tr> <td>Lecture 10: OR applications in e-supply chain</td> <td>1</td> <td>I, T, U</td> </tr> </tbody> </table>	Topic	Weight	Level	Lecture 1: Introduction to supply chain management in e-Business	1	I, T, U	Lecture 2: e-Business models	1	I, T, U	Lecture 3: Forecasting demand with big data	1	I, T, U	Lecture 4: e-Procurement	1	I, T, U	Lecture 5: e-CRM	2	I, T, U	Lecture 6: Manufacturing in the age of e-Business	1	I, T, U	Lecture 7: e-Logistics	2	I, T, U	Lecture 8: e-Warehousing and e-fulfillment center	2	I, T, U	Lecture 9: e-Distribution and e-shipping	2	I, T, U	Lecture 10: OR applications in e-supply chain	1	I, T, U
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<b>Reading list</b>	<p>Textbooks:</p> <ul style="list-style-type: none"> <li>- Chaffey D. and Hemphill T., Digital business and E-Commerce management, Pearson, 2019.</li> <li>- Ross D. F., Introduction to E-Supply Chain Management: Engaging Technology to Build Market – Winning Business Partnerships, St.Lucie Press, 2003. (e-book, <a href="https://www.scribd.com/document/51582619/e-supply-chain-book">https://www.scribd.com/document/51582619/e-supply-chain-book</a>)</li> <li>- Wang Y. and Pettit S., E-logistics: Managing your digital supply chains for competitive advantage, KoganPage, 2016.</li> </ul> <p>References:</p> <ul style="list-style-type: none"> <li>- Simchi-Levi D., Chen X., and Bramel J., The Logic of Logistics: Theory, Algorithms, and Applications for Logistics Management. Springer Series in Operations Research and Financial Engineering: 2014.</li> <li>- Deborah L. Bayles, <i>E-commerce Logistics and Fulfillment: Delivering the Goods</i>, Prentice Hall, 2001.</li> <li>- Graham, D., Manikas, I., and Folinias, D., <i>E-Logistics and E-Supply Chain Management: Applications for Evolving Business</i>, 1<sup>st</sup> edition, IGI Global, 2013.</li> <li>- Adam Robinson, <i>E-Commerce Logistics: Background &amp; Considerations for Manufacturers &amp; Distributors</i>, Cerasis, 2016, (e-book, <a href="http://cerasis.com/category/e-books/">http://cerasis.com/category/e-books/</a>)</li> <li>- Janice Reynolds, <i>Logistics and Fulfillment for E-Business: A Practical Guide to Mastering Back Office Functions for Online Commerce</i>.CMP Books, 2001</li> <li>- Dave Chaffey, <i>E-Business &amp; E-Commerce Management: Strategy, implementation, and practice, 5th ed.</i> Harlow: Pearson Education Limited, 2011.</li> <li>- Janice Reynolds, <i>Logistics and Fulfillment for E-Business: A Practical Guide to Mastering Back Office Functions for Online Commerce</i>.CMP Books, 2001</li> </ul>
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-...) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						x
2	x	x				x	
3			x	x	x		

### *Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*

6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a	2.3a	2.4c		
2		1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b		2.4a, 2.4b	2.5a	
3	1.1b,1 .1c		1.3a, 1.3b, 1.3c				2.4b	2.5a, 2.5b	2.6a, 2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to supply chain management in e-Business	1	Quiz/HW	Lecture Group forming. Class discussion Read book & lecture 2.	
2	Lecture 2: e-Business models	1	Quiz/HW	Lecture Class discussion Read book & lecture 3.	
3	Lecture 3: Forecasting demand with big data	1	Quiz/HW	Lecture Class discussion Read book & lecture 4.	
4 & 5	Lecture 4: e-Procurement	1	Quiz/HW	Lecture Class discussion Read book & lecture 5.	
6 & 7	Lecture 5: e-CRM	1, 2	Quiz/HW	Lecture Class discussion.	
	Midterm		Written Exam		
8	Lecture 6: Manufacturing in the age of e-Business	1, 2	Quiz/HW	Lecture Class discussion Read book & lecture 7.	
9 & 10	Lecture 7: e-Logistics	1, 2	Quiz/HW	Lecture Class discussion Read book & lecture 8.	
11 & 12	Lecture 8: e-Warehousing and e-fulfillment center	1, 2	Quiz/HW	Lecture Class discussion Read book & lecture 9.	
13	Lecture 9: e-Distribution and e-shipping	1, 2	Quiz/HW	Lecture Class discussion Read book & lecture 10	
14	Lecture 10: OR applications in e-SCM	1,2	Quiz/HW	Lecture Class discussion	
15	Project report and presentation	2,3	Project	Group presentations Class discussion	
	Final exam		Written Exam		



#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quizzes and homework (15%)	60% Pass	60% Pass	100% Pass
Project (15%)	60% Pass	60% Pass	100% Pass
Midterm Exam (30%)	60% Pass	60% Pass	90% Pass
Final Exam (40%)	60% Pass	60% Pass	90% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Semester Project Report			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Part 1. Problem (25%)</b>			
<b>Criterion 1: Problem Statement</b>	<b>10</b>		
<b>Criterion 2: Objectives of Study</b>	<b>5</b>		
<b>Criterion 3: Scope and Limitations</b>	<b>5</b>		
<b>Criterion 4: Literature Review</b>	<b>5</b>		
<b>Part 2. Proposed System Design and Solution (40%)</b>			
<b>Criterion 1: Proposed System</b>	<b>10</b>		
<b>Criterion 2: Proposed Solution</b>	<b>15</b>		
<b>Criterion 3: New Contribution</b>	<b>15</b>		
<b>Part 3. Results and Validation (35%)</b>			
<b>Criterion 1: Results</b>	<b>15</b>		
<b>Criterion 2: Validation</b>	<b>20</b>		
<b>TOTAL SCORE</b>		<b>100</b>	

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.

<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.
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Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

**6. Date revised: 10/5/2022**

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: FLEXIBLE MANUFACTURING SYSTEMS**Course Code: **IS043IU****1. General information**

<b>Course designation</b>	<i>This subject will provide the concept and method of flexible manufacturing system planning and control. The study covers: FMS technology, component, performance evaluation, and configuration planning.</i>
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Nguyen Van Chung
<b>Language</b>	English
<b>Relation to curriculum</b>	Elective
<b>Teaching methods</b>	Lecture, lesson, project
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	None

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	Students will be provided with skills of flexible manufacturing concepts; define the terms of Group Technology (GT) and apply GT concepts in a flexible manufacturing environment. Gain insight about the state-of-the-art research areas related to FMS and real-time shop floor control; plan and control flexible manufacturing system									
<b>Course learning outcomes</b>	<p><b>Upon the successful completion of this course students will be able to:</b></p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th> <th><b>Course learning outcome (CLO)</b></th> </tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td> <td><b>CLO1. Enable to know flexible manufacturing concepts. Gain insight about the state-of-the-art research areas related to FMS and real-time shop floor control.</b></td> </tr> <tr> <td><b>Skill</b></td> <td><b>CLO2. Define the terms of Group Technology (GT) and apply GT concepts in a flexible manufacturing environment. The components of FMS</b></td> </tr> <tr> <td><b>Attitude</b></td> <td><b>CLO3. To plan and control flexible manufacturing system.</b></td> </tr> </tbody> </table>		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	<b>Knowledge</b>	<b>CLO1. Enable to know flexible manufacturing concepts. Gain insight about the state-of-the-art research areas related to FMS and real-time shop floor control.</b>	<b>Skill</b>	<b>CLO2. Define the terms of Group Technology (GT) and apply GT concepts in a flexible manufacturing environment. The components of FMS</b>	<b>Attitude</b>	<b>CLO3. To plan and control flexible manufacturing system.</b>
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>									
<b>Knowledge</b>	<b>CLO1. Enable to know flexible manufacturing concepts. Gain insight about the state-of-the-art research areas related to FMS and real-time shop floor control.</b>									
<b>Skill</b>	<b>CLO2. Define the terms of Group Technology (GT) and apply GT concepts in a flexible manufacturing environment. The components of FMS</b>									
<b>Attitude</b>	<b>CLO3. To plan and control flexible manufacturing system.</b>									

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
<b>Weight: lecture and practice session</b>			
<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>			
Topic	Content	Weight (hour)	Level
Introduction to Flexible Manufacturing Systems	Flexibility; Introduction, Types of FMS FMS Application, Objectives of FMS Chapter 1 (H.K. Shivanand) Chapter 19 (Mikell P. Groover)	1	I, T
Introduction to Flexible Manufacturing Cell	Definition of Cell, Single – station manual/automated Cells, FMC, Differences between FMC and FMS Chapter 2 (H.K. Shivanand) Chapter 13, 14 (Mikell P. Groover)	1	I, T
Group Technology - Part classification – Coding systems	Introduction, Part families, Machine groups, Coding systems. Chapter 4 (H.K. Shivanand) Chapter 18 (Mikell P. Groover)	2	T, U
Group Technology – Production Flow Analysis	Production flow analysis, Benefits of Group Tecnology Chapter 4 (H.K. Shivanand) Chapter 8 (Mikell P. Groover)	2	T, U
Components of FMS	Workstations, Material Handling and storage system, Computer control system, FMC/FMS components Chapter 18, 19 (Mikell P. Groover)	1	T, U
<b>Midterm Exam</b>			
Automated Material Movement and Storage system	Automation in production systems; Fundamentals and applications of automated production/assembly lines, Analysis of transfer lines, AGV, ASRS, Industrial Robot Chapter 8 (H.K. Shivanand) Chapter 16 (Mikell P. Groover)	2	T, U
FMS software structure, functions, and Description	General Structure and Requirements, Activities and Functions to be Performed by FMS Software, Types of FMS Software Modules	2	U

		Chapter 11 (H.K. Shivanand)		
	FMS Installation and Implementation	FMS Installation, FMS implementation Chapter 12 (H.K. Shivanand)	1	U
	Computer Aided Process Planning	Introduction to CAPP, Approaches to process planning, Approaches to CAPP Chapter 16 (Mikell P. Groover)	1	T, U
	Lab: OpenCIM	Operation of openCIM OpenCIM, Intelitek	2	U
<b>Final Exam</b>				
<b>Examination forms</b>	Answer questions			
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.			
<b>Reading list</b>	<p>[1] H.K. Shivanand, M.M. Benal, V. Koti, <i>Flexible manufacturing System</i>, New Age International limited, Publishers, 2006.</p> <p>[2] Mikell P. Groover, <i>Automation, Production Systems, and Computer-Integrated Manufacturing</i>, 3rd edition, Prentice Hall, 2007.</p> <p>[3] Horst Tempelmeier, Heinrich Kuhn, <i>Flexible Manufacturing Systems: Decision Support for Design and Operation</i>, John Wiley &amp; Sons, 1993.</p> <p>[4] TekLink, CIM Technology 1, OpenCIM, Intelitek, 2003</p>			

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2				x			
3						x	

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*



4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a,1.2b	1.3d	2.1a,2.1b	2.2a				
2	1.1b		1.3c					2.5b	2.6b
3		1.2a	1.3d		2.2b		2.4b	2.5a	

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Flexible Manufacturing Systems	CLO 1		Lecture presentation, in-class discussion	Reading [1] , [2]
2	Introduction to Flexible Manufacturing Cell	CLO 1	Quiz	Lecture presentation, in-class discussion	Reading [1] , [2],
3-4	Group Technology - Part classification – Coding systems	CLO 2	Exercises, HW,	Lecture presentation, in-class discussion	Reading [1] , [2]
5-6	Group Technology – Production Flow Analysis	CLO 2	Exercises, HW, Quiz	Lecture presentation, in-class discussion	Reading [1] , [2]
7	Components of FMS	CLO 2	Exercises	Lecture presentation, in-class discussion	Reading [2]
8-9	<b>Midterm</b>				
10-11	Automated Material Movement and Storage system	CLO 2 CLO 3	Exercises, Quiz	Lecture presentation, in-class discussion	Reading [1], [2]
12	FMS software structure, functions, and Description	CLO 2 CLO 3	Exercises	Lecture presentation, in-class discussion	Reading [1], [3]

13	FMS Installation and Implementation	CLO 3	Exercises	Lecture presentation, in-class discussion	Reading [1], [3]
14-15	Computer Aided Process Planning	CLO 3	Exercises	Lecture presentation, in-class discussion	Reading [2]
16-17	Lab: OpenCIM, Lathe, Milling	CLO 3	Practice	Practice	Handout, Reading [4]
18	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
In-class Exercises, quizzes, homework (15%)	Quiz, HW 60% Pass	Quiz, HW 60% Pass	
Assignment, Lab (15%)		80% Pass	
Midterm exam (30%)	60% Pass	60% Pass	
Final exam (40%)		60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		

<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence Selecting and using information to investigate a point of view or conclusion</b>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.



*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*



**COURSE SYLLABUS**  
**Course Name: Leadership**  
Course Code: **IS045IU**

**1. General information**

<b>Course designation</b>	While typical leadership classes leave learners knowing about leadership and other leaders, the course is designed to give students actual access to being a leader and the effective exercise of leadership as their natural self-expression. This is achieved by exploring how listening, speech acts, and language are instrumental to being a leader; identifying blind spots; practicing new ways of being; accepting breakdowns; celebrating breakthroughs; keeping an open mind, rejecting preconceived notions, and being authentic. Topics include authentic listening, integrity, authenticity. Furthermore, students will discover how human brain's neural functioning, listening, and language fundamentally construct what we can perceive and accomplish as leaders in our relationships, organizations, families, and societies.
<b>Semester(s) in which the course is taught</b>	7
<b>Person responsible for the course</b>	Dr. Tran Duc Vi
<b>Language</b>	English
<b>Relation to curriculum</b>	Elective <i>BA</i>
<b>Teaching methods</b>	Lecture, project
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (lecture): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>	None																																						
<b>Course objectives</b>	<ol style="list-style-type: none"> <li>1. Understand the role of leadership and management. Know important leadership traits and styles.</li> <li>2. Understand different factors affecting the decision-making process and leadership effectiveness. Apply leadership models in practice.</li> <li>3. Communicate ideas coherently and effectively.</li> </ol>																																						
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:																																						
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																																					
	<b>Knowledge</b>	<b>CLO1 Understand the role of leadership and management and importance of leadership traits, styles.</b> <b>CLO2 Understand different factors affecting the decision-making process and leadership effectiveness.</b>																																					
	<b>Skills</b>	<b>CLO3 Apply leadership models in practice, communicate ideas coherently and effectively.</b>																																					
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<b>Examination forms</b>	Writing, project presentation
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
<b>Reading list</b>	<b>Textbook:</b> [1] Northouse, P., 2018. Leadership: Theory and Practice. SAGE Publications <b>Other required materials:</b> [2] Erhard, Werner and Jensen, Michael C. and Zaffron, Steve and Zaffron, Steve and Echeverria, Jeronima, Course Materials for: 'Being a Leader and the Effective Exercise of Leadership: An Ontological/Phenomenological Model' (February 1, 2022). Harvard Business School NOM Working Paper No. 09-038, Simon School Working Paper No. 08-03, Barbados Group Working Paper No. 08-02, Available at SSRN: <a href="https://ssrn.com/abstract=1263835">https://ssrn.com/abstract=1263835</a> or <a href="http://dx.doi.org/10.2139/ssrn.1263835">http://dx.doi.org/10.2139/ssrn.1263835</a>

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x	x				x	
2				x	x	x	x
3			x				

Intended Learning Outcomes (*ABET\_Student Outcomes*)

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*



The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a	2.3a	2.4c		
2		1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b		2.4a, 2.4b	2.5a	
3	1.1b,1 .1c		1.3a, 1.3b, 1.3c				2.4b	2.5a, 2.5b	2.6a, 2.6b

### 3. Planned learning activities and teaching methods

Week	Content	CLOs	Assessment	Learning Activities	Resources
1	Introduction	1.1, 1.2	HW	Lecture Project group forming Class Discussion Read Book	[1]
2	Already Always Listening	1.1, 1.2	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
3	Trait Approach	1.1, 1.2	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
4	Authentic Leadership	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
5	Integrity Part 1	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
6	Integrity Part 2	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
7	Skill Approach	1.1, 1.2, 2.1	HW, Midterm	Lecture Class Discussion Read Book	[1], [2]
8	Review for Midterm		Quiz	Class Discussion Problem solving	
9	Midterm Exam				
10	Foundation of Leadership	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
11	Adaptive Leadership	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion	[1], [2]

				Read Book	
12	Behavior – Style Approach	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
13	Situational Approach	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
14	Power of Context	1.2, 2.1, 2.2	HW, Final	Lecture Class Discussion Read Book	[1], [2]
15	Presentation	2.1, 2.2, 3	Project	Presentation Class Discussion	
16	Review for Final				
17	Final Examination				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Project (14%)	x	x	x
Homework, quiz, reflection (16%)		x	x
Midterm exam (30%)	x	x	x
Final exam (40%)	x	x	x

*Note: %Pass: Target 70% of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		
<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		
<b>Analysis and discussion demonstrate good subject mastery</b>	<b>30</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		
<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			

<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: June 2022

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.' followed by a flourish.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: Retail Management**Course Code: **IS082IU****1. General information**

<b>Course designation</b>	<i>This subject will provide the student with a comprehensive view of retailing and an application of marketing concepts in a practical retail managerial environment. As a potential marketing manager, this course will give students insight into the retailing environment of which students will be a part and allow students to make informed decisions in your interaction with retailers. The course also provides a good foundation for those interested in owning or running a small retail business or those interested in pursuing a retail career as a merchandise buyer or store manager.</i>
<b>Semester(s) in which the course is taught</b>	5
<b>Person responsible for the course</b>	MSc. Nguyen Hoang Huy
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Lecture, project.
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, etc.): 45 Private study including examination preparation, specified in hours <sup>1</sup> : 25
<b>Credit points</b>	3

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Required and recommended prerequisites for joining the course</b>	None	
<b>Course objectives</b>	Students will be provided with skills of using data from a variety of sources, be introduced to basic retailing principles and the scope of retailing and current technology along with future trends in the retailing. Through this unit, students will be able to build a Retail Store, will take the student from learning concepts to the application of the concepts through the creation of a retail concept and marketing plan. Industry professionals will provide students with real world experiences in this process.	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO1. Students have economic knowledge about basic retailing principles and the scope of retailing.</b> <b>CLO2. Students will understand current technology along with future trends in the retailing.</b>
	<b>Skill</b>	<b>CLO3. Students are able to cooperate with others, organize and implement projects to build a Retail Store, will take the student from learning concepts to the application of the concepts through the creation of a retail concept and marketing plan. Industry professionals will provide students with real world experiences in this process and present project to class.</b>
<b>Attitude</b>	CLO4. Students are able to communicate appropriately and work effectively in a team composed of diverse characteristics.	

<p><b>Content</b></p>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Introduction to the world of retailing</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Types of retailers</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Multichannel retailing</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Customer buying behavior</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Retail locations</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Retail site location</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Managing the Merchandise process</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Retail pricing</td> <td>1</td> <td>I, T</td> </tr> <tr> <td>Retail communication mix</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Store layout and design</td> <td>1</td> <td>I, T</td> </tr> </tbody> </table>	Topic	Weight	Level	Introduction to the world of retailing	1	I, T	Types of retailers	1	I, T	Multichannel retailing	1	I, T	Customer buying behavior	2	I, T	Retail locations	1	I, T	Retail site location	1	I, T	Managing the Merchandise process	1	I, T	Retail pricing	1	I, T	Retail communication mix	2	I, T	Store layout and design	1	I, T
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<p><b>Reading list</b></p>	<ol style="list-style-type: none"> <li>1) Michael Levy, Barton Weitz - Retailing Management, 8th Edition-McGraw-Hill_Irwin (2011)</li> <li>2) “Retailing 7th Edition” , Dunne, Lusch and Carver, Southwestern Cengage Learning</li> <li>3) “Logistics and Retail Management: Emerging Issues and New Challenges in the Retail Supply Chain, 3rd Edition”, John Fernie, Leigh Sparks, Kogan Page, 2009</li> <li>4) “Retail Management: A Strategic Approach PIE 12E”, Barry Berman / Joel R. Evans</li> </ol>																																	



## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1				x			x
2					x		
3		x					
4				x			

*Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	<b>1.1a, 1.1b, 1.1c</b>		<b>1.3c</b>			<b>2.3a</b>	<b>2.4c</b>	<b>2.5b</b>	<b>2.6b</b>
2	<b>1.1c</b>		<b>1.3b</b>						<b>2.6a</b>
3		<b>1.2b</b>	<b>1.3c</b>	<b>2.1a, 2.1b</b>			<b>2.4a</b>	<b>2.5a</b>	
4	1.1b		1.3c					<b>2.5b</b>	<b>2.6b</b>

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Lecture 1: Introduction to the world of retailing	1		Lecture, Group work	[1]. 1
2	Lecture 2: Types of retailers	1	HW 1	Lecture, Group work	[1].2
3	Lecture 3: Multichannel retailing	1	HW 2	Lecture, Group work	[1].3
4 and 5	Lecture 4 and 5: Customer buying behavior	1,2	HW 3	Lecture, Group work	[1]. 4
6	Lecture 6: Retail locations	1,2	HW 4 (part 1)	Lecture, Group work	[1]. 7
7	Lecture 7: Retail site location and revision for Midterm exam	1,2	HW 4 (part 2)	Lecture, Group work	[1]. 8
8 and 9	Midterm				
10	Lecture 8: Managing the Merchandise process	1	HW 5	Lecture, Group work	[1]. 12. 13.
11	Lecture 9: Retail pricing	2	HW 6	Lecture, Group work	[1]. 14
12&13	Lecture 10: Retail communication mix	1,2		Lecture, Group work	[1]. 15
14	Lecture 11: Store layout and design	2		Lecture, Group work	[1]. 17
15	Group presentation and revision for final exam	3,4	Project	Group presentation	
16	Final exam				

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Group Project (20%)			Projects report and presentation (60%Pass)	Projects report and presentation (60%Pass)
Homework exercises (10%)	HW1-5 50%Passes	HW3, HW4, HW6 50%Passes		

Midterm exam (30%)	Q1, Q2 50% Passes	Q3, Q4 50% Passes		
Final exam (40%)	Q1, Q2 50% Passes	Q3, Q4 50% Passes		

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

## 5. Rubrics (optional)

### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	<b>10</b>		
Introduction demonstrates thorough knowledge of relevant background and prior work	<b>15</b>		
Analysis and discussion demonstrate good subject mastery	<b>30</b>		
Summary and conclusions appropriate and complete	<b>5</b>		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	<b>5</b>		
Content clearly and logically organized, good transitions	<b>5</b>		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	<b>10</b>		
Clear and easy to read	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>			
<b>TOTAL SCORE</b>			
	<b>100</b>		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: March 23, 2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and Management**

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*




Vietnam National University – HCMC  
International University  
**School of Industrial Engineering and Management**

# **COURSE SYLLABUS**

**Course Code**  
**IS066IU**

**COURSE NAME**  
**DATA MINING IN SUPPLY CHAIN**

**2020**

	<b>VIETNAM NATIONAL UNIVERSITY HCMC INTERNATIONAL UNIVERSITY</b> <b>School of Industrial Engineering &amp; management</b>	Code: FormCS1/EV. Issued No: 1.20 Date of issued: 25/02/2020 Total pages: ...
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## COURSE SYLLABUS

### Course Name: Data Mining

Course Code: IS066IU

### RECORD OF REVISIONS

No.	Place	Content of revision	Date of revision

	Prepared by	Reviewed by	Approved by
<b>Full name</b>	Dao Vu Truong Son		
<b>Position</b>	Lecturer		
<b>Signature</b>			
<b>Date</b>	02/03/2020		



### 1. General Information

- Course Title
- + Vietnamese: Khai thác dữ liệu trong chuỗi cung ứng
- + English: Data mining in supply chains
- Course ID: IS0066IU
- Course type
  - General
  - Specialization
  - Skills
- Number of credits: 3
  - + Lecture: 3
  - + Laboratory: 0
- Prerequisites: Nil
- Parallel Course: Nil
- Previous course: Nil

- Fundamental
- Others: .....
- Project/ Internship/ Thesis

### 2. Course Description

An overview of business intelligence in the field of supply chain management and marketing. Addresses how to leverage business intelligence systems to define KPIs, sharpen the accuracy of forecasting and planning, track business activities, and deliver dashboards, scorecards, strategic reporting, and operational/real-time reporting to enhance decision making for supply chain and marketing. SAP business intelligence solution is introduced to illustrate the concepts.

### 3. Textbooks and Other Required Materials *(textbooks and references should be ≤ 5)*

#### Textbooks:

[1] “Data Mining: Concepts and Techniques, 3rd Edition”, Jiawei Han; Micheline Kamber; Jian Pei, Morgan Kaufmann

#### References:

#### Software:

### 4. Course goals

Goals (Gx)	Descriptions	Program Learning Outcomes		Level of Competence
		ABET *	CDIO	
G1	Understand major principles and concepts of data mining	1,2	1.3	Understand
G2	Select and apply data mining algorithms to build analytical applications	4,5,6,7	1.3, 3.1, 4.2	Apply





*\* ABET\_Student Outcomes*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

**5. Course learning outcomes (CLOs)**

*Course learning outcomes are described systematically and aligned with course goals. Active verbs are used to describe CLOs and able to measure and observe in a specific context. Teaching modes: I(Introduce); T (teach); U (Utilize).*

<b>CLOs (Gx.x)</b>	<b>Descriptions</b>	<b>Teaching Modes</b>
G1.1	understand the need for data mining in business contexts.	<b>I, T</b>
G1.2	understand fundamental concepts of ML/DM	<b>T</b>
G2.1	select and apply data mining algorithms to build analytical applications	<b>T</b>
G2.2	evaluate models and algorithms w.r.t. their accuracy	<b>T</b>

**6. Course Assessment**

<b>Assessment types</b>	<b>Assessment component</b>	<b>Course learning outcomes (CLOs) (Gx.x)</b>	<b>Percentage %</b>
A1. Process assessment	A1.1 Quiz	G1.1, G1.2	15
	A1.2 Homeworks	G1.1,G1.2,G2.1, G2.2	15
A2.Midterm assessment	A2.1 Midterm Exam	G1.1, G1.2, G2.1	30
A3. Final assesement	A3.1 Final Exam	G1.2, G2.1, G2.2	40



## 7. Course Content

### Theory

Week	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecturer	Student	
1	Introduction to DataMining	G1.1	- Lecture presentation	- Group forming. - Class discussion - Read book	- Quiz <b>A1.1</b>
2	Data preprocessing	G1.1	- Lecture presentation	- Class discussion - Read book	- Quiz <b>A1.1</b> - Homework <b>A1.2</b>
3	Data Warehousing and Online Analytical Processing	G1.1	- Lecture presentation	- Class discussion - Read book	- Quiz /HW <b>A1.1, A1.2</b>
4&5	Data Cube Technology	G1.1	- Lecture presentation	- Class discussion - Read book	- Homework <b>A1.2</b>
6 & 7	Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods	G2.1	- Lecture presentation	- Class discussion - Read book	- Quiz /HW <b>A1.1, A1.2</b>
8	Review for Midterm	G1.1, G1.2, G2.1	- Problems solving	- Class discussion	- Quiz /HW <b>A1.1, A1.2</b>
<b>Midterm exam</b>					<b>A2</b>
9 & 10	Developing Business Intelligence and Market Intelligence	G1.2 G2.2	- Lecture presentation	- Class discussion - Read book	- Quiz /HW <b>A1.1, A1.2</b>
11&12	Supply Market Intelligence	G1.2 G2.2	- Lecture presentation	- Class discussion - Read book	- Quiz /HW <b>A1.1, A1.2</b>
13	Developing Sourcing Strategy	G1.2 G2.2	- Lecture presentation	- Class discussion - Read book	- Quiz /HW <b>A1.1, A1.2</b>
14	Benchmarking	G1.2 G2.2	- Lecture presentation	- Class discussion	- Quiz /HW <b>A1.1, A1.2</b>
15	Review	G1.2 G2.1 G2.2	- Problems solving	- Class discussion	- Quiz /HW <b>A1.1, A1.2</b>
<b>FINAL EXAMINATION</b>					<b>A3</b>



### Laboratory

Week	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecturer	Student	
1					
2					

### 8. Course requirement and expectation

**Class Participation:** A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.

**Academic Honesty and Plagiarism:** Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all assignments are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.

### 9. Instructor information

<b>Department/Office</b>	School of Industrial Engineering & Management-International University, VNU-HCMC
<b>Address</b>	A2.504 – Quarter 6, Linh Trung Ward, Thu Duc District, HCMC
<b>Phone number</b>	
<b>Instructor 's name</b>	Dao Vu Truong Son
<b>Email</b>	dvtson@hcmiu.edu.vn

*Ho Chi Minh City, 02/03/2020*  
**Dean of Faculty/Department**



**COURSE SYLLABUS**  
**Course Name: Internship 1**  
Course Code: IS052IU

**1. General information**

<b>Course designation</b>	<i>This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning.</i>
<b>Semester(s) in which the course is taught</b>	1,2,3
<b>Person responsible for the course</b>	<i>MSc. Duong Vo Nhi Anh.</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	<i>Compulsory</i>
<b>Teaching methods</b>	Lecture, lesson, project, seminar.
<b>Workload (incl. contact hours, self-study hours)</b>	<i>(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours<sup>1</sup>: 25 A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor).</i>
<b>Credit points</b>	2
<b>Required and recommended prerequisites for joining the course</b>	None
<b>Course objectives</b>	The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial & Systems Engineering.

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course learning outcomes</b>	<b>Upon the successful completion of this course students will be able to:</b>	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO1. Students apply specialized knowledge through observing the operating processes of real companies. CLO2. Students have Academic research and writing: Empiricism understanding, methods of academic research and writing</b>
	<b>Skill</b>	<b>CLO3. Students are able to identify, abstract and structure technical and economic tasks and problems.</b>
	<b>Attitude</b>	<b>CLO4. Students will have integrative knowledge of soft skills, practical knowledge and foreign language.</b>
<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 15 working days is required (5 days visit factory, 5 days write report, 5 days to get approval from supervisor). Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company.</p>	
<b>Examination forms</b>	Report	
<b>Study and examination requirements</b>	<p>Class Participation: Students must complete the following forms and requirements:</p> <ul style="list-style-type: none"> <li>- Internship Registration: register internship through Edu soft or form.</li> <li>- Internship Application and Student Performance Record.</li> <li>- Supervisor &amp; Advisor Evaluations: This questionnaire helps ensure that the ISE receives a complete and fair assessment of each student's performance from the site supervisor and advisor. At the completion of the internship, students are responsible for requesting their site supervisor and advisor to complete, and send this form to their advisor and then submit to the Program Assistant.</li> <li>- Final Report: In order to receive credit and a final grade for an approved internship students, must submit the final report. See below for suggested final report requirements. This report is to be completed by the student and must be submitted to the Program Assistant no later than the due date (to be defined later). 10 points will be deducted from your final grade when the final report is submitted late.</li> </ul> <p>Academic Honesty and Plagiarism: Instances of academic dishonesty will not be tolerated. Fabrication (Falsifying or inventing any information, citation, or data ) or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade. For this class, all reports are to be completed by the individual student unless otherwise specified. Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for preparation, research, drafting, and the proper referencing of sources in preparing all assessment items.</p>	

<b>Reading list</b>	
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## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	<b>ILO</b>						
<b>CLO</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>1</b>	x						x
<b>2</b>	x						
<b>3</b>						x	
<b>4</b>				x			x

### *Intended Learning Outcomes*

#### *Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-4) and ASIIN learning outcomes is shown in the following table:

	<b>ASIIN learning outcomes</b>								
<b>CLO</b>	<b>1.1</b>	<b>1.2</b>	<b>1.3</b>	<b>2.1</b>	<b>2.2</b>	<b>2.3</b>	<b>2.4</b>	<b>2.5</b>	<b>2.6</b>
<b>1</b>	1.1a 1.1b 1.1c	1.2a 1.2b	1.3c, 1.3d	2.1b 2.1a	2.2a	2.3a	2.4c		
<b>2</b>		1.2a 1.2b	1.3d	2.1a, 2.1b	2.2a				
<b>3</b>		1.2a	1.3d		2.2b		2.4b	2.5a	
<b>4</b>	1.1a		1.3c			2.3a	2.4c		2.6a

	1.1b								
	1.1c								

### 3. Planned learning activities and teaching methods

Day	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Lecture	Student	
1	Lecture 1: Observation factory 1	CLO1,2 ,3,4	Lecture	Group forming	Quiz
2	Lecture 2: Observation factory 2	CLO1,2 ,3,4	Lecture	Group forming	Quiz
3	Lecture 3: Observation factory 3	CLO1,2 ,3,4	Lecture	Group forming	Quiz/HW
4	Lecture 4: Observation factory 4	CLO1,2 ,3,4	Lecture	Group forming	Quiz/HW
5	Lecture 5: Observation factory 5	CLO1,2 ,3,4	Lecture	Group forming	Homework
<i>Final report</i>					

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quizzes and homework (15%)	60%Pass	60%Pass	60%Pass	60%Pass
Project (15%)	60%Pass	60%Pass	60%Pass	60%Pass
Midterm Exam (30%)	60%Pass	60%Pass	60%Pass	60%Pass
Final Exam (40%)	60%Pass	60%Pass	60%Pass	60%Pass

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

### 5. Rubrics (optional)

#### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments

<b>Technical content (60%)</b>			
<b>Abstract clearly identifies purpose and summarizes principal content</b>	<b>10</b>		
<b>Introduction demonstrates thorough knowledge of relevant background and prior work</b>	<b>15</b>		
<b>Analysis and discussion demonstrate good subject mastery</b>	<b>30</b>		
<b>Summary and conclusions appropriate and complete</b>	<b>5</b>		
<b>Organization (10%)</b>			
<b>Distinct introduction, body, conclusions</b>	<b>5</b>		
<b>Content clearly and logically organized, good transitions</b>	<b>5</b>		
<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.



<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and

	polished and confident.	comfortable.	speaker appears tentative.	speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised:

*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and Management*

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*



**VIETNAM NATIONAL UNIVERSITY HCMC  
INTERNATIONAL UNIVERSITY**  
**School of Industrial Engineering and Management**

**COURSE SYLLABUS**

**Course Name: Internship 2**

Course Code: IS053IU

**1. General information**

<b>Course designation</b>	<i>This course is an internship and is designed to supplement traditional classroom-based learning with experiential learning. The internship provides students with the opportunity to practically apply knowledge gained in their courses of Industrial &amp; Systems Engineering.</i>
<b>Semester(s) in which the course is taught</b>	3
<b>Person responsible for the course</b>	<i>MSc. Duong Vo Nhi Anh.</i>
<b>Language</b>	English
<b>Relation to curriculum</b>	<i>Compulsory</i>
<b>Teaching methods</b>	Lecture, lesson, project, seminar.
<b>Workload (incl. contact hours, self-study hours)</b>	<i>A minimum of 320 working hours or 40 working days is required.</i>
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	None
<b>Course objectives</b>	<b>Student will be able to have practical work experience under supervision and guidance, have ability to apply theories and principles learned in academic coursework to specific situations with the internship experience, ability to learn by observing and analyzing the daily functioning of the work place and reflecting on how people within the organization carry out its mission, get motivated and confident about career options after graduating.</b>

<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO 1. Students will be able to understand different kinds of production and the background and philosophies of lean production, method to analyze existing systems and identify different kinds of waste.</b>
	<b>Skill</b>	<b>CLO 2. Students will be able to identify, abstract, and apply approaches used in implementing lean production such as 5S, stability, pull production, cellular arrangement and layout improvement, quick change</b>
	<b>Attitude</b>	<b>CLO 3. Students will have integrative knowledge of soft skills and foreign language, total productive maintenance, mistake reduction, standards, leveling, visual management to real-life problems</b>
<b>Content</b>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Internships can be with a variety of host organizations, including foreign companies, government agencies and private industries. A minimum of 320 working hours or 40 working days is required. Whether the students have arranged their internship themselves or have been assisted in arranging one by the program assistant or other lecturers, they should let the program assistant know once there is a problem with the internship. The program coordinator can either intervene appropriately or see if the students can be transferred to a different company. Students should be both supported and challenged and encouraged to take initiative and develop life-long learning skills. Each intern works under a site supervisor at the host organization and an advisor from IU (ISE's lecturer). The role of the site supervisor (or advisor) is to oversee the students and provide mentorship throughout the internship. The site supervisor and advisor will complete a performance evaluation form at the conclusion of the internship. Students will discuss their experiences through weekly reports and online discussions.</p>	
<b>Examination forms</b>	Report	
<b>Study and examination requirements</b>	<p><i>Report:</i> Students must have more than 50/100 points overall to pass this course.</p> <p><i>Attendance:</i> A minimum of 320 working hours or 40 working days is required.</p>	
<b>Reading list</b>		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x						
2	x	x				x	
3					x		x

### Intended Learning Outcomes

#### Criteria for Accrediting Engineering Programs, 2020-2021

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1		1.2a 1.2b	1.3d	2.1a 2.1b	2.2a				
2		1.2a 1.2b	1.3c 1.3d	2.1a, 2.1b	2.2a		2.4a, 2.4b	2.5a	
3	1.1a 1.1b, 1.1c		1.3b 1.3c			2.3a	2.4c		2.6a

### 3. Planned learning activities and teaching methods

Week	Content	CLOs (Gx.x)	Teaching and Learning activities		Assessment Activities
			Supervisor	Student	
1,2,3	Observation analysis and find out problem 1	CL01, 02,03	presentation	Class discussion	Quiz/HW
4,5,6	Observation analysis and	CL01, 02,03	presentation	Class discussio	Quiz/HW

	find out problem 2			n	
7,8,9	Observation analysis and find out problem 3	CL01, 02,03	presentation	Class discussio n	Quiz/HW
10,11 ,12	Observation analysis and find out problem 4	CL01, 02,03	presentation	Class discussio n	Quiz/HW
Final report					

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quizzes and homework (15%)	60% Pass	60% Pass	60% Pass
Project (15%)	60% Pass	60% Pass	60% Pass
Midterm Exam (30%)	60% Pass	60% Pass	60% Pass
Final Exam (40%)	60% Pass	60% Pass	60% Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		

<b>Presentation (20%)</b>			
<b>Correct spelling, grammar, and syntax</b>	<b>10</b>		
<b>Clear and easy to read</b>	<b>10</b>		
<b>Quality of Layout and Graphics (10%)</b>	<b>10</b>		
<b>TOTAL SCORE</b>	<b>100</b>		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

### *Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

### Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

6. Date revised: April 12, 2022



*Ho Chi Minh City, dd/mm/yyyy*  
*Dean of School of Industrial Engineering and*  
*Management*

*(Signature)*

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'N.V.H.'.

*Assoc. Prof. Dr. Nguyen Van Hop*

**COURSE SYLLABUS****Course Name: THESIS RESEARCH**Course Code: **IS048IU****1. General information**

<b>Course designation</b>	<i>This subject is a comprehensive study to develop problem solving skills for students. It also helps students know how to identify the problem, review related literatures, design a system for solving the problem, improve the current system, validate and analyze the results, and utilize all related knowledge to solve efficiently the problem..</i>
<b>Semester(s) in which the course is taught</b>	1, 2
<b>Person responsible for the course</b>	Assoc. Prof. Nguyen Van Hop
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Project
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 45 Contact hours: 15 (advising discussion) Private study including report and presentation preparation, specified in hours <sup>1</sup> : 30
<b>Credit points</b>	10
<b>Required and recommended prerequisites for joining the course</b>	

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course objectives</b>	This project is a semester-long, individual study taken at the last semester of the senior year. Students are required to solve a large-scale problem by designing a new system or developing a comprehensive solution to improve the current system. The new design or solution for improvement must take into account realistic constraints such as economic, social and environmental conditions.	
<b>Course learning outcomes</b>	Upon the successful completion of this course students will be able to:	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
	<b>Knowledge</b>	<b>CLO1. Know how to study a system. Know how to identify a specific problem that related to the economic, social and environmental consideration.</b>
	<b>Skill</b>	<b>CLO2. Apply engineering methods and holistic and systematic approaches to formulate and solve practical problem. Be able to conduct literature review related to the specific topic, collect sources information and analyze parameters, evaluate, choose, and apply adequate methods of modeling, simulation, design and implementation of technical and economic systems. Be able to design a new system or develop a solution to improve the current system in a large scale, subject to complicated and realistic constraints (economic, social and environmental) and conduct experiments and analyze the solutions using optimization tools and advanced knowledge of natural sciences, mathematics and engineering.</b>
<b>Attitude</b>	<b>CLO3. No cheating, regular meetings, on-time reports. Develop soft and professional skills ( communication, decision making, organize, plan, and manage the projects) and apply ethical practices to handle issues in the working environment. Be able to report and defend their research in both writing and speaking format.</b>	

<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	Weight: lecture session (3 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	Identify the problem, objectives, scope and limitation	<b>1 hr</b>	<b>I, U</b>
	Conduct literature review and study related theory	<b>4 hrs</b>	<b>I, U</b>
	Develop the system to figure out the solution for the studied problem	<b>3 hrs</b>	<b>U</b>
	Propose research plan and Proposal defense	<b>1 hr</b>	<b>U</b>
	Investigate the current system by identifying all of its inputs, outputs and realistic constraints, including economics, social and environmental to determine areas for improvement	<b>12 hrs</b>	<b>U</b>
	Design a new system or develop improvement solution to improve the system in a large scale with those complicated and realistic constraints.	<b>12 hrs</b>	<b>U</b>
	Implement the current and improvement systems	<b>6 hrs</b>	<b>U</b>
Data collection and validate the proposed solutions	<b>3 hrs</b>	<b>U</b>	
Write a final report and make presentation.	<b>3 hrs</b>	<b>U</b>	
<b>Examination forms</b>	Presentation, Report.		
<b>Study and examination requirements</b>	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/ Examination: Students must have more than 50/100 points overall to pass this course.		
<b>Reading list</b>	<i>Textbooks and Lecture Notes of related courses, scientific articles in research databases such as sciencedirect, Ieeexplore, Springer, etc.</i>		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-...) and Intended Learning Outcomes (ILO) (1-3) is shown in the following table:

CLO	PLO/SLO						
	1	2	3	4	5	6	7
1	x			x			
2	x	x				x	x
3			x	x	x		

*Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*

2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
  3. *an ability to communicate effectively with a range of audiences*
  4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
  5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
  6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
  7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*
8. The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1b	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a			2.5b	
2	1.1a, 1.1b, 1.1c	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b	2.3a	2.4c		
3	1.1b, 1.1c		1.3a 1.3b 1.3c					2.5b	2.6a 2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Identify the thesis problem: problem statement, objectives of study, scope and limitations	1	Report	Lecture advices Self-study and research	Internship 2 case study
2	Conduct current system process and literature review	1	Report	Lecture advices Self-study and research	Scientific databases
3	Identify research gap and proposed the solution system	1,2,7	Report	Lecture advices Self-study and research	
4	Propose research plan and Proposal defense	1	Report	Lecture advices Self-study and research	
5	Investigate the current system by identifying all of its inputs, outputs and realistic constraints, including	1,4	Report	Lecture advices Self-study and research	

	economics, social and environmental to determine areas for improvement				
6	Design a new system or develop improvement solution to improve the system in a large scale with those complicated and realistic constraints.	1,2,7	Report	Lecture advices Self-study and research	
7	Midway report		Midway report		
8	Implement the current and improvement systems	1, 2,7	Report	Lecture advices Self-study and research	
9	Data collection and validate the proposed solutions	6	Report	Lecture advices Self-study and research	
10	Final report and defense		Final Report		

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO4	CLO6	CLO7
Midway Report (20%)	Midway Report 60%Pass	Midway Report 60%Pass	60%Pass	0%Pass	60%Pass
Final Report (80%)	Final Report 60%Pass	Final Report 60%Pass	60%Pass	60%Pass	60%Pass

Note: %Pass: Target that % of students having scores greater than 50 out of 100.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist			
Student: .....		Topic: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Chapter 1: Introduction (10%)</b>			
Criterion 1: Problem statement	5		
Criterion 2: Objectives of Study	2		
Criterion 3: Scope and Limitations	3		
<b>Chapter 2: Literature Review (10%)</b>			
Criterion 1: Current System	2		
Criterion 2: Related Works	5		
Criterion 3: Research Gap(s) and Key Ref.	3		
<b>Chapter 3: Proposed System (20%)</b>			

<b>Criterion 1: Methodology Selection</b>	<b>10</b>		
<b>Criterion 2: Proposed Solution</b>	<b>10</b>		
<b>Chapter 4: Current System (15%)</b>			
<b>Criterion 1: Current Implementation</b>	<b>10</b>		
<b>Criterion 2: Areas for improvement</b>	<b>5</b>		
<b>Chapter 5: Improvement System (20%)</b>			
<b>Criterion 1: Proposed Improvement Solution</b>	<b>10</b>		
<b>Criterion 2: Implementation for Improvement Solution</b>	<b>10</b>		
<b>Chapter 6: Data Collection and Validation (20%)</b>			
<b>Criterion 1: Data Collection and Processing</b>	<b>5</b>		
<b>Criterion 2: Solution Validation</b>	<b>15</b>		
<b>Chapter 7: Report and Presentation (5%)</b>			
<b>Criterion 1: Report</b>	<b>2</b>		
<b>Criterion 2: Presentation</b>	<b>3</b>		
<b>TOTAL SCORE</b>		<b>100</b>	

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
<b>5</b>	<b>Demonstrates complete understanding of the problem. All requirements of task are included in response</b>
<b>4</b>	<b>Demonstrates considerable understanding of the problem. All requirements of task are included.</b>
<b>3</b>	<b>Demonstrates partial understanding of the problem. Most requirements of task are included.</b>
<b>2</b>	<b>Demonstrates little understanding of the problem. Many requirements of task are missing.</b>
<b>1</b>	<b>Demonstrates no understanding of the problem.</b>
<b>0</b>	<b>No response/task not attempted</b>

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.



<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

Source: Association of American Colleges and Universities

## 6. Date revised: 10/5/2022

*Ho Chi Minh City, dd/mm/yyyy*  
**Dean of School of Industrial Engineering and  
Management**

*(Signature)*



*Assoc. Prof. Dr. Nguyen Van Hop*

	<p>VIETNAM NATIONAL UNIVERSITY HCMC INTERNATIONAL UNIVERSITY School of Industrial Engineering and Management</p>
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### COURSE SYLLABUS

**Course Name: Advanced Logistics Systems and Supply Chain Management**

Course Code: xxxx

#### 1. General information

Course designation	<i>This course gives an in-depth review of the logistics and supply chain management in the industry. This course presents a framework for SCM that requires cross-functional integration of key business processes within the firm and across the network of firms that comprise the supply chain. This course approaches SCM from a managerial perspective and requires students to relate supply chain best practices to organizational performance. Students will apply theory and best practices from prerequisite courses across integrated supply chain decisions to implement a plan to achieve effective supply chain performance. This course is developed to provide students with the necessary knowledge, skills and foundations for acquiring a wide range of rewarding careers into the rapidly expanding world of Logistics Systems and Supply Chain Management.</i>
Semester(s) in which the course is taught	8
Person responsible for the course	Ngo Thi Thao Uyen Nguyen Hang Giang Anh
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project.

Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 Private study including examination preparation, specified in hours <sup>1</sup> : 30								
Credit points	4								
Required and recommended prerequisites for joining the course	Logistics and supply chain design.								
Course objectives	<i>Students will be provided with systematic advanced knowledge and skills of designing and operating logistics systems and managing the supply chain. The importance of supply chain decisions on an organization is justified. The impact supply chain decisions is investigated on various key performance indicators. The focus lies in understanding and applying modern analytical approaches, which are utilized in business practice by industrial, commercial, and logistics companies.</i>								
Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO1. Understand the key concepts and techniques that will allow students to analyze, manage and improve logistics systems and supply chain processes for different industries and markets. Assess supply chain performance and make recommendations to increase supply chain competitiveness.</td> </tr> <tr> <td>Skill</td> <td>CLO2. Work effectively in a group project of advanced logistics systems and supply chain management.</td> </tr> <tr> <td>Attitude</td> <td>CLO3. Have comprehensive and ethical concerns about social, economic and environmental aspects of logistics systems and supply chains.</td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1. Understand the key concepts and techniques that will allow students to analyze, manage and improve logistics systems and supply chain processes for different industries and markets. Assess supply chain performance and make recommendations to increase supply chain competitiveness.	Skill	CLO2. Work effectively in a group project of advanced logistics systems and supply chain management.	Attitude	CLO3. Have comprehensive and ethical concerns about social, economic and environmental aspects of logistics systems and supply chains.
Competency level	Course learning outcome (CLO)								
Knowledge	CLO1. Understand the key concepts and techniques that will allow students to analyze, manage and improve logistics systems and supply chain processes for different industries and markets. Assess supply chain performance and make recommendations to increase supply chain competitiveness.								
Skill	CLO2. Work effectively in a group project of advanced logistics systems and supply chain management.								
Attitude	CLO3. Have comprehensive and ethical concerns about social, economic and environmental aspects of logistics systems and supply chains.								

<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Content	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>			
	Weight: lecture and practice session			
	Teaching levels: I (Introduce); T (Teach); U (Utilize)			
	Topic	Content	Weight (hour)	Level
	Multi-Layer Multi-Product Supply Chain (Forward and Reverse SC models) Supply Chain Drivers and Metrics Case study: Seven-Eleven Japan Co.			I, T, U
	Planning and Forecasting in the Supply Chain Case Study: Specialty Packaging Corporation and Kloss Planters and Harvesters			I, T, U
	Sourcing Decisions in the Supply Chain Demand Management and Order Management Case Study: Alligatoor, Inc., and Trans-Changi, Inc; Tires For You			I, T, U
	Manufacturing – Supply Chain on the Make Case Study: Toyota and War Eagle Golf Ltd.			I, T, U
	Planning and Managing Inventory in the Supply Chain Case study: Steel Works, Inc., MAQ, Inc. And MoonChem			I, T, U
Designing the Supply chain Network - Omni-Channel Network Design Case study: Amazon, Blue Nile and Bigelow Stores			I, T, U	
Designing and Planning Distribution Networks Case study: Bob's Custom BBQs and Seleting Transporattion			I, T, U	

	modes for China imports			
	Review for midterm exam			U
	<i>Midterm exam</i>			
	Value of Information and Supply Chain Integration Case study: Barilla Spa, Reebok and the great inventory correction			I, T, U
	Strategic Alliances and Aligning Supply Chain – 3PLs Case study: Kimberly-Clark and Quick Chips, Inc.			I, T, U
	Customer Service and Risk Management Case study: Zara, FedEx and Nissan Motor Company			I, T, U
	Supply Chain Performance Measurement and Financial Analysis Pricing and Revenue Management Case study: To Savor or to Groupon? and Wash & Dry, Inc.			I, T, U
	LSCM Technology and Business Processes Global Supply Chain Network Case Study: Inflate-a Dome Innovations and Supply Chain Whirl Case study: BioPharma			I, T, U
	Sustainable, Resilient, Green LSCM and Corporate Social Responsibility Case Study: IKEA and H&M			U
	Group project presentation Review for final exam			U
	<i>Final Exam</i>			
Examination forms	Multiple-choice questions, Answer questions			

Study and examination requirements	Attendance: A minimum attendance of 70 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.  Assignments/Examination: Students must have more than 50/100 points overall to pass this course.
Reading list	[1] Langley, C. J., Novack, R. A., Gibson, B., and Coyle, J. J. (2020). Supply chain management: a logistics perspective. 11th Edition. Cengage Learning.  [2] Chopra, S. and Meindl, P. (2016). Supply chain management: strategy, planning, and operation. 6th Edition. Pearson Education.  [3] Fazlollahtabar, H. (2018). Supply Chain Management Models: Forward, Reverse, Uncertain, and Intelligent Foundations with Case Studies. CRC press.  [4] Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. (2021). Designing and managing the supply chain: Concepts, Strategies and Case studies. 4th Edition. McGraw-Hill Education  [5] Blanchard, D. (2021). Supply chain management best practices. 3rd Edition. John Wiley & Sons.

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Intended Learning Outcomes (ILO) (1-7) is shown in the following table:

	ILO						
CLO	1	2	3	4	5	6	7
1		x					x
2			x		x		
3				x			

Intended Learning Outcomes (*ABET\_Student Outcomes*)

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*
3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*

6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1a,b,c	1.2b	1.3c	2.1a,b		2.3a	2.4a,c	2.5a	
2	1.1c		1.3a,b						2.6a
3	1.1b		1.3c					2.5b	2.6b

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Multi-Layer Multi-Product Supply Chain (Foward and Reverse SC models) Supply Chain Drivers and Metrics Case study: Seven-Eleven Japan Co.	CLO 1, 2		Lecture presentation, in-class discussion	[2] Chapter 3 [3] Chapters 1&15
2	Planning and Forecasting in the Supply Chain Case Study: Specialty Packaging Corporation and Kloss Planters and Harvesters	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[5] Chapter 5 [2] Chapters 7&8
3	Sourcing Decisions in the Supply Chain Demand Management and Order Management Case Study: Alligatoor, Inc., and Trans-Changi, Inc; Tires For You	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[5] Chapter 6 [2] Chapter 15 [1] Chapter 5 [1] Chapter 7&8
4	Manufacturing – Supply Chain on the Make Case Study: Toyota and War Eagle Golf Ltd.	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[5] Chapter 6 [2] Chapter 6
5	Planning and Managing Inventory in the Supply Chain Case study: Steel Works, Inc., MAQ, Inc. And MoonChem	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[1] Chapter 9&11 [2] Chapters 11&13 [4] Chapter 2
6	Designing the Supply chain Network - Omni-Channel Network Design Case study: Amazon, Blue Nile and Bigelow Stores	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[1] Chapter 4 [2] Chapters 4, 5 &6 [4] Chapter 3
7	Designing and Planning Distribution Networks Case study: Bob's Custom	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[1] Chapter 11 [2] Chapter 14



	BBOs and Seleting Transporattion modes for China imports				
8	Review for midterm exam	CLO 2, 3		Project presentation, wrap-up	
	<i>Midterm exam</i>				
9	Value of Information and Supply Chain Integration Case study: Barilla Spa, Reebok and the great inventory correction	CLO 1, 2	Homework	Lecture presentation, in-class discussion	[2] Chapter 10 [4] Chapters 5&6
10	Strategic Alliances and Aligning Supply Chain – 3PLs Case study: Kimberly-Clark and Quick Chips, Inc.	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[5] Chapter 11 [4] Chapter 8 [1] Chapter 12
11	Customer Service and Risk Management Case study: Zara, FedEx and Nissan Motor Company	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[5] Chapter 12 [4] Chapter 12 [1] Chapter 8
12	Supply Chain Performance Measurement and Financial Analysis Pricing and Revenue Management Case study: To Savor or to Groupon? and Wash & Dry, Inc.	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[1] Chapter 13 [2] Chapter 16
13	LSCM Technology and Business Processes Global Supply Chain Network Case Study: Inflate-a Dome Innovations and Supply Chain Whirl Case study: BioPharma	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class discussion	[5] Chapter 13 [4] Chapter 16 [1] Chapter 14 [2] Chapter 6
14	Sustainable, Resilient, Green LSCM and Corporate Social	CLO 1, 2	Quiz/Homework	Lecture presentation, in-class	[5] Chapter 14 [4] Chapter 14

	Responsibility Case Study: IKEA and H&M			discussion	[1] Chapter 15
15	Group project presentation Review for final exam	CLO 2, 3		Project presentation, wrap-up	
<i>Final exam</i>					

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class attendance (5%)	Quiz 60% Pass	Quiz 60% Pass		
Group projects (20%) + Assignment 5%			Group project 80% Pass	
Midterm exam (30%)	50% Pass	50% Pass		50% Pass
Final exam (40%)	50% Pass	50% Pass		50% Pass

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		

Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
Presentation (20%)			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
Quality of Layout and Graphics (10%)	10		
TOTAL SCORE	100		

### 5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

Evidence <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/hypothesis).	Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

**Oral communication value rubric for evaluating presentation tasks:**

	Capstone	Milestone		Benchmark
	4	3	2	1
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.





## COURSE SYLLABUS

### Course Name: Capstone II

Course Code: IS108IU

#### 1. General information

<b>Course designation</b>	<p><i>Capstone Design II follows Capstone Design I and focuses on the advanced stages of the design project. It's about taking the initial concepts and turning them into a fully realized solution. Capstone Design II extends the work begun in Capstone Design I or improve a current system, concentrating on implementation, testing, and the final stages of systems. Students or teams will build upon their previous work, focusing on practical application or and the integration of their designs into existing systems.</i></p> <p><i>In the results, students typically present their completed projects, including the practical implementation, testing results, and documentation.</i></p>
<b>Semester(s) in which the course is taught</b>	<p style="text-align: center;">8</p>
<b>Person responsible for the course</b>	
<b>Language</b>	<p>English</p>
<b>Relation to curriculum</b>	<p>Compulsory</p>
<b>Teaching methods</b>	<p>Assignment, Project - Team: 2 students</p>

<b>Workload (incl. contact hours, self-study hours)</b>	<b>(Estimated) Total workload: 90</b> <b>Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 15</b> <b>Private study including examination preparation, specified in hours<sup>1</sup>: 75</b>
<b>Credit points</b>	<b>6</b>
<b>Required and recommended prerequisites for joining the course</b>	Capstone Design I
<b>Course objectives</b>	<p><i>By the end of the course, students should be able to:</i></p> <ol style="list-style-type: none"> <li><i>1. Improve a current system or implement the solutions developed in Capstone Design I.</i></li> <li><i>2. Validate the effectiveness of the solutions.</i></li> <li><i>3. Communicate the outcomes, implications, and recommendations of the project.</i></li> <li><i>4. Reflect on the entire design process, drawing lessons and insights.</i></li> <li><i>5. Exhibit high professionalism and effective teamwork</i></li> </ol>

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<sup>1</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<b>Course learning outcomes</b>	<b>Upon the successful completion of this course students will be able to:</b>	
	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>
		<b>CLO1.</b> <ul style="list-style-type: none"> <li>- Apply the theoretical knowledge acquired to real-world engineering or design challenges</li> <li>- Analyze and synthesize complex information, research findings, and data to develop effective solutions</li> </ul>
	<b>Skill</b>	<b>CLO2.</b> <ul style="list-style-type: none"> <li>- Solve problems and implement solutions by using equipment, software, and techniques</li> <li>- Plan and schedule project, resource allocation, and budgeting.</li> <li>- Convey project findings, write comprehensive reports, deliver clear and engaging presentations, and conflict resolution, and cooperation.</li> </ul>
<b>Attitude</b>	<b>CLO3</b> <ul style="list-style-type: none"> <li>- Adhering to ethical standards, maintaining a high level of integrity, and acting responsibly in the workplace.</li> <li>- Adaptability and flexibility in response to changing project conditions and requirements.</li> <li>- Continuous learning and improvement.</li> </ul>	



<b>Content</b>	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i>		
	<b>Weight: lecture and practice session</b>		
	<b>Teaching levels: I (Introduce); T (Teach); U (Utilize)</b>		
	<b>Topic</b>	<b>Weight (hour)</b>	<b>Level</b>
	<b>Project Recap and Refinement</b> <ul style="list-style-type: none"> <li>• Review of progress made in Capstone Design I.</li> <li>• Identify challenges and areas requiring further refinement.</li> </ul> <b>Define project goals and scope</b>	5	I, T, U
	<b>Implementation and Execution</b> <ul style="list-style-type: none"> <li>• Practical execution of the designed solutions, processes, or systems.</li> <li>• Tackling technical obstacles and unforeseen issues.</li> <li>• Collecting data and monitoring performance during implementation.</li> </ul>	20	T, U
	<b>Testing and Validation</b> <ul style="list-style-type: none"> <li>• Development of comprehensive testing protocols.</li> <li>• Analysis, and interpretation to measure solution effectiveness.</li> <li>• Comparison of outcomes with initial project objectives and specifications.</li> </ul>	20	T, U
	<b>Integration and System Compatibility</b> <ul style="list-style-type: none"> <li>• Integration of new solutions into existing systems or processes.</li> <li>• Testing of compatibility and interfaces.</li> </ul>	20	T, U
<b>Finalization and Documentation</b> <ul style="list-style-type: none"> <li>• Completion of technical reports and project documentation.</li> <li>• Compilation of findings, analysis, and conclusions.</li> <li>• Development of recommendations for projects</li> </ul>	20	T, U	
<b>Final Presentation</b>	5	U	

	<p><b>Preparation of the final presentation</b></p> <p><b>Reflection on the entire design process and challenges faced.</b></p> <p><b>Presentation for completed projects.</b></p>		
<b>Examination forms</b>	<p>Assessment:</p> <ul style="list-style-type: none"> <li>• Project implementation and execution: 25%</li> <li>• Testing and validation: 20%</li> <li>• Integration and system compatibility: 15%</li> <li>• Final documentation and recommendations: 20%</li> <li>• Final presentation and reflection: 20%</li> </ul>		
<b>Study and examination requirements</b>	<p>Attendance: A minimum attendance of 80 percent is compulsory for the weekly meetings. Students will be assessed on the basis of their working outputs.</p> <p>Examination: Students must have more than 50/100 points overall to pass this course</p>		
<b>Reading list</b>	<p><b>Textbooks:</b></p> <ul style="list-style-type: none"> <li>- Depending on specific problems</li> </ul> <p><b>References:</b></p> <p><b>Published scientific articles and technical documents</b></p>		

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-3) and Intended Learning Outcomes (ILO) (1 -7) is shown in the following table:

CLO	ILO						
	1	2	3	4	5	6	7
1	x			x			
2	x	x				x	x
3			x	x	x		

*Intended Learning Outcomes (ILO)*

*Criteria for Accrediting Engineering Programs, 2020-2021*

1. *an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics*
2. *an ability to apply engineering design to produce solutions that meet specified*

*needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors*

3. *an ability to communicate effectively with a range of audiences*
4. *an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts*
5. *an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives*
6. *an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions*
7. *an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.*

The relationship between Course Learning Outcomes (CLO) (1-3) and ASIIN learning outcomes is shown in the following table:

CLO	ASIIN learning outcomes								
	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6
1	1.1b	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	<b>2.2a</b>			2.5b, 2.6b	
2	<b>1.1a,1.1b,1.1c</b>	1.2a, 1.2b	1.3c, 1.3d	2.1a, 2.1b	2.2a, 2.2b	<b>2.3a</b>	2.4c		
3	1.1b,1.1c		1.3a, 1.3b,1.3c					2.5b	2.6a, 2.6b

### 3. Planned learning activities and teaching methods

It depends on the individual work between students and advisors, including main contents:

- Implementation: Turning the selected design concept into a practical solution.
- Testing and validation: Rigorous testing of the solution to ensure it meets project objectives.
- Iteration and refinement: Addressing challenges that arise during implementation, and refining the design as needed.
- Integration: If applicable, integrating the new solution into existing systems or processes.
- Documentation: Comprehensive documentation of the design process, testing results, and project outcomes.
- Final presentation: Presenting the completed project to committee.

### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
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Final Report (80%)	Final Report 60% Pass	Final Report 60% Pass	Final Report 60% Pass
Final Presentation (20%)	60% Pass	60% Pass	Final Presentation 60% Pass

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

## 1. Rubrics (optional)

### 5.1 Grading checklist

Grading checklist			
Student: .....		Topic: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
Chapter 1: Introduction (15%)			
Criterion 1: Problem statement	5		
Criterion 2: Objectives of Study	5		
Criterion 3: Scope and Limitations	5		
Chapter 2: Literature Review (15%)			
Criterion 1: Current System	2		
Criterion 2: Related Works	10		
Criterion 3: Research Gap(s) and Key Ref.	3		
Chapter 3: Proposed System (30%)			
Criterion 1: Methodology Selection	15		
Criterion 2: Proposed Solution	15		
Chapter 4: Implementation and Validation (30%)			
Criterion 1: Solution Implementation	15		
Criterion 2: Validation	15		
Chapter 4: Report and Presentation (10%)			
Criterion 1: Report	5		
Criterion 2: Presentation	5		
TOTAL SCORE		100	

### 5.2 Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW	
Score	Description
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.

1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

### 5.3 Analytic rubric

#### *Critical thinking value rubric for evaluating questions in exams:*

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

#### *Oral communication value rubric for evaluating presentation tasks:*

	Capstone	Milestone	Benchmark
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**PHỤ LỤC 3:**

**BẢNG MÔ TẢ SỐ TÍN CHỈ THỰC TẬP CỦA CTĐT ĐƯỢC  
THỂ HIỆN CỤ THỂ THEO MÔN HỌC ĐỂ ĐẢM BẢO 8TC THỰC TẬP  
THEO QUY ĐỊNH TẠI THÔNG TƯ 17/2021/TT-BGDĐT**

*(Kèm theo Quyết định số /QĐ-ĐHQT ngày tháng năm 2023  
của Hiệu trưởng trường Đại học Quốc tế)*

<b>Mã môn học</b>	<b>Tên môn học Tiếng Việt</b>	<b>Tên môn học Tiếng Anh</b>	<b>Loại môn học</b>	<b>Số tín chỉ</b>
IS052IU	Thực tập 1	Internship 1	Bắt buộc	2
IS053IU	Thực tập 2	Internship 2	Bắt buộc	3
IS111IU	Đồ án 1	Capstone 1	Bắt buộc	3
IS108IU	Đồ án 2	Capstone 2	Bắt buộc	6
<b>Tổng số tín chỉ</b>				<b>14</b>