CHƯỜNG TRÌNH ĐÀO TẠO KHÓA 2023 – NGÀNH KHOA HỌC MÁY TÍNH TRÌNH ĐỘ ĐẠI HỌC

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

TRÌNH ĐỘ ĐẠI HỌC

1. Thông tin chung

- Tên ngành đào tạo: Khoa học Máy tính
 - + Tiếng Việt: Khoa học Máy tính
 - + Tiếng Anh: Computer Science
- Mã ngành đào tạo: 7480101
- Trình độ đào tạo: Bậc Đại học, trình độ cử nhân
- Loại hình đào tạo: Chính quy
- Thời gian đào tạo: 4 năm
- Tên văn bằng sau khi tốt nghiệp:
 - + Tiếng Việt: Cử nhân Khoa học Máy tính
 - + Tiếng Anh: Bachelor of Science in Computer Science
- Nơi đào tạo: Trường Đại Học Quốc Tế Đại Học Quốc Gia TP.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 của Bộ Giáo dục và Đào tạo và Đề án tuyển sinh hàng năm của Đại học Quốc gia TP.HCM và Đề án tuyển sinh của trường Đại học Quốc tế.

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 TP.HCM và Đề án tuyển sinh của trường Đại học Quốc tế.

- c. Tổ hợp môn xét tuyển
- d. Dự kiến chỉ tiêu tuyển sinh, quy mô đào tạo

3. Mục tiêu đào tạo

a. Mục tiêu chung: đào tạo cử nhân Khoa học máy tính đạt được (i) nền tảng kiến thức cơ bản vững chắc về khoa học máy tính, (ii) kiến thức chuyên ngành sâu và rộng về khoa học máy tính và hệ thống thông tin, (iii) kiến thức về hội nhập, khởi nghiệp, (iv) các kỹ năng mềm cần thiết, (v) đạo đức nghề nghiệp và ý thức trách nhiệm đối với bản thân và xã hội, (vi) khả năng tự học hoặc tham gia các khóa bồi dưỡng để nắm bắt các công nghệ mới, và (vii) đủ năng lực học tiếp sau đại học trong và ngoài nước.

Bảng 1. Sự phù hợp của mục tiêu đào tạo với Tầm nhìn, sứ mạng và Mục tiêu giáo dục của Luật giáo dục đại học.

Mục tiêu đào tạo của CTĐT	Tầm nhìn	Sứ mạng (tô đậm những nội hàm mà mục tiêu thể hiện hoặc gắn kết)	Luật giáo dục (tô đậm những nội hàm mà mục tiêu thể hiện hoặc gắn kết)
 Sinh viên tốt nghiệp chương trình Cử nhân Kỹ thuật CNTT sẽ có: 1. Kiến thức và lý luận về ngành (i) kiến thức cơ bản vững chắc về máy tính, hệ thống máy tính, hệ thống máy tính, nạng máy tính và ứng dụng CNTT, bao gồm các khía cạnh lý thuyết và ứng dụng (ii) kiến thức chuyên ngành sâu, rộng về máy tính, hệ thống máy tính, hệ thống máy tính, mạng máy tính và ứng dụng công nghệ thông tin. Có kỹ năng phân tích và giải quyết vấn đề; thiết kế, phát triển và tích hợp hệ thống thông tin cho các ứng dụng kỹ thuật liên quan đến máy tính, hệ thống mạng máy tính. Khả năng giải quyết các vấn đề kỹ thuật, xã hội, chính 	 Nhằm mục đích trở thành trường được quốc gia và quốc tế công nhận về phương pháp giảng dạy tiên tiến, nghiên cứu hiện đại và đổi mới. Phương pháp giảng dạy tiên tiến: ✓ Để cung cấp cho sinh viên các lý thuyết cơ bản và nâng cao và liên kết chúng với ứng dụng kỹ thuật. ✓ Tương tác với học sinh cả trong và ngoài lớp học. ✓ Để hỗ trợ sinh viên với việc giảng dạy kết hợp. ✓ Để truyền cảm hứng cho sinh viên cảm phúng cho sinh viên cả trong tác với hộc sinh cả trong và ngoài lớp học. ✓ Để hỗ trợ sinh viên với việc giảng dạy kết hợp. ✓ Để truyền cảm hứng cho sinh viên tham gia nghiên cứu và giải quyết các vấn đề kỹ thuật. Nghiên cứu hiện đại phục vụ abo gia lữph vự cho sinh các phòng thí nghiệm hiện đại phục vụ 	 Phù hợp với sứ mệnh của IU – ĐHQG TP.HCM, SEE hướng đến: Giúp học sinh tận dụng tốt nhất các cơ hội học tập và chuẩn bị cho học sinh những kiến thức cần thiết để có thể thích ứng với sự thay đổi nhanh chóng của công nghệ Tiến hành nghiên cứu chất lượng cao mang lại lợi ích cho sinh viên, học giả và cộng đồng Chuyển giao công nghệ để giải quyết các vấn đề của cộng đồng và tạo ra sự hợp tác mạnh mẽ với Ngành. 	 Cung cấp giáo dục sau đại học và đại học chất lượng cao trong đa ngành. Tất cả các chương trình giáo dục đều được kiểm định/đánh giá theo tiêu chuẩn khu vực và quốc tế. Cung cấp các nghiên cứu xuất sắc bao gồm nghiên cứu co bản và ứng dụng đáp ứng nhu cầu của ngành, địa phương, xã hội và tiêu chuẩn quốc tế. Giữ vai trò tiên phong tại Việt Nam bằng cách thực hành quản lý xuất sắc, truyền cảm hứng và hỗ trợ các thành viên khác của ĐHQGHN trong việc thúc đẩy sự phát triển của Đại học Quốc gia TP.HCM nói chung.
	nghiên cứu của		

trị và kinh tế liên	trường và khuyến	
ngành.	khích sinh viên	
-	tham gia.	
2. Kỹ năng và		
phẩm chất cá nhân	✓ Để chuẩn bị	
và nghề nghiệp	chương trình giảng	
	day hoc thuất liên	
(iii) kiến thức về	quan đến nghiên	
hội nhập và khởi	cứu.	
nghiệp. Có ý thức		
bảo vệ môi trường,	 Đổi mới: 	
thiết kế và vận		
hành hệ thống thân	✓ Hướng dẫn học	
thiện với môi	sinh hiểu về bối	
trường.	cảnh xã hội, kinh tế	
	và kỹ thuật.	
3. Kỹ năng làm	······································	
việc nhóm và giao	🖌 Hướng học sinh	
tiếp	nhìn nhân vấn đề	
	hiện tại và tương	
(iv) các kỹ năng	lai.	
mêm cân thiết và		
giải quyêt vân đê.	✓ Rèn cho học sinh	
Có khả năng làm	tir duy sáng tạo và	
việc theo nhóm, kỹ	nhản biên	
năng lãnh đạo và	pilui orçii.	
quản lý. Có khả	✓ Rèn luvên cho	
năng giao tiêp và	học sinh làm việc	
làm việc chuyên	theo nhóm đối với	
nghiệp bằng tiếng	các bài toán tích	
Anh (ở mức độ	horn	
thành thạo).	nop.	
(v) Co y thức ro		
rang ve chuyen		
mon, dạo dực nghe		
nghiệp và tính thân		
trach nhiệm doi với 1°		
ban than va xa họi. $C_1 + \frac{1}{2}$		
co pnam chat		
cninn trị tot, song		
va iam việc tuân		
inu pnap luạt của		
nna nước việt		
Inalli.		

4. Năng lực hành nghề		
(vi) khả năng tự học và nghiên cứu hoặc tham gia các khóa bồi dưỡng để nắm bắt công nghệ mới,		
(vii) có đủ năng lực học tiếp trong và ngoài nước.		

b. Muc tiêu cụ thể (Program Objectives - POs)

Sinh viên tốt nghiệp phải có phẩm chất đạo đức, chính trị và sức khỏe tốt; có kiến thức cơ bản và chuyên sâu về Khoa học máy tính; có khả năng nghiên cứu, phân tích và thiết kế các hệ thống máy tính để giải quyết các vấn đề thực tế; có khả năng làm việc hiệu quả và sáng tạo trong quá trình làm việc; có khả năng tiếp tục học suốt đời để phát triển nghề nghiệp.

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

Kết quả của sinh viên dẫn đến mục tiêu Giáo dục của Chương trình một cách hợp lý. Việc đạt được các mục tiêu giáo dục của chương trình được hỗ trợ bởi các hành động của chương trình, được ánh xạ tới kết quả đầu ra của học sinh như trong Bảng:

Mục tiêu giáo dục của chương trình	1	2	3	4	5	6	7
PLO1	5	5	3	5	3	5	5
PLO 2	5	3	3	3	3	3	5
PLO 3			4	5	4	3	2
PLO 4			3	5	5		

5. Ma trận giữa mục tiêu đào tạo và chuẩn đầu ra

Bảng 2. Mối quan hệ giữa CĐR của CTĐT và mục tiêu đào tạo

Mục tiêu giáo dục của chương trình	PLOs	Kiến thức và sự hiểu biết	Phân tích kỹ thuật	Thiết kế kỹ thuật	Thực hành kỹ thuật và phát triển sản phẩm	Kỹ năng chuyển nhượng
Kiến thức	PLO 1	X	Х	Х	Х	

Kỹ năng	PLO 2		Х	Х
Tự chủ và trách nhiệm	PLO 3		Х	Х
	PLO 4			Х

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
Đạt				
Xuất sắc	90≤ ĐTBTL ≤ 100	$9,0 \le \text{DTBTL} \le 10$	4,0	\mathbf{A}^+
Giỏi	80≤ ĐTBTL < 90	8,0 ≤ ĐTBTL < 9,0	3,5	Α
Khá	70≤ ĐTBTL < 80	7,0≤ ĐTBTL < 8,0	3,0	B^+
Trung bình khá	60≤ ĐTBTL < 70	6,0≤ ĐTBTL < 7,0	2,5	В
Trung bình	50≤ ĐTBTL < 60	5,0≤ ĐTBTL < 6,0	2,0	С

Không đạt								
Yếu	40 ≤ ĐTBTL < 50	4,0≤ ĐTBTL < 5,0	1,5	D+				
Kém	30 ≤ ĐTBTL < 40	3,0≤ ĐTBTL < 4,0	1,0	D				
	ĐTBTL < 30	ĐTBTL < 3,0	0,0	F				

8. Khối lượng kiến thức toàn khoá

Tổng số tín chỉ: 130 tín chỉ, trong đó phân bổ kiến thức như Bảng 4 (không bao gồm giáo dục thể chất và giáo dục quốc phòng):

ТТ	C áo khối kiến thức $^{(3)}$	Khối lượng	Khối lượng			
11		Số tín chỉ	%			
Ι	Khối kiến thức giáo dục đại cương	45	35%			
II	Khối kiến thức cơ sở ngành	31	24%			
III	Kiến thức chuyên ngành	20	15%			
IV	Kiến thức tự chọn	15	12%			
V	Kiến thức bổ trợ	3	2%			
VI	Thực tập, khóa luận/luận văn tốt nghiệp	16	12%			
	Tổng cộng	130	100%			

Bảng 4. Cấu trúc chương trình đào tạo

9. Nội dung chương trình đào tạo

Bảng 5. Các môn học thuộc CTĐT

St Tên t MH	Tên MH	èn Mã H MH	Tên môn học (MH)		Loại MH (bắt buộc/ tự chọn)	Tín c	Tín chỉ		Phòng TN (**)
			Tiếng việt	Tiếng Anh		Tổ ng cộn g	Lý thuy ết	Thực hành/ Thí nghiệ m	

Ι		Kiến thứ	rc giáo dục đạ	ại cương					
1. 1	Các m	ôn lý luận	chính trị						
1	Triết học Mác- Lênin	PE015I U	Triết học Mác-Lênin	Philosophy Marx - Lenin	Bắt buộc	3	3	0	
2	Kinh tế chính trị Mác- Lênin	PE016I U	Kinh tế chính trị Mác-Lênin	Marxist – Leninist Political Economy	Bắt buộc	2	2	0	
3	Chủ nghĩa xã hội khoa học	PE017I U	Chủ nghĩa xã hội khoa học	Scientific Socialism	Bắt buộc	2	2	0	
4	Lịch sử Đảng Cộng Sản Việt Nam	PE018I U	Lịch sử Đảng Cộng Sản Việt Nam	History of Vietnamese Communist Party	Bắt buộc	2	2	0	
5	Tư tưởng Hồ Chí Minh	PE019I U	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	
		Tổng cộng				11	11	0	
1. 2	Khoa h	học tự nhi	ên – Xã hội						<u> </u>
6	Toán 1	MA001 IU	Toán 1	Calculus 1	Bắt buộc	4	4	0	
7	Toán 2	MA003 IU	Toán 2	Calculus 2	Bắt buộc	4	4	0	

8	Xác suất, thống kê và quá trình ngẫu nhiên	MA026 IU	Xác suất, thống kê và quá trình ngẫu nhiên	Probability, Statistic & Random Process	Bắt buộc	3	3	0	
9	Vật lý 1	PH013I U	Vật lý 1	Physics 1	Bắt buộc	2	2	0	
1 0	Vật lý 3	PH015I U	Vật lý 3	Physics 3	Bắt buộc	3	3	0	
1 1	Thực hành Vật lý 3	PH016I U	Thực hành Vật lý 3	Physics 3 Laboratory	Bắt buộc	1	0	1	
1 2	Đại số tuyến tính	IT154I U	Linear Algebra	Đại số tuyến tính	Bắt buộc	3	3	0	
1 3	Toán rời rạc	IT153I U	Toán rời rạc	Discrete Mathematic s	Bắt buộc	3	3	0	
1 4	Pháp luật đại cươn g	PE021I U	Pháp luật đại cương	General Law	Bắt buộc	3	3	0	
	Tổng c	cộng				26	25	1	
1. 3	Ngoại	ngữ							
1 5	Tiếng Anh chuy ên ngàn h 1 (kỹ năng nghe)	EN008 IU	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Academic English 1 (listening skill)	Bắt buộc	2	2	0	
1 6	Tiếng Anh chuy	EN007 IU	Tiếng Anh chuyên	Academic English 1	Bắt buộc	2	2	0	

	ên ngàn h 1 (kỹ năng viết)		ngành 1 (kỹ năng viết)	(writing skill)					
1 7	Tiếng Anh chuy ên ngàn h 2 (kỹ năng nói)	EN012 IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Academic English 2 (speaking skill)	Bắt buộc	2	2	0	
1 8	Tiếng Anh chuy ên ngàn h 2 (kỹ năng viết)	EN011 IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Academic English 2 (writing skill)	Bắt buộc	2	2	0	
	Tổng c	cộng				8	8	0	
1. 4	Giáo d	ục thể chỉ	ất						
	Giáo								
1 9	dục thể chất 1	PT001I U	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	0	3	
1 9 2 0	dục thể chất 1 Giáo dục thể chất 2	PT001I U PT002I U	Giáo dục thể chất 1 Giáo dục thể chất 2	Physical Training 1 Physical Training 2	Bắt buộc Bắt buộc	3	0	3	
1 9 2 0	dục thể chất 1 Giáo dục thể chất 2 Tổng c	PT001I U PT002I U ộng	Giáo dục thể chất 1 Giáo dục thể chất 2	Physical Training 1 Physical Training 2	Bắt buộc Bắt buộc	3 3 6	0 0 0	3 3 6	
1 9 2 0 II	dục thể chất 1 Giáo dục thể chất 2 Tổng c Kiến t	PT001I U PT002I U ộng hức cơ sở	Giáo dục thể chất 1 Giáo dục thể chất 2 ngành	Physical Training 1 Physical Training 2	Bắt buộc Bắt buộc	3 3 6	0 0 0	3 3 6	
1 9 2 0 II 2 1	dục thể chất 1 Giáo dục thể chất 2 Tổng c Kiến t Nhập môn Tin học	PT001I U PT002I U ông hức cơ sở IT064I U	Giáo dục thể chất 1 Giáo dục thể chất 2 ngành Nhập môn Tin học	Physical Training 1 Physical Training 2 Introduction to Computing	Bắt buộc Bắt buộc Bắt buộc	3 3 6 3	0 0 0 3	3 3 6 0	

	C/C+ +								
2 3	Lập trình hướn g đối tượng Cấu	IT069I U	Lập trình hướng đối tượng	Object- Oriented Programmin g	Bắt buộc	4	3	1	
2 4	trúc dữ liệu và giải thuật	IT013I U	Cấu trúc dữ liệu và giải thuật	Algorithms and Data Structures	Bắt buộc	4	3	1	
2 5	Nguy ên lý Quản trị Cơ sở dữ liệu	IT079I U	Nguyên lý Quản trị Cơ sở dữ liệu	Principles of Database Managemen t	Bắt buộc	4	3	1	
2 6	Kiến trúc máy tính	IT089I U	Kiến trúc máy tính	Computer Architecture	Bắt buộc	4	3	1	Môn học trước IT067 IU (3,0) Digita 1 Logic Desig n
2 7	Mạng máy tính	IT091I U	Mạng máy tính	Computer Networks	Bắt buộc	4	3	1	
2 8	Phân tích và thiết kế hướn g đối tượng	IT090I U	Phân tích và thiết kế hướng đối tượng	Object- Oriented Analysis and Design	Bắt buộc	4	3	1	
	Tống c	cộng			31	24	7		

II	Kiến thức chuyên ngành										
Ι					[I					
2 9	Công nghệ Phần mềm	IT076I U	Công nghệ Phần mềm	Software Engineering	Bắt buộc	4	3	1			
3 0	Phát triển ứng dụng Web	IT093I U	Phát triển ứng dụng Web	Web Application Developmen t	Bắt buộc	4	3	1			
3 1	Nguy ên lý của Ngôn ngữ lập trình	IT092I U	Nguyên lý của Ngôn ngữ lập trình	Principles of Programmin g Languages	Bắt buộc	4	3	1			
3 2	Hệ điều hành	IT017I U	Hệ điều hành	Operating Systems	Bắt buộc	4	3	1			
3 3	Trí thông minh nhân tao	IT159I U	Trí thông minh nhân tạo	Artificial Intelligence	Bắt buộc	4	3	1			
	Tổng c	çộng				20	15	5			
I V	Kiến tl	hức tự ch	ọn <i>(sinh viên</i>	chọn tối thiểu	15 tín c	hỉ troi	ng nhó	m môn h	ọc sau)		
3 4	Khai thác dữ liệu	IT160I U	Data Mining	Khai thác dữ liệu	Tự chọn	4	3	1			
3 5	Xử lý ånh Kỹ thuật số	IT130I U	Digital Image Processing	Xử lý ảnh Kỹ thuật số	Tự chọn	4	3	1			

3 6	Kiến trúc phần mềm	IT114I U	Software Architectur e	Kiến trúc phần mềm	Tự chọn	4	3	1	
3 7	Lập trình mạng	IT096I U	Net-centric Programmi ng	Lập trình mạng	Tự chọn	4	3	1	
3 8	Quản lý hệ thống thông tin	IT094I U	Informatio n System Manageme nt	Quản lý hệ thống thông tin	Tự chọn	4	3	1	
3 9	Quản lý dự án CNT T	IT056I U	IT Project Manageme nt	Quản lý dự án CNTT	Tự chọn	4	3	1	
4 0	Đồ hoạ Máy tính	IT024I U	Computer Graphics	Đồ hoạ Máy tính	Tự chọn	4	3	1	
4 1	Học sâu	IT157I U	Deep Learning	Học sâu	Tự chọn	4	3	1	
4 2	Inter net Vạn vật	IT134I U	Internet of Things	Internet Vạn vật	Tự chọn	4	3	1	
4 3	Phát triển ứng dụng di động	IT133I U	Mobile Application Developme nt	Phát triển ứng dụng di động	Tự chọn	4	3	1	
4	Tươn g tác người và máy	IT044I U	Human Computer Interaction	Tương tác người và máy	Tự chọn	4	3	1	

4 5	Điện toán đám mây	IT164I U	Cloud computing	Điện toán đám mây	Tự chọn	4	3	1	
4 6	Công nghệ và Triển khai bảo mật	IT165I U	Security Technolog y and Implement ation	Công nghệ và Triển khai bảo mật	Tự chọn	4	3	1	
4 7	Kiểm tra chất lượng phần mềm	IT166I U	Software Quality Verificatio n and Validation	Kiểm tra chất lượng phần mềm	Tự chọn	4	3	1	
4 8	Phát triển ứng dụng game	IT167I U	Game Application Developme nt	Phát triển ứng dụng game	Tự chọn	4	3	1	
4 9	Chuỗ i khối	IT150I U	Blockchain	Chuỗi khối	Tự chọn	4	3	1	
5 0	Phát triển và vận hành liên tục	IT156I U	Developme nt & Operation (DevOps)	Phát triển và vận hành liên tục	Tự chọn	4	3	1	
5 1	Trực quan hóa dữ liệu	IT138I U	Data Science and Visualizati on	Trực quan hóa dữ liệu	Tự chọn	4	3	1	
5 2	Tư Duy Phản Biện	PE008I U	Critical Thinking	Tư Duy Phản Biện	Tự chọn	3	3	0	

5 3	Tự chọn tự do		Free Elective	Tự chọn tự do		3	3	0	
	Tổng c	çộng				15	12	3	
V	Kiến t	hức bổ tro	ò,						
5 4	Khởi nghiệ p	IT120I U	Khởi nghiệp	Entrepreneu rship	Bắt buộc	3	3	0	
	Tổng c	cộng				3	3	0	
	Nghiêr	n cứu, thụ	rc tập và luận	văn tốt nghiệ	р				
5 5	Thực tập công nghiệ p	IT082I U	Thực tập công nghiệp	Internship	Bắt buộc	3	0	3	
5 6	Thực tập tốt nghiệ p	IT083I U	Thực tập tốt nghiệp	Special Study of the Field	Bắt buộc	3	0	3	
	Tổng c	çộng			6	0	6		
	Tốt ng	hiệp							
	Sinh vi	iên có GP	A >= 70: chọ	n môn Thesis					
5 7	Luận văn tốt nghiệ P	IT058I U	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	0	10	
	Tổng c	çộng				10	0	10	
	Sinh vi	iên có GP	A < 70: chọn	môn Thực tập	tốt ngh	iệp <mark>2</mark> v	và 2 mố	ôn tự <mark>ch</mark> ọ	on (sinh
	viên ch	nọn 2 môr	ı tự chọn ít n	hất 7 tín chỉ)					
5 8	Thực tập tốt nghiệ p 2	IT168I U	Thực tập tốt nghiệp 2	Special Study of the Field 2	Bắt buộc	3	3	0	
5 9	Khai thác	IT160I U	Khai thác dữ liệu	Data Mining	Tự chọn	4	3	1	

	dữ liệu								
6 0	Xử lý ảnh Kỹ thuật số	IT130I U	Xử lý ảnh Kỹ thuật số	Digital Image Processing	Tự chọn	4	3	1	
6 1	Kiến trúc phần mềm	IT114I U	Kiến trúc phần mềm	Software Architecture	Tự chọn	4	3	1	
6 2	Lập trình mạng	IT096I U	Lập trình mạng	Net-centric Programmin g	Tự chọn	4	3	1	
6 3	Quản lý hệ thống thông tin	IT094I U	Quản lý hệ thống thông tin	Information System Managemen t	Tự chọn	4	3	1	
6 4	Quản lý dự án CNT T	IT056I U	Quản lý dự án CNTT	IT Project Managemen t	Tự chọn	4	3	1	
6 5	Đồ hoạ Máy tính	IT024I U	Đồ hoạ Máy tính	Computer Graphics	Tự chọn	4	3	1	
6 6	Học sâu	IT157I U	Học sâu	Deep Learning	Tự chọn	4	3	1	
6 7	Inter net Vạn vật	IT134I U	Internet Vạn vật	Internet of Things	Tự chọn	4	3	1	
6 8	Phát triển ứng dụng	IT133I U	Phát triển ứng dụng di động	Mobile Application Developmen t	Tự chọn	4	3	1	

	di								
	động								
6 9	g tác người và máy	IT044I U	Tương tác người và máy	Human Computer Interaction	Tự chọn	4	3	1	
7 0	Điện toán đám mây	IT164I U	Điện toán đám mây	Cloud computing	Tự chọn	4	3	1	
7 1	Công nghệ và Triển khai bảo mật	IT165I U	Công nghệ và Triển khai bảo mật	Security Technology and Implementat ion	Tự chọn	4	3	1	
7 2	Kiểm tra chất lượng phần mềm	IT166I U	Kiểm tra chất lượng phần mềm	Software Quality Verification and Validation	Tự chọn	4	3	1	
7 3	Phát triển ứng dụng game	IT167I U	Phát triển ứng dụng game	Game Application Developmen t	Tự chọn	4	3	1	
7 4	Chuỗ i khối	IT150I U	Chuỗi khối	Blockchain	Tự chọn	4	3	1	
7 5	Phát triển và vận hành liên tục	IT156I U	Phát triển và vận hành liên tục	Developmen t & Operation (DevOps)	Tự chọn	4	3	1	
7 6	Trực quan	IT138I U	Trực quan hóa dữ liệu	Data Science and	Tự chọn	4	3	1	

hóa			Visualizatio				
dữ			n				
liệu							
Tổng cộng				10	9	1	
TÔNG	G SỐ TÍN	CHľ (không	bao gồm thể				
dục, giáo dục quốc phòng)			130	98	32		

10. Dự kiến kế hoạch giảng dạy (phân bổ các môn học theo từng học kỳ) 10.1. Trình độ AE1

Bảng 6. Kế hoạch giảng dạy đối với người học đạt trình độ AE1

		Tên MH			Tín ch	ĺ		Môn học tiên quyết
Học kỳ	Mã MH	Tiếng việt	Tiếng Anh	Loại MH (bắt buộc/t ự chọn)	Tổng cộng	Lý thuyết	Thực hành /Thí nghiệ m	(TQ)/ Môn học học trước (HT)/ Môn học song hành (SH)
	MA 001I U	Toán 1	Calculus 1	Bắt buộc	4	4	0	Không
	IT0 64I U	Nhập môn Tin học	Introduction to Computing	Bắt buộc	3	3	0	Không
I (tổn g số 17	EN0 08I U	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Listening AE1	Bắt buộc	2	2	0	Không
tin chỉ)	PH0 13I U	Vật lý 1	Physics 1	Bắt buộc	2	2	0	Không
	EN0 07I U	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Writing AE1	Bắt buộc	2	2	0	Không

	IT1 16I U	Lập trình C/C++	C/C++ Programmin g	Bắt buộc	4	3	1	Không
	Tổng				17	16	1	
	РН0 15I U	Vật lý 3	Physics 3	Bắt buộc	3	3	0	Môn học trước PH013IU Physics 1 và học song hành môn PH016IU Physics 3 Laborator y
	PH0 16I U	Thực hành Vật lý 3	Physics 3 Laboratory	Bắt buộc	1	0	1	Học song hành môn PH015IU Physics 3
II (tổn g số 19 tín chỉ)	EN0 12I U	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Speaking AE2	Bắt buộc	2	2	0	Môn học trước EN008IU Listening AE1 và EN007IU Writing AE1
chî)	EN0 11I U	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Writing AE2	Bắt buộc	2	2	0	Môn học trước EN008IU Listening AE1 và EN007IU Writing AE1
	IT0 69I U	Lập trình hướng đối tượng	Object- Oriented Programmin g	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programm ing hoặc IT149IU (3,1)

								Fundamen tals of
								Programm
								ing
								Môn học
								học trước
								(3.1)
								(3,1) C/C++
								Programm
								ing hoặc
								IT149IU
								(3,1)
	TT1 521	Toán rời	Discrete	Bắt	2	2	0	Fundamen
	531 11	rạc	Mathematics	buộc	3	3	0	tais oi Programm
	U							ing:
								IT154IU
								(3,0)
								Linear
								Algebra
								hoặc MA022III
								(4.0)
								Calculus 3
								Môn học
								học trước
								IT116IU
								(3,1)
	ITO							C/C++ Programm
	91I	Mạng	Computer	Băt	4	3	1	ing hoặc
	U	may tinh	Networks	buọc				IT149IU
								(3,1)
								Fundamen
								tals of Programm
								ing
	Tổng		I		19	16	3	
								Môn học
	MA			D ²				học trước
(tôn	003I	Toán 2	Calculus 2	Bat buôc	4	4	0	MA001IU
g so 20	U			Duộc				(4,0)
20								Calculus 1

tín chỉ)	IT1 54I U	Đại số tuyến tính	Linear Algebra	Bắt buộc	3	3	0	Môn học học trước MA003IU (4,0) Calculus 2
	IT0 13I U	ITO Cấu trúc Algorithms 13I dữ liệu và and Data U giải thuật Structures		Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programm ing
	IT0 79I U	Nguyên lý Quản trị Cơ sở dữ liệu	Principles of Database Managemen t	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programm ing hoặc IT149IU (3,1) Fundamen tals of Programm ing
	PE0 15I U	Triết học Mác- Lênin	Philosophy Marx - Lenin	Bắt buộc	3	3	0	Không
	PE0 16I U	Kinh tế chính trị Mác- Lênin	Marxist – Leninist Political Economy	Bắt buộc	2	2	0	Không
	Tổng				20	18	2	
IV (tổn	PT0 01I U	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	0	3	Không
g sô 19 tín chỉ, tron g đó sinh	IT0 89I U	Kiến trúc máy tính	Computer Architecture	Bắt buộc	4	3	1	Môn học học trước IT067IU (3,0) Digital Logic Design

viên chọ n 1 môn tự chọ n 4 tín	IT0 90I U	Phân tích và thiết kế hướng đối tượng	Object- Oriented Analysis and Design	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programm ing
chỉ)	ITO 93I U	Phát triển ứng dụng Web	Web Application Developmen t	Bắt buộc	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Managem ent và IT069IU (3,1) Object- Oriented Programm ing
	IT0 94I U	Quản lý hệ thống thông tin	Information System Managemen t	Tự chọn	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Managem ent
	IT0 56I U	Quản lý dự án CNTT	IT Project Managemen t	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programm ing
	ITO 24I U	Đồ hoạ Máy tính	Computer Graphics	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object-

							Oriented Programm ing
IT1 57I U	Học sâu	Deep Learning	Tự chọn	4	3	1	
IT1 34I U	Internet Vạn vật	Internet of Things	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 33I U	Phát triển ứng dụng di động	Mobile Application Developmen t	Tự chọn	4	3	1	Môn học học trước IT090IU (3,1) Object- Oriented Analysis and Design
IT0 44I U	Tương tác người và máy	Human Computer Interaction	Tự chọn	4	3	1	
IT1 64I U	Điện toán đám mây	Cloud computing	Tự chọn	4	3	1	
IT1 65I U	Công nghệ và Triển khai bảo mật	Security Technology and Implementat ion	Tự chọn	4	3	1	
IT1 66I U	Kiểm tra chất lượng phần mềm	Software Quality Verification and Validation	Tự chọn	4	3	1	
IT1 67I U	Phát triển ứng dụng game	Game Application Developmen t	Tự chọn	4	3	1	
IT1 50I U	Chuỗi khối	Blockchain	Tự chọn	4	3	1	

	IT1 56I U	1Phát triểnDevelopmen1và vậnt &Ihành liênOperationtuc(DevOps)		Tự chọn	4	3	1	
	IT1 38I U	Trực quan hóa dữ liệu	Data Science and Visualizatio n	Tự chọn	4	3	1	
	PE0 08I U	Tư Duy Phản Biện	Critical Thinking	Tự chọn	3	3	0	
	Tổng			19	12	7		
PT0 02I U		Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3	0	3	Không
V (tổn g số 20 tín	MA 026I U	Xác suất, thống kê và quá trình ngẫu nhiên	Probability, Statistic & Random Process	Bắt buộc	3	3	0	Môn học trước MA001IU Calculus 1 and MA003IU Calculus 2
tin chỉ, tron g đó sinh viên chọ n 2 môn	PE0 17I U	Chủ nghĩa xã hội khoa học	Scientific Socialism	Bắt buộc	2	2	0	Môn học trước PE016IU (2,0) Marxist – Leninist Political Economy
môn tự chọ n 8 tín chỉ)	IT0 92I U	Nguyên lý của Ngôn ngữ lập trình	Principles of Programmin g Languages	Bắt buộc	4	3	1	
	IT1 60I U	Khai thác dữ liệu	Data Mining	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object- Oriented Programm ing

	IT1 30I U Xử lý ảnh Image Processing		Tự chọn	4	3	1		
	IT1 14I U	Kiến trúc phần mềm	Software Architecture	Tự chọn	4	3	1	
	IT0 96I U	Lập trình mạng	Net-centric Programmin g	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
	Tổng				20	14	6	
VI (tổn g số 19 tín chỉ, tron g đó sinh viên chọ n 1 môn tự chọ n tự do 3 tín chỉ)	IT0 76I U	Công nghệ Phần mềm	Software Engineering	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programm ing
	IT1 59I U	Trí thông minh nhân tạo	Artificial Intelligence	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programm ing và IT153IU (3,0) Discrete Mathemat ics
	PE0 21I U	Pháp luật đại cương	General law	Bắt buộc	3	3	0	Không
	PE0 18I U	Lịch sử Đảng Cộng Sản Việt Nam	History of Vietnamese Communist Party	Bắt buộc	2	2	0	Môn học trước PE017IU (2,0) Scientific Socialism

		Tự chọn tự do	Free elective	Tự chọn	3	3	0	Không									
	IT1 20I U	Khởi nghiệp	Entrepreneu rship	Bắt buộc	3	3	0	Không									
	Tổng				19	17	2										
VII- học kỳ hè	ITO 82I U	Thực tập công nghiệp	Internship	Bắt buộc	3	0	3										
(tôn g số 3 tín chỉ)	Tổng				3	0	3	3									
VIII (tổn g số 13 tín chỉ)	ITO 17I U	Hệ điều hành	Operating Systems	Bắt buộc	4	3	1	Môn học học trước IT089IU (3,1) Computer Architectu re và IT013IU (3,1) Algorithm s and Data Structure									
	РЕ0 19І U	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0	Môn học trước PE018IU (2,0) History of Vietnames e Communi st Party									
	ITO 83I U	IT0 83IThực tập tốt nghiệpSpecial Study of the FieldBắt buộc				0	3	Không									
	Tổng		9	5	4												
	Sinh	viên có GPA	A >= 70: chọn	môn The	sis		Sinh viên có GPA >= 70: chọn môn Thesis										

IX (tổn g số	IT0 58I U	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	0	10			
10 or	Tổng	cộng			10	0	10			
01 11 tín	Sinh (sinh	viên có GPA viên chọn 2	A < 70: chọn m môn tự chọn t	iôn Thực ít nhất 7 t	c tập tốt nghiệp 2 và 2 môn tự chọn ' tín chỉ)					
chỉ)	IT1 68I U	Thực tập tốt nghiệp 2	Special Study of the Field 2	Bắt buộc	3	0	3	Môn học trước IT083IU Special Study of the Field (3,0)		
	IT1 60I U	Khai thác dữ liệu	Data Mining	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object- Oriented Programm ing		
	IT1 30I U	Xử lý ảnh Kỹ thuật số	Digital Image Processing	Tự chọn	4	3	1			
	IT1 14I U	Kiến trúc phần mềm	Software Architecture	Tự chọn	4	3	1			
	IT0 96I U	Lập trình mạng	Net-centric Programmin g	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks		
	ITO 94I U	Quản lý hệ thống thông tin	Information System Managemen t	Tự chọn	4	3	1			
	ITO 56I U	Quản lý dự án CNTT	IT Project Managemen t	Tự chọn	4	3	1			
	IT0 24I U	Đồ hoạ Máy tính	Computer Graphics	Tự chọn	4	3	1			

IT1 57I U	Học sâu	Deep Learning	Tự chọn	4	3	1	
IT1 34I U	Internet Vạn vật	Internet of Things	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 33I U	Phát triển ứng dụng di động	Mobile Application Developmen t	Tự chọn	4	3	1	
IT0 44I U	Tương tác người và máy	Human Computer Interaction	Tự chọn	4	3	1	
IT1 64I U	Điện toán đám mây	Cloud computing	Tự chọn	4	3	1	
IT1 65I U	Công nghệ và Triển khai bảo mật	Security Technology and Implementat ion	Tự chọn	4	3	1	
IT1 66I U	Kiểm tra chất lượng phần mềm	Software Quality Verification and Validation	Tự chọn	4	3	1	
IT1 67I U	Phát triển ứng dụng game	Game Application Developmen t	Tự chọn	4	3	1	
IT1 50I U	Chuỗi khối	Blockchain	Tự chọn	4	3	1	
IT1 56I U	Phát triển và vận hành liên tục	Developmen t & Operation (DevOps)	Tự chọn	4	3	1	
IT1 38I U	Trực quan hóa dữ liệu	Data Science and Visualizatio n	Tự chọn	4	3	1	

Tổng cộng	10	9	1	
Tổng	136	98	38	

10.2. Trình độ IE2

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

	-	Tên MH	I	Loại	Tín chỉ	l		Môn học tiên
Học kỳ	Mã MH	Tiếng việt	Tiến g Anh	MH (bắt buộc/t ự chọn)	Tổng cộng	Lý thuyế t	Thực hành/Th í nghiệm	duyet (TQ)/ Môn học học trước (HT)/ Môn học song hành (SH)
I (tổn g số 17 tín	EN TP0 2	Tiếng Anh Tăng Cường 2	Inten sive Engli sh 2	Bắt buộc	17	17	0	Không
chỉ)	Tổng				17	17	0	
II (tổn g số 17 tín chỉ)	MA 001I U	Toán 1	Calcu lus 1	Bắt buộc	4	4	0	Không
	IT0 64I U	Nhập môn Tin học	Intro ducti on to Com putin g	Bắt buộc	3	3	0	Không
	EN0 08I U	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Liste ning AE1	Bắt buộc	2	2	0	Không
	PH0 13I U	Vật lý 1	Physi cs 1	Bắt buộc	2	2	0	Không

	EN0 07I U	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Writi ng AE1	Bắt buộc	2	2	0	Không
	IT1 16I U	Lập trình C/C++	C/C+ + Progr ammi ng	Bắt buộc	4	3	1	Không
	Tống				17	16	1	
	PH0 15I U	Vật lý 3	Physi cs 3	Bắt buộc	3	3	0	Môn học trước PH013IU Physics 1 và học song hành môn PH016IU Physics 3 Laboratory
III	PH0 16I U	Thực hành Vật lý 3	Physi cs 3 Labor atory	Bắt buộc	1	0	1	Học song hành môn PH015IU Physics 3
(tổn g số 19 tín chỉ)	EN0 12I U	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Spea king AE2	Bắt buộc	2	2	0	Không
	EN0 11I U	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Writi ng AE2	Bắt buộc	2	2	0	Không

	IT0 691 U	Lập trình hướng đối tượng	Objec t- Orien ted Progr ammi ng	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
	IT1 53I U	Toán rời rạc	Discr ete Math emati cs	Bắt buộc	3	3	0	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming; IT154IU (3,0) Linear Algebra hoặc MA023IU (4,0) Calculus 3
	ITO 91I U	Mạng máy tính	Com puter Netw orks	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
	Tổng		1	I	19	16	3	
	MA 003I U	Toán 2	Calcu lus 2	Bắt buộc	4	4	0	Môn học học trước MA001IU (4,0) Calculus 1
IV (tổn g số 20 tín chỉ)	IT1 54I U	Đại số tuyến tính	Linea r Alge bra	Bắt buộc	3	3	0	Không
	IT0 13I U	Cấu trúc dữ liệu và giải thuật	Algor ithms and Data	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming

			Struct ures					
	IT0 79I U	Nguyê n lý Quản trị Cơ sở dữ liệu	Princi ples of Datab ase Mana geme nt	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
	PE0 15I U	Triết học Mác- Lênin	Philo sophy Marx - Lenin	Bắt buộc	3	3	0	Không
	PE0 16I U	Kinh tế chính trị Mác- Lênin	Marx ist – Lenin ist Politi cal Econ omy	Bắt buộc	2	2	0	Không
	Tổng				20	18	2	
V (tổn g số 19 tín chỉ, tron g đó sinh viên chọ n 1 mô n tự chọ	PT0 01I U	Giáo dục thể chất 1	Physi cal Train ing 1	Bắt buộc	3	0	3	Không
	IT0 89I U	Kiến trúc máy tính	Com puter Archi tectur e	Bắt buộc	4	3	1	Không
	IT0 90I U	Phân tích và thiết kế hướng đối tượng	Objec t- Orien ted Anal vsis	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming

n 4 tín chỉ)			and Desig n					
	IT0 93I U	Phát triển ứng dụng Web	Web Appli catio n Devel opme nt	Bắt buộc	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management và IT069IU (3,1) Object-Oriented Programming
	IT0 94I U	Quản lý hệ thống thông tin	Infor matio n Syste m Mana geme nt	Tự chọn	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management
	IT0 56I U	Quản lý dự án CNTT	IT Proje ct Mana geme nt	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	IT0 24I U	Đồ hoạ Máy tính	Com puter Grap hics	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	IT1 57I U	Học sâu	Deep Learn ing	Tự chọn	4	3	1	
	IT1 34I U	Interne t Vạn vật	Intern et of Thing s	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
	IT1 33I U	Phát triển ứng	Mobi le Appli	Tự chọn	4	3	1	Môn học học trước IT090IU (3,1) Object-

	dụng di động	catio n Devel opme nt					Oriented Analysis and Design
IT0 44I U	Tương tác người và máy	Hum an Com puter Intera ction	Tự chọn	4	3	1	
IT1 64I U	Điện toán đám mây	Clou d comp uting	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 65I U	Công nghệ và Triển khai bảo mật	Secur ity Tech nolog y and Imple ment ation	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 66I U	Kiểm tra chất lượng phần mềm	Softw are Quali ty Verifi catio n and Valid ation	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 67I U	Phát triển ứng dụng game	Game Appli catio n Devel opme nt	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming

	IT1 50I U	Chuỗi khối	Block chain	Tự chọn	4	3	1	
	IT1 56I U	Phát triển và vận hành liên tục	Devel opme nt & Oper ation (Dev Ops)	Tự chọn	4	3	1	
	IT1 38I U	Trực quan hóa dữ liệu	Data Scien ce and Visua lizati on	Tự chọn	4	3	1	
	PE0 08I U	Tư Duy Phản Biện	Critic al Think ing	Tự chọn	3	3	0	
	Tổng				19	12	7	
VI (tổn g số 20 tín chỉ, tron g đó sinh viên chộ n 2 mô n tự chộ n 8	PT0 02I U	Giáo dục thể chất 2	Physi cal Train ing 2	Bắt buộc	3	0	3	Không
	MA 026I U	Xác suất, thống kê và quá trình ngẫu nhiên	Proba bility, Statis tic & Rand om Proce ss	Bắt buộc	3	3	0	Môn học trước MA001IUCalcul us 1 and MA003IU Calculus 2
	PE0 17I U	Chủ nghĩa xã hội	Scien tific Socia lism	Bắt buộc	2	2	0	Môn học trước PE016IU (2,0) Marxist –

tín		khoa						Leninist Political
chỉ)		học						Economy
	IT0 92I U	Nguyê n lý của Ngôn ngữ lập trình	Princi ples of Progr ammi ng Lang uages	Bắt buộc	4	3	1	
	IT1 60I U	Khai thác dữ liệu	Data Mini ng	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object-Oriented Programming
	IT1 30I U	Xử lý ảnh Kỹ thuật số	Digit al Imag e Proce ssing	Tự chọn	4	3	1	
	IT1 14I U	Kiến trúc phần mềm	Softw are Archi tectur e	Tự chọn	4	3	1	
	IT0 96I U	Lập trình mạng	Net- centri c Progr ammi ng	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
	Tổng				20	14	6	
VII I (tổn g số 19	IT0 76I U	Công nghệ Phần mềm	Softw are Engin eerin g	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming

tín chỉ, tron g đó sinh viên chọ n 1	IT1 59I U	Trí thông minh nhân tạo	Artifi cial Intelli gence	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming và IT153IU (3,0) Discrete Mathematics		
mô n tự chọ	PE0 21I U	Pháp luật đại cương	Gene ral law	Bắt buộc	3	3	0	Không		
n tự do 3 tín chỉ)	PE0 18I U	Lịch sử Đảng Cộng Sản Việt Nam	Histo ry of Vietn ames e Com muni st Party	Bắt buộc	2	2	0	Môn học trước PE017IU (2,0) Scientific Socialism		
		Tự chọn tự do	Free electi ve	Tự chọn	3	3	0	Không		
	IT1 20I U	Khởi nghiệp	Entre prene urshi p	Bắt buộc	3	3	0	Không		
	Tổng				19	17	2			
IX (tổn g số 13	ITO 17I U	Hệ điều hành	Oper ating Syste ms	Bắt buộc	4	3	1	Môn học học trước IT089IU (3,1) Computer Architecture và IT013IU (3,1) Algorithms and Data Structure		
13 tín chỉ)	PE0 19I U	Tư tưởng Hồ Chí Minh	Ho Chi Minh' s	Bắt buộc	2	2	0	Môn học trước PE018IU (2,0) History of Vietnamese Communist Party		
			Thou ghts							
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	ITO 83I U	Thực tập tốt nghiệp	Speci al Study of the Field	Bắt buộc	3	0	3	Không		
	Tổng				9	5	4			
X- học kỳ hè	IT0 82I U	Thực tập công nghiệp	Intern ship	Bắt buộc	3	0	3	Không		
(tổn g số 3 tín chỉ)	Tổng				3	0	3			
	Sinh	viên có G	PA >= '	70: chọn	môn Th	esis				
	IT0 58I U	Luận văn tốt nghiệp	Thesi s	Bắt buộc	10	0	10	Môn học trước IT083IU Special Study of the Field (3,0)		
	Tổng	cộng		1	10	0	10			
XI	Sinh viên có GPA < 70: chọn môn Thực tập tốt nghiệp 2 và 2 môn tự chọn (sinh viên chon 2 môn tư chon ít nhất 7 tín chỉ)									
(tổn g số 10 or 11 tín chỉ)	IT1 68I U	Thực tập tốt nghiệp 2	Speci al Study of the Field 2	Bắt buộc	3	0	3	Môn học trước IT083IU Special Study of the Field (3,0)		
	IT1 60I U	Khai thác dữ liệu	Data Mini ng	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object-Oriented Programming		
	IT1 30I U	Xử lý ảnh Kỹ thuật số	Digit al Imag e	Tự chọn	4	3	1			

		Proce ssing					
IT1 14I U	Kiến trúc phần mềm	Softw are Archi tectur e	Tự chọn	4	3	1	
IT0 96I U	Lập trình mạng	Net- centri c Progr ammi ng	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT0 94I U	Quản lý hệ thống thông tin	Infor matio n Syste m Mana geme nt	Tự chọn	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management
IT0 56I U	Quản lý dự án CNTT	IT Proje ct Mana geme nt	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
ITO 24I U	Đồ hoạ Máy tính	Com puter Grap hics	Tự chọn	4	3	1	
IT1 57I U	Học sâu	Deep Learn ing	Tự chọn	4	3	1	
IT1 34I U	Interne t Vạn vật	Intern et of Thing s	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks

IT1 33I U	Phát triển ứng dụng di động	Mobi le Appli catio n Devel opme nt	Tự chọn	4	3	1	Môn học học trước IT090IU (3,1) Object- Oriented Analysis and Design
IT0 44I U	Tương tác người và máy	Hum an Com puter Intera ction	Tự chọn	4	3	1	
IT1 64I U	Điện toán đám mây	Clou d comp uting	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 65I U	Công nghệ và Triển khai bảo mật	Secur ity Tech nolog y and Imple ment ation	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 66I U	Kiểm tra chất lượng phần mềm	Softw are Quali ty Verifi catio n and Valid ation	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 67I U	Phát triển ứng dụng game	Game Appli catio n Devel	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming

		opme nt					
IT1 50I U	Chuỗi khối	Block chain	Tự chọn	4	3	1	
IT1 56I U	Phát triển và vận hành liên tục	Devel opme nt & Oper ation (Dev Ops)	Tự chọn	4	3	1	
IT1 38I U	Trực quan hóa dữ liệu	Data Scien ce and Visua lizati on	Tự chọn	4	3	1	
Tổng	cộng			10	9	1	
Tổng				153	115	38	

10.3. Trình độ IE1 Bảng 8. Kế hoạch giảng dạy đối với người học đạt trình độ IE1

Học kỳ	Mã MH	Tên MH		Loại	Tín ch	ľ	Môn học tiên	
		Tiếng việt	Tiếng Anh	(bắt buộc/ tự chọn)	Tổng cộng	Lý thuyết	Thực hành/Thí nghiệm	Môn học học trước (HT)/ Môn học song hành (SH)
I (tổn g số	EN TP0 1	Tiếng Anh Tăng Cường 1	Intensi ve Englis h 1	Bắt buộc	17	17	0	Không
17 tín chỉ)	EN TP0 2	Tiếng Anh Tăng	Intensi ve Englis h 2	Bắt buộc	17	17	0	Môn học trước Tiếng Anh Tăng Cường 1

		Cường 2						
	Tổng	2			34	34	0	
	MA 001I U	Toán 1	Calcul us 1	Bắt buộc	4	4	0	Không
II (tổn g số	ITO 64I U	Nhập môn Tin học	Introdu ction to Compu ting	Bắt buộc	3	3	0	Không
	EN0 08I U	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Listeni ng AE1	Bắt buộc	2	2	0	Không
17 tín chỉ)	PH0 13I U	Vật lý 1	Physic s 1	Bắt buộc	2	2	0	Không
ciii)	EN0 07I U	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Writin g AE1	Bắt buộc	2	2	0	Không
	IT1 16I U	Lập trình C/C++	C/C++ Progra mming	Bắt buộc	4	3	1	Không
	Tổng				17	16	1	
III (tổn g số 19 tín chỉ)	PH0 15I U	Vật lý 3	Physic s 3	Bắt buộc	3	3	0	Môn học trước PH013IU Physics 1 và học song hành môn PH016IU Physics 3 Laboratory

PH0 16I U	Thực hành Vật lý 3	Physic s 3 Labora tory	Bắt buộc	1	0	1	Học song hành môn PH015IU Physics 3
EN0 12I U	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Speaki ng AE2	Bắt buộc	2	2	0	Môn học trước EN008IU Listening AE1 và EN007IU Writing AE1
EN0 11I U	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Writin g AE2	Bắt buộc	2	2	0	Môn học trước EN008IU Listening AE1 và EN007IU Writing AE1
IT0 69I U	Lập trình hướng đối tượng	Object - Orient ed Progra mming	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
IT1 53I U	Toán rời rạc	Discret e Mathe matics	Bắt buộc	3	3	0	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming; IT154IU (3,0) Linear Algebra hoặc MA023IU (4,0) Calculus 3

	ITO 91I U Tổng	Mạng máy tính	Compu ter Netwo rks	Bắt buộc	4	3	1 3	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
	MA 003I U	Toán 2	Calcul us 2	Bắt buộc	4	4	0	Môn học học trước MA001IU (4,0) Calculus 1
	IT1 54I U	Đại số tuyến tính	Linear Algebr a	Bắt buộc	3	3	0	Không
IV (tổn g số 20 tín chỉ)	IT0 13I U	Cấu trúc dữ liệu và giải thuật	Algorit hms and Data Structu res	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	ITO 79I U	Nguyê n lý Quản trị Cơ sở dữ liệu	Princip les of Databa se Manag ement	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
	PE0 15I U	Triết học Mác- Lênin	Philos ophy Marx - Lenin	Bắt buộc	3	3	0	Không

	PE0 16I U	Kinh tế chính trị Mác- Lênin	Marxis t – Lenini st Politic al Econo my	Bắt buộc	2	2	0	Không
	Tổng				20	18	2	
	PT0 01I U	Giáo dục thể chất 1	Physic al Trainin g 1	Bắt buộc	3	0	3	Không
V (tổn g số 19 tín chỉ, tron g đó sinh viên chọ n 1 môn tự chọ n 4 tín chỉ)	IT0 891 U	Kiến trúc máy tính	Compu ter Archit ecture	Bắt buộc	4	3	1	Không
	IT0 94I U	Quản lý hệ thống thông tin	Inform ation System Manag ement	Tự chọn	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management
	IT0 56I U	Quản lý dự án CNTT	IT Project Manag ement	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	IT0 24I U	Đồ hoạ Máy tính	Compu ter Graphi cs	Tự chọn	Tự chọn	4	3	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	IT1 57I U	Học sâu	Deep Learni ng	Tự chọn	4	3	1	
	IT1 34I U	Interne t Vạn vật	Interne t of Things	Tự chọn	4	3	1	Môn học học trước IT091IU

							(3,1) Computer Networks
IT1 33I U	Phát triển ứng dụng di động	Mobile Applic ation Develo pment	Tự chọn	4	3	1	Môn học học trước IT090IU (3,1) Object- Oriented Analysis and Design
IT0 44I U	Tương tác người và máy	Human Compu ter Interac tion	Tự chọn	4	3	1	
IT1 64I U	Điện toán đám mây	Cloud compu ting	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 65I U	Công nghệ và Triển khai bảo mật	Securit y Techn ology and Imple mentat ion	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 66I U	Kiểm tra chất lượng phần mềm	Softwa re Qualit y Verific ation and Validat ion	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 67I U	Phát triển ứng dụng game	Game Applic ation Develo pment	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming

	IT1 50I U	Chuỗi khối	Blockc hain	Tự chọn	4	3	1	
	IT1 56I U	Phát triển và vận hành liên tục	Develo pment & Operat ion (DevO ps)	Tự chọn	4	3	1	
	IT1 38I U	Trực quan hóa dữ liệu	Data Scienc e and Visuali zation	Tự chọn	4	3	1	
	PE0 08I U	Tư Duy Phản Biện	Critica 1 Thinki ng	Tự chọn	3	3	0	
	IT0 90I U	Phân tích và thiết kế hướng đối tượng	Object - Orient ed Analys is and Design	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	IT0 93I U	Phát triển ứng dụng Web	Web Applic ation Develo pment	Bắt buộc	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management và IT069IU (3,1) Object- Oriented Programming
	Tổng				19	12	7	
VI	PT0 02I U	Giáo dục thể chất 2	Physic al	Bắt buộc	3	0	3	Không

(ton g số 20 tín chỉ, tron g đó sinh viên chọ n 2 môn tự chọ n 8 tín chỉ)	MA 026I U	Xác suất, thống kê và quá trình ngẫu nhiên	Trainin g 2 Probab ility, Statisti c & Rando m Proces s	Bắt buộc	3	3	0	Môn học trước MA001IUCalc ulus 1 and MA003IU Calculus 2
	PE0 17I U	Chủ nghĩa xã hội khoa học	Scienti fic Sociali sm	Bắt buộc	2	2	0	Môn học trước PE016IU (2,0) Marxist – Leninist Political Economy
	IT0 92I U	Nguyê n lý của Ngôn ngữ lập trình	Princip les of Progra mming Langu ages	Bắt buộc	4	3	1	
	IT1 60I U	Khai thác dữ liệu	Data Mining	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object- Oriented Programming
	IT1 30I U	Xử lý ånh Kỹ thuật số	Digital Image Proces sing	Tự chọn	4	3	1	
	IT1 14I U	Kiến trúc phần mềm	Softwa re Archit ecture	Tự chọn	4	3	1	
	IT0 96I U	Lập trình mạng	Net- centric	Tự chọn	4	3	1	Môn học học trước IT091IU

			Progra mming					(3,1) Computer Networks
	Tổng				20	14	6	
VII (tổn g số 19 tín chỉ, tron g đó sinh viên chọ n 1 môn tự chọ n tự do 3	IT0 76I U	Công nghệ Phần mềm	Softwa re Engine ering	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	IT1 59I U	Trí thông minh nhân tạo	Artifici al Intellig ence	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming và IT153IU (3,0) Discrete Mathematics
	PE0 21I U	Pháp luật đại cương	Genera 1 law	Bắt buộc	3	3	0	Không
	PE0 18I U	Lịch sử Đảng Cộng Sản Việt Nam	Histor y of Vietna mese Comm unist Party	Bắt buộc	2	2	0	Môn học trước PE017IU (2,0) Scientific Socialism
tin chỉ)		Tự chọn tự do	Free electiv e	Tự chọn	3	3	0	Không
	IT1 20I U	Khởi nghiệp	Entrep reneurs hip	Bắt buộc	3	3	0	Không
	Tổng				19	17	2	
VIII (tổn g số 13	IT0 17I U	Hệ điều hành	Operat ing System s		4	3	1	Môn học học trước IT089IU (3,1) Computer Architecture và IT013IU (3,1) Algorithms and

tín								Data Structure		
chỉ)	PE0 19I U	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thoug hts		2	2	0	Môn học trước PE018IU (2,0) History of Vietnamese Communist Party		
	IT0 83I U	Thực tập tốt nghiệp	Special Study of the Field		3	0	3	Không		
	Tổng				9	5	4			
IX- học kỳ hè	ITO 82I U	Thực tập công nghiệp	Interns hip	Bắt buộc	3	0	3	Không		
(tổn g số 3 tín chỉ)	Tổng				3	0	3			
	Sinh	Sinh viên có GPA >= 70: chọn môn Thesis								
X	IT0 58I U	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	0	10	Môn học trước IT083IU Special Study of the Field (3,0)		
(tôn g số	Tổng	cộng			10	0	10			
10 or	Sinh (sinh	viên có G viên chọi	GPA < 70: n 2 môn t	: chọn n tự chọn	nôn Thụ ít nhất 7	rc tập tốt ′ tín chỉ)	nghiệp 2 và	a 2 môn tự chọn		
11 tín chỉ)	Thự c tập tốt nghi ệp 2	IT168I U	Special Study of the Field 2	Bắt buộc	3	0	3	Môn học trước IT083IU Special Study of the Field (3,0)		
	IT1 60I U	Khai thác dữ liệu	Data Mining	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object-		

							Oriented Programming
IT1 30I U	Xử lý ảnh Kỹ thuật số	Digital Image Proces sing	Tự chọn	4	3	1	
IT1 14I U	Kiến trúc phần mềm	Softwa re Archit ecture	Tự chọn	4	3	1	
IT0 96I U	Lập trình mạng	Net- centric Progra mming	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT0 94I U	Quản lý hệ thống thông tin	Inform ation System Manag ement	Tự chọn	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management
IT0 56I U	Quản lý dự án CNTT	IT Project Manag ement	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT0 24I U	Đồ hoạ Máy tính	Compu ter Graphi cs	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 57I U	Học sâu	Deep Learni ng	Tự chọn	4	3	1	
IT1 34I U	Interne t Vạn vật	Interne t of Things	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks

IT1 33I U	Phát triển ứng dụng di động	Mobile Applic ation Develo pment	Tự chọn	4	3	1	Môn học học trước IT090IU (3,1) Object- Oriented Analysis and Design
IT0 44I U	Tương tác người và máy	Human Compu ter Interac tion	Tự chọn	4	3	1	
IT1 64I U	Điện toán đám mây	Cloud compu ting	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 65I U	Công nghệ và Triển khai bảo mật	Securit y Techn ology and Imple mentat ion	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 661 U	Kiểm tra chất lượng phần mềm	Softwa re Qualit y Verific ation and Validat ion	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 67I U	Phát triển ứng dụng game	Game Applic ation Develo pment	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 50I U	Chuỗi khối	Blockc hain	Tự chọn	4	3	1	

IT1 56I U	Phát triển và vận hành liên tục	Develo pment & Operat ion (DevO	Tự chọn	4	3	1	
IT1 38I U	Trực quan hóa dữ liệu	Data Scienc e and Visuali zation	Tự chọn	4	3	1	
Tổng				10	9	1	
Tổng				187	149	38	

10.4. Trình độ IE0

Bảng 9. Kế hoạch giảng dạy đối với người học đạt trình độ IEO

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	Tiế ng Anh		Tổng cộng	Lý thuyết	Thực hành/T hí nghiệm	
I (tổn g số	EN TP0 0	Tiếng Anh Tăng Cường 0	Inte nsiv e Engl ish 0	Bắt buộc	17	17	0	Không
g số 17 tín chỉ)	EN TP0 1	Tiếng Anh Tăng Cường 1	Inte nsiv e Engl ish 1	Bắt buộc	17	17	0	Môn học trước Tiếng Anh Tăng Cường l

	Tổng				34	34	0	
II (tổn g số 17 tín chỉ)	EN TP0 2	Tiếng Anh Tăng Cường 2	Inte nsiv e Engl ish 2	Bắt buộc	17	17	0	Môn học trước Tiếng Anh Tăng Cường 1
	Tổng	I	I		17	17	0	
	MA 001I U	Toán 1	Calc ulus 1	Bắt buộc	4	4	0	Không
	IT0 64I U	Nhập môn Tin học	Intr odu ctio n to Co mpu ting	Bắt buộc	3	3	0	Không
III (tổn g số	EN0 08I U	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	List enin g AE1	Bắt buộc	2	2	0	Không
17 tín chỉ)	PH0 13I U	Vật lý 1	Phy sics 1	Bắt buộc	2	2	0	Không
	EN0 07I U	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Writ ing AE1	Bắt buộc	2	2	0	Không
	IT1 16I U	Lập trình C/C++	C/C ++ Prog ram min g	Bắt buộc	4	3	1	Không
	Tổng				17	16	1	

IV (tổn g số 19 tín chỉ)	PH0 15I U	Vật lý 3	Phy sics 3	Bắt buộc	3	3	0	Môn học trước PH013IU Physics 1 và học song hành môn PH016IU Physics 3 Laboratory
	РН0 16І U	Thực hành Vật lý 3	Phy sics 3 Lab orat ory	Bắt buộc	1	0	1	Học song hành môn PH015IU Physics 3
	EN0 12I U	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Spe akin g AE2	Bắt buộc	2	2	0	Môn học trước EN008IU Listening AE1 và EN007IU Writing AE1
	EN0 11I U	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Writ ing AE2	Bắt buộc	2	2	0	MônhọctrướcEN008IUListeningAE1AE1vàEN007IUWriting AE1
	IT0 69I U	Lập trình hướng đối tượng	Obj ect- Orie nted Prog ram min g	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming

	IT1 53I U	Toán rời rạc	Disc rete Mat hem atics	Bắt buộc	3	3	0	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming ; IT154IU (3,0) Linear Algebra hoặc MA023IU (4,0) Calculus 3
	IT0 91I U	Mạng máy tính	Co mpu ter Net wor ks	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
	Tổng				19	16	3	
V	MA 003I U	Toán 2	Calc ulus 2	Bắt buộc	4	4	0	Môn học học trước MA001IU (4,0) Calculus 1
V (tổn g số 20 tín chỉ)	IT1 54I U	Đại số tuyến tính	Line ar Alg ebra	Bắt buộc	3	3	0	Không
	IT0 13I U	Cấu trúc dữ liệu và giải thuật	Alg orith ms and Data	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object-

			Stru					Oriented
			ctur					Programming
			es					
	IT0 79I U	Nguyên lý Quản trị Cơ sở dữ liệu	Prin cipl es of Data base Man age men t	Bắt buộc	4	3	1	Môn học học trước IT116IU (3,1) C/C++ Programming hoặc IT149IU (3,1) Fundamentals of Programming
	PE0 15I U	Triết học Mác- Lênin	Phil osop hy Mar x - Leni n	Bắt buộc	3	3	0	Không
	PE0 16I U	Kinh tế chính trị Mác- Lênin	Mar xist - Leni nist Polit ical Eco nom y	Bắt buộc	2	2	0	Không
	Tống				20	18	2	
VI (tổn g số 19 tín	PT0 01I U	Giáo dục thể chất 1	Phy sical Trai ning 1	Bắt buộc	3	0	3	Không
chỉ, tron g đó	ITO 89I U	Kiến trúc máy tính	Co mpu ter	Bắt buộc	4	3	1	Không

sinh viên chọ n 1 môn tự chọ n 4 tín chỉ)	IT0 90I U	Phân tích và thiết kế hướng đối tượng	Arc hite ctur e Obj ect- Orie nted Ana lysis and Desi gn	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
	IT0 93I U	Phát triển ứng dụng Web	Web App licat ion Dev elop men t	Bắt buộc	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management và IT069IU (3,1) Object- Oriented Programming
	IT0 94I U	Quản lý hệ thống thông tin	Info rmat ion Syst em Man age men t	Tự chọn	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management
	IT0 56I U	Quản lý dự án CNTT	IT Proj ect Man age men t	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming

	IT0 24I U	Đồ hoạ Máy tính	Co mpu ter Gra phic s	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
-	IT1 57I U	Học sâu	Dee p Lear ning	Tự chọn	4	3	1	
	IT1 34I U	Internet Vạn vật	Inter net of Thin gs	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
-	IT1 33I U	Phát triển ứng dụng di động	Mob ile App licat ion Dev elop men t	Tự chọn	4	3	1	Môn học học trước IT090IU (3,1) Object- Oriented Analysis and Design
_	IT0 44I U	Tương tác người và máy	Hu man Co mpu ter Inter acti on	Tự chọn	4	3	1	
	IT1 64I U	Điện toán đám mây	Clo ud com puti ng	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
	IT1 65I U	Công nghệ và Triển	Sec urity Tec	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1)

	khai bảo mật	hnol ogy and Impl eme ntati					Computer Networks
IT1 66I U	Kiểm tra chất lượng phần mềm	on Soft war e Qua lity Veri ficat ion and Vali dati on Ga	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 67I U	Phát triển ứng dụng game	me App licat ion Dev elop men t	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 50I U	Chuỗi khối	Bloc kcha in	Tự chọn	4	3	1	
IT1 56I U	Phát triển và vận hành liên tục	Dev elop men t & Ope ratio n (De	Tự chọn	4	3	1	

			vOp s)					
	IT1 38I U	Trực quan hóa dữ liệu	Data Scie nce and Visu aliza tion	Tự chọn	4	3	1	
	PE0 08I U	Tư Duy Phản Biện	Criti cal Thin king	Tự chọn	3	3	0	
	Tổng				19	12	7	
VII (tổn g số	PT0 02I U	Giáo dục thể chất 2	Phy sical Trai ning 2	Bắt buộc	3	0	3	Không
g so 20 tín chỉ, tron g đó sinh viên chọ n 2 viên chọ n 2 môn tự chọ n 8 tín chỉ)	MA 026I U	Xác suất, thống kê và quá trình ngẫu nhiên	Prob abili ty, Stati stic & Ran dom Proc ess	Bắt buộc	3	3	0	Môn học trước MA001IUCal culus 1 and MA003IU Calculus 2
	РЕ0 17І U	Chủ nghĩa xã hội khoa học	Scie ntifi c Soci alis m	Bắt buộc	2	2	0	Môn học trước PE016IU (2,0) Marxist – Leninist Political Economy
	ITO 92I U	Nguyên lý của Ngôn	Prin cipl es of	Bắt buộc	4	3	1	

		ngữ lập trình	Prog ram min g Lan gua ges					
	IT1 60I U	Khai thác dữ liệu	Data Min ing	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object- Oriented Programming
	IT1 30I U	Xử lý ảnh Kỹ thuật số	Digi tal Ima ge Proc essi ng	Tự chọn	4	3	1	
	IT1 14I U	Kiến trúc phần mềm	Soft war e Arc hite ctur e	Tự chọn	4	3	1	
	IT0 96I U	Lập trình mạng	Net- cent ric Prog ram min g	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
	Tổng				20	14	6	
VIII - (tổn	IT0 76I U	Công nghệ Phần mềm	Soft war e Engi	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object-

g số 10			neer					Oriented
tín chỉ, tron g đó sinh viên chọ n 1 môn	IT1 59I U	Trí thông minh nhân tạo	Arti ficia l Intel lige nce	Bắt buộc	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming và IT153IU (3,0) Discrete Mathematics
tự chọ n tự do 3	PE0 21I U	Pháp luật đại cương	Gen eral law	Bắt buộc	3	3	0	Không
do 3 tín chỉ)	PE0 18I U	Lịch sử Đảng Cộng Sản Việt Nam	Hist ory of Viet nam ese Co mm unis t Part y	Bắt buộc	2	2	0	Môn học trước PE017IU (2,0) Scientific Socialism
		Tự chọn tự do	Free elect ive		3	3	0	Không
	IT1 20I U	Khởi nghiệp	Entr epre neur ship	Bắt buộc	3	3	0	Không
	Tổng			1	19	17	2	
IX- (tổn g số 3	ITO 82I U	Thực tập công nghiệp	Inter nshi p	Bắt buộc	3	0	3	Không

tín chỉ) Tổng 3 0 3 Môn học học trước IT089IU (3,1) Ope Computer IT0 ratin Architecture Hệ điều IT013IU 3 1 và 17I 4 g hành (3,1) U Syst Algorithms ems and Data Structure Môn hoc Х Но trước (tổn Chi PE018IU Tư g số PE0 Min (2,0) History tưởng 13 19I h's 2 2 0 Hồ Chí tín of U Tho chỉ) Vietnamese Minh ught Communist S Party Spe cial IT0 Thực tập Stud tốt Không 83I y of 3 0 3 U nghiệp the Fiel d Tổng 5 13 8 Sinh viên có GPA >= 70: chọn môn Thesis XI Môn hoc (tổn g số trước IT0 Luân Bắt IT083IU 10 The văn tốt 58I 10 0 10 or Special Study sis buộc U nghiệp 11 of the Field tín (3,0) chỉ) 0 Tổng cộng 10 10

Sinh	viên có GP	PA < 7	0: chọn n	1ôn Thụ	rc tập tốt ng	ghiệp 2 và	2 môn tự chọn
(sinh	viên chọn	2 môn	tự chọn	ít nhất 7	tín chỉ)		
IT1 681 U	Thực tập tốt nghiệp 2	Spe cial Stud y of the Fiel d 2	Bắt buộc	3	0	3	Môn học trước IT083IU Special Study of the Field (3,0)
IT1 60I U	Khai thác dữ liệu	Data Min ing	Tự chọn	4	3	1	Môn học trước IT069IU (3,1) Object- Oriented Programming
IT1 30I U	Xử lý ảnh Kỹ thuật số	Digi tal Ima ge Proc essi ng	Tự chọn	4	3	1	
IT1 14I U	Kiến trúc phần mềm	Soft war e Arc hite ctur e	Tự chọn	4	3	1	
IT0 96I U	Lập trình mạng	Net- cent ric Prog ram min g	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT0 94I U	Quản lý hệ thống thông tin	Info rmat ion Syst em Man age	Tự chọn	4	3	1	Môn học học trước IT079IU (3,1) Principles of Database Management

		men t					
IT0 56I U	Quản lý dự án CNTT	IT Proj ect Man age men t	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT0 24I U	Đồ hoạ Máy tính	Co mpu ter Gra phic s	Tự chọn	4	3	1	
IT1 57I U	Học sâu	Dee p Lear ning	Tự chọn	4	3	1	
IT1 34I U	Internet Vạn vật	Inter net of Thin gs	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 33I U	Phát triển ứng dụng di động	Mob ile App licat ion Dev elop men t	Tự chọn	4	3	1	Môn học học trước IT090IU (3,1) Object- Oriented Analysis and Design
IT0 44I U	Tương tác người và máy	Hu man Co mpu ter Inter acti on	Tự chọn	4	3	1	
IT1 64I U	Điện toán	Clo ud com	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1)

	đám mây	puti ng					Computer Networks
IT1 65I U	Công nghệ và Triển khai bảo mật	Sec urity Tec hnol ogy and Impl eme ntati on	Tự chọn	4	3	1	Môn học học trước IT091IU (3,1) Computer Networks
IT1 66I U	Kiểm tra chất lượng phần mềm	Soft war e Qua lity Veri ficat ion and Vali dati on	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 67I U	Phát triển ứng dụng game	Ga me App licat ion Dev elop men t	Tự chọn	4	3	1	Môn học học trước IT069IU (3,1) Object- Oriented Programming
IT1 50I U	Chuỗi khối	Bloc kcha in	Tự chọn	4	3	1	
IT1 56I U	Phát triển và vận hành liên tục	Dev elop men t & Ope ratio n (De vOp s)	Tự chọn	4	3	1	

IT1 38I U	IT1 Trực Data Scie quan nce 38I hóa dữ liệu aliza tion		Tự chọn	4	3	1	
Tổng	Tổng				9	1	
Tổng				204	166	38	

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

Mức độ đóng góp của các môn học vào chuẩn đầu ra của CTĐT ngành Khoa học Máy tính được trình bày như Bảng 10.

Bảng 10. Đóng góp của các môn học vào CĐR của CTĐT

Học kỳ	Tên môn học	Chuẩn đầu ra của CTĐTPLO1PLO2PLO3PLO4PLO5PLO6 $\checkmark \checkmark$ IIII \checkmark II<					
		PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
	Calculus 1	$\sqrt{}$					
	Introduction to Computing	\checkmark			\checkmark	\checkmark	
I	Listening AE1			$\sqrt{\sqrt{\sqrt{1}}}$			
	Physics 1	\checkmark					
	Writing AE1			$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{$			
	C/C++ Programming	\checkmark	$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{$				
	Physics 3	\checkmark					
	Physics 3 Laboratory	\checkmark					
н	Speaking AE2			$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{$			
11	Writing AE2			$\sqrt{\sqrt{\sqrt{1}}}$			
	Object-Oriented Programming	$\checkmark\checkmark$	~~~				\checkmark
	Discrete Mathematics	\checkmark	\checkmark				\checkmark

	Computer Networks	$\sqrt{}$	$\sqrt{\sqrt{}}$			\checkmark	
	Calculus 2	$\sqrt{}$					
	Linear Algebra	\checkmark	\checkmark		\checkmark		
	Algorithms and Data Structures	$\sqrt{}$	$\sqrt{\sqrt{\sqrt{1}}}$				\checkmark
III	Principles of Database Management	$\sqrt{\sqrt{\sqrt{1}}}$	$\sqrt{\sqrt{\sqrt{1}}}$			$\sqrt{}$	
	Philosophy Marx - Lenin				$\sqrt{}$		
	Marxist – Leninist Political Economy				$\sqrt{}$		
	Computer Architecture	\checkmark	\checkmark				\checkmark
	Object-Oriented Analysis and Design	\checkmark	\checkmark			\checkmark	
	Web Application Development	\checkmark	\checkmark			\checkmark	\checkmark
	InformationSystemManagement(môn tựchọn)(môn tự		\checkmark		\checkmark		
V (sinh viên	IT Project Management (môn tự chọn)		\checkmark	\checkmark		\checkmark	\checkmark
chọn 1 môn tự chọn 4	Computer Graphics (môn tự chọn)	\checkmark	\checkmark			\checkmark	\checkmark
tín chỉ)	Deep Learning (môn tự chọn)	\checkmark	\checkmark				\checkmark
	Internet of Things (môn tự chọn)		$\sqrt{\sqrt{\sqrt{1}}}$			$\checkmark\checkmark$	\checkmark
	Mobile Application Development (môn tự chọn)	$\sqrt{}$	$\sqrt{\sqrt{\sqrt{1}}}$				\checkmark
	Human Computer Interaction (môn tự chọn)	\checkmark	\checkmark	$\checkmark\checkmark$			

	Cloud computing (môn tự chọn)	\checkmark	$\sqrt{}$				\checkmark
	Security Technology and Implementation (môn tự chọn)	$\checkmark\checkmark$	\checkmark	\checkmark	\checkmark		
	SoftwareQualityVerificationandValidation (môn tự chọn)	$\sqrt{}$	$\sqrt{}$				\checkmark
	GameApplicationDevelopment(môn tựchọn)	\checkmark	$\sqrt{}$				\checkmark
	Blockchain (môn tự chọn)	\checkmark	$\sqrt{}$				\checkmark
	Development & Operation (DevOps) (môn tự chọn)	\checkmark	$\checkmark\checkmark$				\checkmark
	DataScienceandVisualization(môntựchọn)	\checkmark	$\sqrt{}$	\checkmark			
	Critical Thinking (môn tự chọn)			$\sqrt{}$	\checkmark		
	Probability, Statistic & Random Process	$\checkmark\checkmark$					
	Scientific Socialism				$\sqrt{}$		
VI (sinh	PrinciplesofProgramming Languages	\checkmark	\checkmark				
viên chọn 2 viên	Data Mining (môn tự chọn)	\checkmark				\checkmark	\checkmark
chọn 2 môn tự chọn 8	Digital Image Processing (môn tự chọn)	\checkmark				\checkmark	\checkmark
tín chỉ)	SoftwareArchitecture(môn tự chọn)	\checkmark	\checkmark				\checkmark
-	Net-centric Programming (môn tự chọn)	\checkmark	$\sqrt{\sqrt{\sqrt{1}}}$				\checkmark
VI	Internship		\checkmark		\checkmark	\checkmark	\checkmark

	Software Engineering			$\checkmark\checkmark$		$\sqrt{\sqrt{}}$	$\sqrt{\sqrt{}}$
VII (sinh	Artificial Intelligence	\checkmark	\checkmark				\checkmark
viên	General law				$\sqrt{}$	\checkmark	
chọn 1 môn tự chon	History of Vietnamese Communist Party				$\sqrt{}$		
tự do)	Free elective						
	Entrepreneurship			\checkmark	\checkmark	\checkmark	
	Operating Systems	\checkmark	\checkmark				
VIII	Ho Chi Minh's Thoughts				$\sqrt{}$		
	Special Study of the Field		\checkmark	\checkmark			\checkmark
	Thesis	\checkmark	\checkmark	\checkmark			\checkmark
	Special Study of the Field 2	$\sqrt{\sqrt{\sqrt{1}}}$	$\sqrt{\sqrt{\sqrt{1}}}$				\checkmark
	Data Mining (môn tự chọn)	\checkmark				\checkmark	\checkmark
	Digital Image Processing (môn tự chọn)	\checkmark				\checkmark	\checkmark
	SoftwareArchitecture(môn tự chọn)	\checkmark	\checkmark				\checkmark
IX	Net-centric Programming (môn tự chọn)	\checkmark	$\sqrt{\sqrt{\sqrt{1}}}$				\checkmark
	InformationSystemManagement(môn tựchọn)(môn tự		\checkmark		\checkmark		
	IT Project Management (môn tự chọn)		\checkmark	\checkmark		\checkmark	\checkmark
	Computer Graphics (môn tự chọn)	\checkmark	\checkmark			\checkmark	\checkmark
	Deep Learning (môn tự chọn)	\checkmark	\checkmark				\checkmark

Internet of Things (môn tự chọn)		$\sqrt{\sqrt{\sqrt{1}}}$			$\checkmark\checkmark$	\checkmark
MobileApplicationDevelopment(môn tựchọn)	$\checkmark\checkmark$	$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{$				\checkmark
HumanComputerInteraction (môn tự chọn)	\checkmark	\checkmark	$\sqrt{}$			
Cloud computing (môn tự chọn)	\checkmark	$\checkmark\checkmark$				\checkmark
Security Technology and Implementation (môn tự chọn)	$\checkmark\checkmark$	\checkmark	\checkmark	\checkmark		
SoftwareQualityVerificationandValidation (môn tự chọn)	$\checkmark\checkmark$	$\checkmark\checkmark$				\checkmark
Game Application Development (môn tự chọn)	\checkmark	$\checkmark\checkmark$				\checkmark
Blockchain (môn tự chọn)	\checkmark	$\checkmark\checkmark$				\checkmark
Development & Operation (DevOps) (môn tự chọn)	\checkmark	$\sqrt{}$				\checkmark
Data Science and Visualization (môn tự chọn)	\checkmark	$\sqrt{}$	\checkmark			

12 Mô tả vắn tắt nội dung và khối lượng các môn học

12.1. PE015IU - Triết học Mác-Lênin (Philosophy Marx - Lenin)

Số tín chỉ : 3 (3LT + 0TH)
Điều kiện tiên quyết/Môn học trước: không
Mô tả môn học:
Môn học trang bị cho sinh viên những kiến thức cơ bản về triết học Mác-Lênin.

12.2. PE016IU - Kinh tế chính trị Mác-Lênin (Marxist – Leninist Political Economy)

Số tín chỉ : 2 (2LT + 0TH) Môn học song hành: Triết học Mác-Lênin Mô tả môn 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-Lênin theo mục tiêu của môn học. Cụ thể các vấn đề như: Hàng hóa, thị trường và vai trò của các chủ thể trong nền kinh tế thị trường; Sản xuất giá trị thặng dư trong nền kinh tế thị trường; 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 lợi ích kinh tế ở Việt Nam; Công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế ở Việt Nam.

12.3. PE017IU - Chủ nghĩa xã hội khoa học (Scientific Socialism)

Số tín chỉ : 2 (2LT + 0TH)

Điều kiện tiên quyết/Môn học trước: Triết học Mác-Lênin, Kinh tế chính trị Mác-Lênin Mô tả môn học:

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

12.4. PE018IU - Lịch sử Đảng Cộng Sản Việt Nam (History of Vietnamese Communist Party)

Số tín chỉ : 2 (2LT + 0TH)

Điều kiện tiên quyết/Môn học trước: Triết học Mác-Lênin, Kinh tế chính trị Mác-Lênin, Chủ nghĩa xã hội khoa học.

Mô tả môn học:

Môn học trang bị cho sinh viên những kiến thức cơ bản về lịch sử Đảng Cộng Sản Việt Nam.

12.5. PE019IU - Tư tưởng Hồ Chí Minh (Ho Chi Minh's Thoughts)

Số tín chỉ : 2 (2LT + 0TH)

Điều kiện tiên quyết/Môn học trước: Triết học Mác-Lênin, Kinh tế chính trị Mác-Lênin, Chủ nghĩa xã hội khoa học.

Mô tả môn học:

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 đoàn kết quốc tế; về văn hóa, đạo đức, con người.

12.6. MA001IU - Toán 1 (Calculus 1)

Số tín chỉ : 4 (4LT + 0TH) Điều kiện tiên quyết/Môn học trước: Không Mô tả môn học:
Nội dung chính: Hàm số, Giới hạn, Tính liên tục, Đạo hàm, Đạo hàm cho các hàm cơ bản, Qui tắc tính đạo hàm, Ứng dụng của đạo hàm, 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 tính tích phân.

12.7. MA003IU- Toán 2 (Calculus 2)

Số tín chỉ : 4 (4LT + 0TH)

Điều kiện tiên quyết/Môn học trước: Toán 1

Mô tả môn học:

Dãy và chuỗi; Kiểm tra sự hội tụ; Chuỗi mů; Chuỗi Taylor và Maclaurin; Hệ tọa độ Cartesian; Đường thẳng, Mặt và Mặt phẳng; Đạo hàm và tích phân của hàm Vécto; Chiều dài đường cong; Mặt phẳng tham số; Mặt tiếp xúc; Vécto Gradient; Cực trị; Nhân tử Lagrange; Tích phân bội: tích phân hai lớp, tích phân ba lớp, những kỹ thuật tính tích phân; Trường Vécto, tích phân đường, tích phân mặt.

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: Toán 1, Toán 2 **Mô tả môn học**:

Phương trình vi phân cấp một, phương trình vi phân cấp hai, hệ số không xác định, phương sai của tham số, phương trình vi phân tuyến tính cấp cao, nghiệm chuỗi của phương trình vi phân tuyến tính cấp hai với hệ số không là hằng, hệ phương trình tuyến tính cấp một, cơ bản về phương trình đạo hàm riêng và phương pháp tách biến, phương pháp số.

12.8. MA026IU - Xác suất, thống kê và quá trình ngẫu nhiên (Probability, Statistic & Random Process)

Số tín chỉ : 3 (3LT + 0TH) Điều kiện tiên quyết/Môn học trước: Toán 1, Toán 2 Mô tả môn học:

Môn học trình bày lý thuyết xác suất theo quan điểm độ đo. Nội dung chính bao gồm kiến thức về các biến cố (độc lập, có điều kiện,...), các biến ngẫu nhiên, phân phối, kỳ vọng, phương sai và các định lý giới hạn quan trọng trong xác suất (định lý giới hạn trung tâm, luật số lớn, ...).

12.9. PH013IU - Vật lý 1 (Physics 1)

Số tín chỉ : 2 (2LT + 0TH) Điều kiện tiên quyết/Môn học trước: Không Mô tả 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.

12.10. PH015IU & PH016IU - Vật lý 3 (Physics 3 + Physics 3 Laboratory)

Số tín chỉ : 4 (3LT + 1TH) Điều kiện tiên quyết/Môn học trước: Vật lý 1

Mô tả môn học:

Môn học cung cấp cho sinh viên những kiến thức cơ bản về điện và từ.

12.11. IT154IU - Đại số tuyến tính (Linear algebra)

Mã MH: IT154IU

Số tín chỉ: 3 (3,0)

Điều kiện tiên quyết/Môn học trước: Toán 1

Mô tả môn học:

Đại số tuyến tính cung cấp một khuôn khổ toán học để tổ chức thông tin và sau đó sử dụng thông tin đó để giải quyết các vấn đề, đặc biệt là các vấn đề phân tích dữ liệu. Đại số tuyến tính rất cần thiết để hiểu và tạo ra các thuật toán học máy, đặc biệt là mạng thần kinh và các mô hình học sâu.

Khóa học này sẽ cung cấp cho sinh viên kiến thức đại số tuyến tính cần thiết cho học máy và mô hình mạng thần kinh. Học sinh sẽ tìm hiểu tổng quan về ma trận cơ bản và đại số vector như được áp dụng cho các hệ thống tuyến tính. Sau đó, họ sẽ học cách thao tác ma trận để có được kiến thức hữu ích từ dữ liệu, định lượng mức độ học tập và tối ưu hóa tốc độ học tập trong không gian vector và chuyển đổi tuyến tính để khám phá dữ liệu. Các bài học và bài tập thực hành sẽ trang bị cho sinh viên nền tảng toán học cần thiết để xây dựng và đào tạo các mạng thần kinh đơn giản trong các ứng dụng khai thác dữ liệu.

12.12. IT153IU – Toán rời rạc (Discrete Mathematics)

Số tín chỉ: 3 (3LT + 0TH)

Điều kiện tiên quyết/Môn học trước: C/C++ Programming hoặc Fundamentals of Programming; Linear Algebra hoặc Calculus 3

Mô tả môn học:

Môn học giúp sinh viên phát triển khả năng tư duy, suy nghĩ và diễn giải dựa trên toán học, logic, ứng dụng khả năng này để phân tích, xử lý và giải quyết các đối tượng rời rạc trong thực tế. Đây là khóa học hướng ứng dụng dựa trên việc nghiên cứu các sự kiện xảy ra là nhỏ hay rời rạc phân đoạn trong khoa học, kinh tế, công nghiệp.... Sinh viên sẽ được giới thiệu các công cụ toán học về toán rời rạc như: lý thuyết tổ hợp; lý thuyết quan hệ (quan hệ tương đương, quan hệ sắp xếp); bài toán đếm (giới thiệu về bài toán và phần mở rộng về hệ thức truy hồi); bài toán tồn tại; bài toán liệt kê; lý thuyết đại số Boole; lý thuyết đồ thị và cây. Các ứng dụng thực tế sẽ được giới thiệu trong suốt khóa học.

12.13. PE021IU – Pháp Luật Đại cương

Số tín chỉ : 3 (3LT + 0TH) Điều kiện tiên quyết/Môn học trước: không Mô tả môn học: Môn học sẽ giới thiệu cho sinh viên hệ thống pháp luật Việt Nam. Đặc biệt, sinh viên sẽ hiểu được quyền và nghĩa vụ của mình trong Hiến pháp, luật Hình sự, luật hành chính, luật dân sự, luật lao động và luật doanh nghiệp của Việt Nam. Từ đó, sinh viên sẽ nâng cao nhận thức về trách nhiệm đảm bảo công lý, trong đó có việc chấm dứt tham nhũng trong xã hội.

12.14. EN007IU & EN008IU - Tiếng anh chuyên ngành 1 (Academic English 1)

Số tín chỉ : 4 (4LT + 0TH)

Điều kiện tiên quyết/Môn học trước: không

Mô tả môn học:

Môn học nhằm nâng cao kỹ năng viết trình độ tiền 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 đọan, 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. 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 giồi thêm vốn từ vựng học thuật.

12.15. EN011IU & EN012IU - Tiếng anh chuyên ngành 2 (Academic English 2)

Số tín chỉ : 4 (4LT + 0TH)

Điều kiện tiên quyết/Môn học trước: Tiếng anh chuyên ngành 1 Mô tả môn học:

Khóa 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 khóa 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. Môn học cung cấp cho sinh viên các chiến lược thiết thực sử dụng trong việc thuyết trình. Ngòai 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.

12.16. IT064IU - Nhập môn Tin học (Introduction to computing)

Số tín chỉ: 3 (3 LT+0TH)

Điều kiện tiên quyết/Môn học trước: Không

Mô tả môn học:

Môn học giới thiệu những khái niệm cơ bản, những mô hình và xu hướng trong ngành công nghiệp Công nghệ thông tin. Ngoài ra, sinh viên được giới thiệu về các chuyên ngành, về cơ cấu các môn học trong mỗi chuyên ngành, ý nghĩa của các môn học, các nghề nghiệp liên quan đến mỗi chuyên ngành, định hướng nghề nghiệp cho sinh viên.

12.17. IT116IU - Lập trình C/C++ (C/C++ Programming)

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiên quyết/Môn học trước: Không

Mô tả môn học:

Môn học giúp phát triển những giải thuật và giới thiệu những nguyên tắc trong lập trình dùng C và C++. Các chủ đề bao gồm: giới thiệu máy tính và điện toán, phát triển chương trình, cú pháp ngôn ngữ lập trình C/C++ và các phương pháp số căn bản cho kỹ sư. Môi trường Unix và một số tiện ích cũng được giới thiệu trong môn học này.

12.18. IT069IU - Lập trình hướng đối tượng (Object Oriented Programming)

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình C/C++ hoặc Lập trình cơ bản Mô tả môn học:

Lập trình và các cấu trúc dữ liệu cơ bản dùng ngôn ngữ Java. Các cấu trúc điều khiển cơ bản như vòng lặp, mảng, đệ qui và con trỏ. Thiết kế hướng đối tương: lớp, thừa kế, overload và đa hình. Cấu trúc dữ liệu trừu tượng: danh sách, danh sách liên kết, chồng và hàng. Giới thiệu về phân tích giải thuật, dùng ký hiệu O, các phương pháp tìm kiếm và sắp xếp.

12.19. IT013IU - Cấu trúc dữ liệu và giải thuật (Algorithms and Data Strutures)

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình hướng đối tượng

Mô tả môn học:

Tìm hiểu những đặc điểm quan trọng của cấu trúc dữ liệu và giải thuật. Cách sử dụng những cấu trúc này để hỗ trợ thiết kế giải thuật. Giới thiệu về các kỹ thuật tìm kiếm, sắp xếp và băm.

12.20. IT079IU - Nguyên lý Quản trị Cơ sở dữ liệu (Principle of Database Management).

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình C/C++ hoặc Lập trình cơ bản Mô tả môn học:

Môn học nhằm cung cấp cho người học kiến thức tổng quan về: kiến trúc Cơ sở dữ liệu (CSDL), phương pháp quản trị CSDL; các mô hình dữ liệu phân cấp, mô hình dữ liệu mạng và mô hình dữ liệu quan hệ; phương pháp thiết kế mô hình thực thể kết hợp và mô hình cơ sở dữ liệu quan hệ; các phụ thuộc hàm cho dữ liệu và cách chuẩn hóa dữ liệu, các ràng buộc toàn vẹn dữ liệu và bảo mật dữ liệu; các cơ chế quản lý giao tác cho hệ quản trị CSDL đa người dùng; ngoài ra môn học còn giới thiệu một số hệ quản trị CSDL thông dụng như SQL Server và một số hệ quản trị CSDL thương mại khác.

12.21. IT089IU - Cấu trúc máy tính (Computer Architecture)

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiên quyết/Môn học trước: Thiết kế logic số

Mô tả môn học:

Lịch sử và các nguyên lý của cấu trúc máy tính, cấu tạo máy tính, hợp ngữ và mã máy tính, số học của máy tính, thiết kế ALU, hiệu năng của máy tính, đường dẫn dữ liệu và điều khiển, pipelining, cấu trúc phân tầng của bộ nhớ, thiết bị xuất nhập, và các bộ xử lý di động cũng như đa lõi.

12.22. IT091IU - Mạng Máy Tính (Computer Networks)

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiền quyết/Mốn học trước: Lập trình C/C++, Lập trình hướng đối tượng Mô tả môn học:

Giới thiệu về mạng, cấu trúc OSI, chuyển mạch gói, mạng nội bộ, Ethernet, mạng không dây, và các giao thức mạng.

12.23. IT090IU- Phân tích và thiết kế hướng đối tượng (Object Oriented Analysis and Design)

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình hướng đối tượng Mô tả môn học:

Mô hình hóa hệ thống. Các khái niệm về phân tích và thiết kế hệ thống. Chu kỳ phát triển sản phẩm. Quy trình hợp nhất và những công đoạn thực hiện như: lấy yêu cầu, phân tích, thiết kế, hiện thực và kiểm thử. Nội dung nâng cao bao gồm cơ sở dữ liệu hướng đối tượng, mẫu thiết kế, lập trình Extreme.

12.24. IT076IU - Công nghệ phần mềm (Software Engineering)

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình hướng đối tượng Mô tả môn học:

Môn học giới thiệu quy trình công nghệ phần mềm. Khảo sát hoạt động doanh nghiệp. Thảo luận với khách hàng về yêu cầu. Chọn công nghệ thiết kế. Phân tích hệ thống theo hướng đối tượng. Thiết kế và lập trình dự án.

12.24. IT093IU - Phát triển ứng dụng Web (Web Application Development)

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình hướng đối tượng, Nguyên lý Quản Trị Cơ sở dữ liệu

Mô tả môn học:

Sử dụng các kiến thức và kỹ năng để phát triển ứng dụng Web dựa trên các tiện ích, công nghệ và môi trường phát triển của Java như HTML, Java Server Page, Java Bean, MVC Model. Ngoài ra còn mở rộng thêm các kiến thức liên quan đến kiến trúc của Java như Ajax và Struts. Môn học này làm nền tảng để sinh viên thực hiện các đề án môn học cũng như luận văn tốt nghiệp theo hướng Web.

12.25. IT092IU - Nguyên lý Ngôn ngữ lập trình (Principle of Programming Languages)

Số tín chỉ : 4 (3LT + 1TH) Điều kiện tiên quyết/Môn học trước: không Mô tả môn học:

Môn học nhằm làm cho người học quen thuộc với một số khái niệm cơ bản của các ngôn ngữ lập trình, từ đó nâng cao khả năng tiếp thu các ngôn ngữ lập trình khác. Các kiểu ngôn ngữ lập trình khác nhau (chẳng hạn như ngôn ngữ lập trình luận lý, ngôn ngữ lập trình chức năng, ngôn ngữ lập trình thủ tục, ngôn ngữ lập trình hướng đối tượng) cũng được so sánh và các phương pháp cài đặt cũng được tìm hiểu và thảo luận.

12.26. IT017IU - Hệ điều hành (Operating System)

Số tín chỉ: 4 (3 LT+1TH)

Điều kiện tiền quyết/Môn học trước: Cấu trúc dữ liệu và giải thuật, Kiến trúc máy tính, Lập trình C/C++

Mô tả môn học:

Môn học trang bị cho sinh viên khả năng định nghĩa và giải thích các nguyên lý của hệ điều hành. Hiểu về kiến trúc của một hệ điều hành. Khả năng lập trình để giao tiếp với các chức năng và dịch vụ hệ thống.

12.27. IT159IU - Trí thông minh nhân tạo (Artificial Intelligent)

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: Toán rời rạc hoặc Đại số tuyến tính, Lập trình hướng đối tượng

Mô tả môn học:

Môn học nhằm cung cấp một cách tiếp cận kỹ thuật vào các khái niệm cơ bản trong lĩnh vực trí tuệ nhân tạo. Nội dung cụ thể bao gồm: lịch sử trí tuệ nhân tạo, các tác tử, các phương pháp tìm kiếm (tìm kiếm trên không gian trạng thái, tìm kiếm có thông tin và tìm kiếm không có thông tin, tìm kiếm thỏa mãn ràng buộc hoặc tìm kiếm cho trò chơi), biểu diễn tri thức (biểu diễn tri thức cụ thể bằng logic, hệ thống lập luận bằng logic), hoạch định, và ngôn ngữ Lisp. Môn học này thích hợp cho sinh viên nào muốn có một kiến thức cơ bản vững chắc về trí tuệ nhân tạo hoặc chuẩn bị cho những phát triển sâu hơn trong lĩnh vực Trí tuệ nhân tạo.

12.28. IT160IU – Khai thác Dữ liệu (Data Mining, môn tự chọn)

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình hướng đối tượng

Mô tả môn học:

Môn học này giới thiệu cho sinh viên các nguyên lý, thuật toán khai phá dữ liệu, yêu cầu của một quá trình khai phá dữ liệu. Học sinh sẽ nghiên cứu các khái niệm và thuật toán khai thác dữ liệu để giải quyết các vấn đề khám phá tri thức. Học sinh có thể phát triển các kỹ năng sử dụng phần mềm khai thác dữ liệu gần đây để giải quyết các vấn đề thực tế và tích lũy kinh nghiệm thực hiện nghiên cứu và học tập độc lập.

12.29. IT130IU – Xử lý ảnh Kỹ thuật số (Digital Image Processing, môn tự chọn) Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: không.

Mô tả môn học:

Môn học này giới thiệu cho sinh viên các nguyên lý, thuật toán khai phá dữ liệu, yêu cầu của một quá trình khai phá dữ liệu. Học sinh sẽ nghiên cứu các khái niệm và thuật toán khai thác dữ liệu để giải quyết các vấn đề khám phá tri thức. Học sinh có thể phát triển các kỹ năng sử dụng phần mềm khai thác dữ liệu gần đây để giải quyết các vấn đề thực tế và tích lũy kinh nghiệm thực hiện nghiên cứu và học tập độc lập.

12.30. IT114IU – Kiến trúc phần mềm (Software Architecture, môn tự chọn)

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: không.

Mô tả môn học:

Cung cấp cho sinh viên sự hiểu biết thấu đáo về các phương pháp và kỹ thuật khác nhau trong phân tích, thiết kế và triển khai hệ thống thông tin bằng cách sử dụng UML.

12.31. IT096IU - Lập trình mạng (Net-Centric Programming, môn tự chọn)

Số tín chỉ : 4 (3LT + 1TH) Điều kiên tiên quyết/Môn học trước

Điều kiện tiên quyết/Môn học trước: Mạng máy tính Mô tả môn học:

Môn học cung cấp các kiến thức cơ sở và nâng cao về các kỹ thuật lập trình mạng TCP/IP và UDP. Giúp sinh viên có khả năng xây dựng định dạng dữ liệu để thiết kế các giao thức truyền dữ liệu trên mạng. Hướng dẫn sinh viên lập trình được các ứng dụng có kết nối mạng Client/Server độc lập sử dụng ở mức socket và một số giao thức mạng cấp ứng dụng phổ biến như HTTP, FTP, DNS, Email... Môn học cũng cung cấp cho sinh viên các kỹ năng phát triển phần mềm trên các công cụ và môi trường trực quan như PyCharm, Visual Studio...

12.32. IT094IU - Quản lý Hệ thống thông tin (Information System Management, môn tự chọn)

Số tín chỉ : 4 (3LT + 1TH) Điều kiện tiên quyết/Môn học trước: Nguyên lý Quản trị Cơ sở dữ liệu Mô tả môn học:

Môn học hướng tới việc mô tả cách mà một hệ thống thông tin được sử dụng bởi các doanh nghiệp và sự ảnh hưởng của nó đến hoạt động của doanh nghiệp. Cùng với việc trình bày và tìm hiểu về công nghệ trong hệ thống thông tin, các vấn đề cơ bản là làm cách nào để các công nghệ được dùng giải quyết các vấn đề của doanh nghiệp và các cơ hội khai thác chúng. Nội dung cụ thể gồm các vấn đề liên quan đến tổ chức, quản lý, mạng doanh nghiệp; hạ tầng công nghệ thông tin doanh nghiệp; các hệ thống hỗ trợ quản lý và tổ chức cho doanh nghiệp số; xây dựng và quản lý hệ thống thông tin.

12.33. IT056IU - Quản trị Dự án Phần mềm (Software Project Management, môn tự chọn)

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình hướng đối tượng

Mô tả môn học:

Soạn đề cương kế hoạch dự án. Phỏng vấn và chuẩn bị yêu cầu khách hàng. Ước tính chi phí, thời gian, nhân lực để hoàn tất dự án. Quản lý công đoạn thiết kế và lập trìng hệ thống. Kiểm soát chất lượng: thử nghiệm phần mềm, kiểm soát yêu cầu khách hàng.

12.34. IT024IU - Đồ hoạ máy tính (Computer Graphics, môn tự chọn)

Số tín chỉ : 4 (3LT + 1TH)

Điều kiện tiên quyết/Môn học trước: Lập trình C/C++, Lập trình hướng đối tượng Mô tả môn học:

Triển khai các giải thuật và ngôn ngữ cho việc tương tác trong đồ hoạ máy tính. Các khái niệm về hệ trục toạ độ trong không gian 2 chiều, 3 chiều, không gian véc tơ đường cong, bề mặt được sinh ra từ việc thiết kế, bố trí xây dựng các đối tượng đồ hoạ. Ngoài ra còn phát triển các mô hình kết hợp camera để tạo ảnh và xử lý ảnh.

12.35. IT157IU – Học sâu (Deep Learning, môn tự chọn)

Số tín chỉ : 4 (3LT + 1TH) Điều kiện tiên quyết/Môn học trước: khônG Mô tả môn học:

Khóa học này giúp sinh viên hiểu được các khả năng, kỹ thức và hậu quả của việc học sâu và chuẩn bị cho sinh viên tham gia phát triển công nghệ AI hàng đầu.

12.36. IT134IU - Internet vạn vật (Internet of Things, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: Mạng máy tính Mô tả môn học:

Môn học giải thích về kiến trúc, thành phần của mạng Internet vạn vật. Sinh viên sẽ được học về các kỹ thuật truyền thông khác nhau, từ tầm gần đến tầm xa như là Bluetooth, Zigbee, Wifi, LoRa, NB-IoT,... Ngoài ra, các kỹ thuật lưu trữ, tổ chức và phân tích dữ liệu còn được học trong môn học này. Sau đó, sinh viên sẽ được học các khái niệm, nguyên lý cơ bản và cấu tạo cơ bản của các hệ thống IoT cho các ứng dụng công nghiệp như y tế, sản xuất, nông nghiệp, v.v...

12.37. IT133IU - Phát triển ứng dụng di động (Mobile Application Development, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: Phân tích và thiết kế hướng đối tượng Mô tả môn học: Khóa học này được thiết kế nhằm giới thiệu và làm quen với sinh viên về lập trình trên môi trường di động: Nền tảng Android sẽ được sử dụng trong suốt khóa học. Khóa học bắt đầu với phần giới thiệu về các thành phần, khái niệm, cấu trúc cơ bản của ứng dụng Android sau đó tiếp tục với các thành phần giao diện người dùng phổ biến, lưu trữ liên tục, cơ sở dữ liệu cho thiết bị di động, v.v. Giới thiệu về hầu hết các công cụ và công cụ phổ biến kỹ thuật viết ứng dụng Android cũng được kèm theo bằng tay về kinh nghiệm dưới dạng dự án lập trình bài tập trong phòng thí nghiệm.

12.38. IT044IU - Tương tác người và máy (Human Computer Interaction, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH)
Điều kiện tiên quyết/Môn học trước: không
Mô tả môn học:
Môn học cung cấp cho sv các nguyên lý cơ bản trong tương tác giữa người và máy.

12.39. IT164IU – Điện toán đám mây (Cloud computing, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH)

Điều kiện tiên quyết/Môn học trước: Computer Network

Mô tả môn học:

Môn học tập trung vào kỹ thuật lập trình song song cho tính toán trên đám mây và hệ thống phân tán lớn. Các chủ đề được đề cập bao gồm tổng quan về điện toán đám mây, hệ thống đám mây, tính toán song song trên đám mây, hệ lưu trữ phân tán, ảo hóa, an toàn trên đám mây, và hệ điều hành đa nhân. Sinh viên sẽ được học các giải pháp hiện đại cho tính toán đám mây phát triển bởi Google, Amazon, Microsoft, Yahoo, VNWare và tương tự. Sinh viên sẽ được áp dụng các kiến thức vào các bài tập và đồ án thực hiện trên Amazon Web Services.

12.40. IT165IU – Công nghệ và Triển khai bảo mật (Security Technology and Implementation, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: Computer Network Mô tả môn học:

Môn học giới thiệu cho sinh viên nguyên lý của an toàn thông tin, hệ thống mật mã hóa (mã hóa đối xứng và mã hóa công cộng), quản lý rủi ro, an toàn cho kiến trúc và thiết kế, an toàn trong vận hành kinh doanh liên tục, kiểm soát truy cập, bảo vệ màng TCP/IP, tưởng lửa, mạng ảo, IPSec, an toàn trong phát triển phần mềm.

12.41. IT0IU – Kiểm tra chất lượng phần mềm (Software Quality Verification and Validation, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: không Mô tả môn học:

Môn học giới thiệu về kiểm tra, kiểm định và kiểm thử phần mềm. Các chiến thuật và kỹ

thuật cho kiểm thử phần mềm, và lên kế hoạch kiểm thử phần mềm cũng được giới thiệu.

12.42. IT167IU – Phát triển ứng dụng game (Game Application Development, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: Object-Oriented Programming Mô tả môn học:

Môn học giới thiệu các định lý và kinh nghiệm thực hành quá trình thiết kế trờ chơi và trải nghiệm trò chơi. Sinh viên sẽ được làm quen với phương pháp, khái niệm và các tài liệu được dùng trong thiết kế trò chơi. Chiến thuật thiết kế theo hướng qui trình và tập trung vào các mảng như tạo nhanh phiên bản mẫu, kiểm thử trò chơi, vòng lập thiết kế sử dụng cách tiếp cận tập trung vào người chơi.

12.43. IT150IU – Chuỗi khối (Blockchain, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: không Mô tả môn học:

Môn học này giới thiệu cho sinh viên nền tảng của công nghệ chuỗi khối và các ứng dụng của nó. Học sinh sẽ nghiên cứu các khái niệm và nguyên tắc blockchain hoạt động như thế nào. Khóa học này bao gồm các chủ đề liên quan đến không gian chuỗi khối. Khóa học bắt đầu với những điều cơ bản về chuỗi khối, mật mã, hiểu biết cơ bản về bitcoin. Sau đó, các ứng dụng của công nghệ blockchain được giới thiệu trong các lĩnh vực tài chính, y tế, chuỗi cung ứng, v.v. Một bức tranh hoàn chỉnh về hệ sinh thái xung quanh công nghệ blockchain và các xu hướng phát triển cũng được thảo luận.

12.44. IT156IU – Phát triển và vận hành liên tục (Development & Operation, môn tự chon)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: không Mô tả môn học:

Khóa học này là phần giới thiệu về DevOps nhằm giúp sinh viên hiểu các nguyên tắc và thực tiễn của nó. Các khái niệm và thuật ngữ chính sẽ được đề cập bằng các nghiên cứu điển hình, ví dụ và bài tập thực tế trong đời thực. Các công cụ phổ biến và phổ biến để đạt được mô hình DevOps cũng sẽ được giới thiệu.

12.45. IT138IU – Trực quan hóa dữ liệu (Data Science and Visualization, môn tự chọn)

Số tín chỉ: 4 (3LT+1TH) Điều kiện tiên quyết/Môn học trước: không Mô tả môn học:

Mục tiêu của khóa học này là giới thiệu cho sinh viên các nguyên tắc, phương pháp và kỹ thuật chính để phân tích dữ liệu trực quan một cách hiệu quả. Khóa học bắt đầu với mục tiêu và nguyên tắc chính của trực quan hóa dữ liệu. Khóa học tiếp tục với các khía cạnh khác nhau của trực quan hóa bao gồm các kỹ thuật và phương pháp trình bày các loại dữ

liệu khác nhau cũng như thảo luận và phân tích trực quan hóa. Xuyên suốt khóa học, học viên sẽ được làm quen với nhiều hệ thống trực quan và công cụ trực quan thông qua các bài tập thực hành.

12.46. PE008IU – Tư duy Phản biện (Critical Thinking, môn tự chọn)

Số tín chỉ: 3 (3LT+0TH) Điều kiện tiên quyết/Môn học trước: không Mô tả môn học:

Tư duy phê phán nghiên cứu một quá trình không thể thiếu đối với tất cả những người có học thức - quá trình chúng ta phát triển và ủng hộ niềm tin của mình cũng như đánh giá sức mạnh của những lập luận của người khác trong các tình huống thực tế. Nó bao gồm thực hành về lý luận quy nạp và suy diễn, trình bày các lập luận dưới dạng nói và viết và phân tích việc sử dụng ngôn ngữ để tác động đến suy nghĩ. Khóa học cũng áp dụng quy trình suy luận vào các lĩnh vực khác như kinh doanh, khoa học, luật, khoa học xã hội, đạo đức và nghệ thuật.

12.47. IT120IU - Khởi nghiệp (Entrepreneurship, môn tự chọn)

Số tín chỉ: 3 (3LT)

Điều kiện tiên quyết/Môn học trước: không

Mô tả môn học: Môn học cung cấp kiến thức về khởi tạo doanh nghiệp, tư duy sáng tạo để đưa ra sản phẩm, dịch vụ mới có liên quan đến công nghệ. Vai trò của doanh nghiệp trẻ trong nền kinh tế và cách quản lý doanh nghiệp để khơi nguồn ý tưởng sáng tạo trong nhóm làm việc. Xây dựng và biến ý tưởng kinh doanh thành hiện thực.

12.48. IT082IU - Thực tập Công nghiệp (Internship)

Số tín chỉ: 3 (0 LT+3TH)

Điều kiện tiên quyết/Môn học trước: sinh viên năm 3 trở lên

Mô tả môn học:

Môn học nhằm tạo điều kiện cho sinh viên có cơ hội tiếp xúc với môi trường thực tế, nhằm để giải quyết những vấn đề thực tiễn trong sản xuất, cuộc sống hàng ngày. Nội dung chủ yếu bao gồm: xây dựng và quản trị hệ thống thông tin bằng web hoặc ứng dụng; tin học hóa các công tác văn phòng, công việc hang ngày; thiết kế, cài đặt vận hành mạng máy tính cho các doanh nghiệp, tổ chức. Tìm hiểu và ứng dụng các công nghệ mới.

12.49. IT083IU- Thực tập tốt nghiệp (Special Study of the Field)

Số tín chỉ: 3 (0 LT+3TH)

Điều kiện tiên quyết/Môn học trước: đủ số tín chỉ theo quy định

Mô tả môn học:

Môn học nhằm hướng dẫn sinh viên đến việc tìm hiểu phương pháp giải quyết một vấn đề tổng hợp thực tế. Nội dung hướng dẫn chủ yếu bao gồm: phương pháp tiếp cận vấn đề, các bước trong quá trình tìm hiểu vấn đề, các phương pháp tìm hiểu những giải pháp, các bước hoạch định, đề xuất giải pháp cho vấn đề.

12.50. IT058IU - Luận văn tốt nghiệp (Thesis)

Số tín chỉ: 10 (0LT+10TH) Điều kiện tiên quyết/Môn học trước: Thực tập tốt nghiệp Mô tả môn học:

Đây là các đề tài có tính thực tiễn hoặc có tính khoa học cao, được thiết kế để bảo đảm sinh viên nắm và vận dụng được những kiến thức đã học trong chương trình. Sinh viên sẽ làm việc theo nhóm để thu thập yêu cầu, thiết kế, cài đặt và cung cấp giải pháp cho các vấn đề thực tế. Sinh viên có thể sử dụng mô hình thích hợp, phải tự quản lý chính đề án đố, theo các kỹ thuật quản lý đề án đã học. Kết quả của luận văn có thể là sản phẩm theo yêu cầu và các tài liệu liên quan.

12.51. IT168IU - Thực tập tốt nghiệp (Special Study of the Field 2, sinh viên lựa chọn nếu có GPA>= 70)

Số tín chỉ: 3 (0LT+3TH) Điều kiện tiên quyết/Môn học trước: Thực tập tốt nghiệp Mô tả môn học:

Khóa học nâng cao này được xây dựng dựa trên các khái niệm đã học trong khóa học "Nghiên cứu đặc biệt về lĩnh vực này" và hướng dẫn sinh viên thực hiện các nghiên cứu nâng cao hơn. Khóa học được thiết kế để phát triển kỹ năng nghiên cứu, phân tích và trình bày của sinh viên

TRƯỞNG KHOA

KT. HIỆU TRƯỞNG PHÓ HIỆU TRƯỞNG

Month

Nguyễn Văn Sinh

Đinh Đức Anh Vũ

PHŲ LỤC 1

NỘI DUNG ĐIỀU CHỈNH CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH KHOA HỌC MÁY TÍNH 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:

- Bỏ 10 môn bắt buộc như sau:

STT	Mã môn	Tên môn	Số tín chỉ	Ghi chú
01	PE008IU	Critical Thinking	3	Học kỳ II năm 1
02	CH011IU	Chemistry for Engineers	3	Học kỳ I năm 1
03	CH012IU	Chemistry Laboratory	1	Học kỳ I năm 1
04	IT131IU	Theoretical Models in Computing	4	Học kỳ I năm 2
05	IT067IU	Digital Logic Design	3	Học kỳ I năm 2
06	IT099IU	Digital Logic Design Laboratory	1	Học kỳ I năm 2
07	PH012IU	Physics 4	2	Học kỳ I năm 2
08	PH014IU	Physics 2	2	Học kỳ I năm 1
09	MA023IU	Calculus 3	4	Học kỳ I năm 2
10	IT158IU	UI Design and Evaluation	4	Trong danh sách môn tự chọn

2. Các môn học bổ sung vào chương trình đào tạo:

- Thêm 10 môn tự chọn như sau:

STT	Mã môn	Tên môn tiếng	Tên môn	Số tín	Ghi chú
		Việt		chỉ	
					Học kỳ II
01			Free elective	3	năm 3
02	IT044IU	Tương tác người và máy	Human Computer Interaction	4	Trong danh sách môn tự chọn
03	IT164IU	Điện toán đám mây	Cloud computing	4	Trong danh sách môn tự chọn

04	IT165IU	Công nghệ và Triển khai bảo mật	Security Technology and Implementation	4	Trong danh sách môn tự chọn
05	IT166IU	Kiểm tra chất lượng phần mềm	SoftwareQualityVerificationandValidation	4	Trong danh sách môn tự chọn
06	IT167IU	Phát triển ứng dụng game	Game Application Development	4	Trong danh sách môn tự chọn
07	IT150IU	Chuỗi khối	Blockchain	4	Trong danh sách môn tự chọn
08	IT156IU	Phát triển và vận hành liên tục	Development & Operation (DevOps)	4	Trong danh sách môn tự chọn
09	IT138IU	Trực quan hóa dữ liệu	Data Science and Visualization	4	Trong danh sách môn tự chọn
10	PE008IU	Tư Duy Phản Biện	Critical Thinking	3	Trong danh sách môn tự chọn

3. Các điều chỉnh khác: Không

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

Khoa sẽ rà soát số lượng sinh viên khóa cũ chưa hoàn thành các môn học bị loại bỏ để mở lớp. Đối với các môn học loại bỏ trong chương trình đào tạo, đã chuyển thành môn tự chọn trong chương trình đào tạo mới nên được tổ chức mở trong những năm tiếp theo cho đến hết sinh viên khóa cũ.

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

PHỤ LỤC 2: ĐỀ CƯƠNG CHI TIẾT CÁC MÔN HỌC

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

Course Name: Calculus 1

Course Code: MA001IU

Course designation	This course equips students with basic concepts of calculus: limits, continuity, differentiation, and integration. Applications of these concepts are extensively discussed.
Semester(s) in which the course is taught	1, 2
Person responsible for the course	Lectures of Department of Mathematics
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lectures, assignments
Workload (incl.	(Estimated) Total workload: 120
contact hours, self-study hours)	Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (lectures)
	Private study including examination preparation, specified in hours ¹ : 60
Credit points	4
Required and recommended prerequisites for joining the course	None

¹ 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	1. To provide students with the main ideas and techniques of calculus. These include limits, continuity, differentiation, and integration.								
	2. To introduc through pract business, and	2. To introduce practical applications of these ideas and techniques, through practical examples taken from many areas of engineering, business, and life sciences.							
	3. To develop skills in mathematical modelling and problem solving, ability to think logically, and adapt these skilss creatively to new situations								
Course learning	Upon the succ	cessful completion of this course students will be able to:							
outcomes	Competen cy level	Course learning outcome (CLO)							
	Knowledge	CLO1. Have basic knowledge of limits and derivatives (Program outcomes: a) CLO2. Have basic knowledge of definite/indefinite integrals (Program outcomes: a)							
	Skill	CLO3. Can compute often used limits, can define and compute derivatives (Program outcomes: a, j) CLO4. Can compute standard types of integrals. Use integrals in practical situations (Program outcomes: a, j)							
	Attitude	CLO5. Confident when dealing with derivatives and integrals. Comfortable with using derivatives and integrals in practical situations. (Program outcome: j, k)							

Content	The description of the contents should clearly indice of the content and the level. Weight: lecture session (4 hours)	ate the v	weighting		
	Topic	Weig ht	Lev		
	Functions and Graphs, Inverse Functions, Exponent and Logarithmic Functions	1	I, T		
	Parametric Curves, Limit. One-sided Limits, Laws Limits.	1	I, T		
	Evaluating Limits. The Squeeze Theorem. Continuity. The Intermediate Value Theorem	1	T, U		
	Tangent Lines and Velocity Problems. Rates of Change, Derivative.	1	T, U		
	Higher-Order Derivatives, Rules of Differentiation. Rates of Change in the Natural and Social Sciences	1	T, U		
	Implicit Differentiation, Differentiation of Inverse Functions,	1	T, U		
	Logarithmic Differentiation, Linear Approximations. Differentials.	1	T, U		
	Related Rates, Maxima and Minima. Critical Point, The Mean Value Theorem.	1	T, U		
	The First and Second Derivative Test, Concavity. Shapes of Curves, Curve Sketching	1	T, U		
	Indeterminate Forms and l'Hôpital's Rules, Maxima and Minima Problems, Newton's Method	1	T, U		
	Anti-derivatives and Indefinite Integrals, The Definite Integral	1	I, T		
	Properties of the Definite Integral. The Fundamental Theorem of Calculus, Integration by Substitution	1	I, T, U		
	Integration by Parts, Partial Fractions, Numerical Integration,	1	T, U		
	Improper Integrals, Areas between Curves Areas Enclosed by Parametric Curves	1	T, U		
	Volumes, Arc Length, Applications to Engineering, Economics and Science	1	T, U		
Examination forms	Written 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 points overall to pass this course.	e than 5	50/100		
Reading list	J. Stewart, Calculus, Thomson Learning, 7th edition	, 2012.			

Course Name: Introduction to Computing

1. General information This course introduces students to a broad knowledge of the Course computer science and information technology fields. Topics designation covered will include basic computer concepts, components of computer hardware and operating systems software as well as data and telecommunications systems. Students can use the knowledge they've gained to strengthen their future-oriented job. 1.3 Semester(s) in which the course is taught Person responsible Dr. Nguyen Trung Ky for the course English Language Relation to Compulsory curriculum Teaching methods Lecture, lesson, project, seminar. Total workload: 135 hours. Workload (incl. Contact hours: 45 hours (lecture). contact hours. Private study including examination preparation, specified in self-study hours) hours: 90 hours. Number of credits: 3 Credit points Lecture: 3 Laboratory: 0 None Required and recommended prerequisites for joining the course Course objectives This course is to provide fundamentals and basic concepts of computer science and engineering, basics of Computing such as basic concepts, models, trends in industry. Introduction to majors and curricula, career path of all majors in computing, career orientation, job requirements and career opportunities in industry are also included in this course. CLO1: Demonstrate an in-depth understanding of fundamental Course learning knowledge and history of computing, all career paths in outcomes computing and learning methodologies in university. CLO2: Describe basic hardware and software concepts and basic computing terminologies CLO3: Make a plan for his/her own future career and his/her works CLO4: Seek information from the Internet and manage his/her information. CLO5: Follow the discussions of instructors and classmates. Competency **Course learning outcome** level (CLO)

Course Code: IT064

		Knowledge	CLO1, CLO2.		
		Skill	CLO3, CLO4.		
		Attitude	CLO5.		_
Content	The de	escription of the con	tents should clearly indi	icate the	
	weight	ting of the content a	and the level.		
	Weigh	t: lecture session (3	hours)		
	Teach	ing levels: I (Introd	uce); T (Teach); U (Utili	ize)	
	Topic Weigh L t l				
	The C	Overall Picture		1	Ι
	Data	and Information		2	T, U
	Hard	ware		2	T, U
	Algo	rithm and Programr	ning Language	2	T, U
	Opera	ating System		2	T, U
	Netw	orking		2	T, U
	Infor	mation System and	Application	2	T, U
	Majo	rs and Curriculur	n, Career Paths and	1	Ι
	Orier	ntation Careers at a I	Hardware, Network and		
	Softw	vare Company			
	Revis	sion		1	
Examination forms	Multip	ble-choice questions	s, short-answer questions	5	
Study and	Attend	lance: A minimum	attendance of 80 percent	nt is com	pulsory
examination	for the	class sessions. Stud	dents will be assessed on	the basis	of their
requirements	class	participation. Qu	estions and comment	s are s	strongly
	Assign	nments/Examination	n: Students must have n	nore than	50/100
	points	overall to pass this	course.		
Reading list	[1] Ne	ell Dale and John L	ewis, "Computer science	ce: Illumi	nated",
	7th Edition, Jones & Bartlett Learning Publisher, ISBN-13 978-				
	12841	55617, 2019.	"Commutan Saianaan An	Our	
	Edition	n Pearson Publishe	r ISBN-13 978-013376	0064 201	W, 12
	[3] Pe	eter Wentworth. J	effrey Elkner. "How the	o Think	Like a
	Comp	uter Scientist: Lear	ning with Python 3 Doc	umentatio	on", 3rd
	Edition	n, Allen B. Downe	ey and Chris Meyers, (Green Te	a Press
	Publis	her, ISBN-13 978-0)971677500, 2020.		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6

1	Х		Х		
2	Х		Х		
3	Х				
4	Х				
5				Х	

3. Planned learning activities and teaching methods

Week	Торіс	CL O	Assessmen ts	Learning activities	Resource s
1	The Overall Picture	1		Lecture, Discussion	[1]. Chapter 1
2	Binary Values and Number System	1, 2	Quiz.	Lecture, In-class quiz	[1]. Chapter 2
3	Data Representation	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 3
4	Gates and Circuits	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 4
5	Computing Components	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 5
6	Low-level Programming Languages and Pseudocode	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 6
7	Midterm				
8	Problem Solving and Algorithm, Abstract Data Types and Subprograms	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 7,8
9	Object-oriented Design and High-level Programming Languages	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 9
10	Operating System and File System and Directory	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 10, 11
11	Information System, Artificial Intelligence	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 12, 13
12	Simulation, Graphics, Gaming, and Other Programming Networks	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 14, 15
13	The World Wide Web Computer Security	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 16, 17
14	Majors and Curriculum, Career Paths and Orientation, Careers at Hardware, Network and Software Company	3, 4		Lecture, Discussion	

15	Revision		Review-test	
16	Final exam			

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Quiz (10%)	25%	25%	33.3 %	33.3 %	25%
Midterm examination (30%)	25%	25%			25%
Projects/Presentations/ Report (20%)	25%	25%	33.3 %	33.3 %	25%
Final examination (40%)	25%	25%	33.3 %	33.3 %	25%

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

1. 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.↔

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports			
Student: HW/Assignment:			
Evaluator:	•••••		
Date:			
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and	10		
summarizes principal content			
Introduction demonstrates thorough knowledge of	15		
relevant background and prior work			
Analysis and discussion demonstrate good subject	30		
mastery			
Summary and conclusions appropriate and	5		
complete			
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good	5		
transitions			
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

Ho	Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW		
Sco	Description		
re			
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
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	
	critically is stated	to be considered	terms	
	clearly and	critically is	undefined,	Issue/
	described	stated,	ambiguities	problem to be
	comprehensively,	described, and	unexplored,	considered
	delivering all	clarified so that	boundaries	critically is
	relevant	understanding is	undetermined,	stated without
Explanati	information	not seriously	and/ or	clarification
on of	necessary for full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information is	Information is
Evidence	taken from	taken from	taken from	taken from
Selecting	source(s) with	source(s) with	source(s) with	source(s)
and using	enough	enough	some	without any
informatio	interpretation/	interpretation/	interpretation/	interpretation/
n to	evaluation to	evaluation to	evaluation, but	evaluation.
investigat	develop a	develop a	not enough to	Viewpoints of
e a point	comprehensive	coherent	develop a	experts are
of view or	analysis or	analysis or	coherent	taken as fact,
conclusio	synthesis.	synthesis.	analysis or	without
n	Viewpoints of	Viewpoints of	synthesis.	question.

	experts are questioned thoroughly.	experts are subject to questioning.	Viewpoints of experts are taken as		
			with little questioning.		
	Thoroughly (systematically and methodically) analyzes own and others' assumptions and	Identifies own and others'	Questions some assumptions. Identifies several relevant contexts when presenting a position. May	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to	
Influence	carefully evaluates	assumptions and	be more aware	identify some	
of context	the relevance of	several relevant	of others'	contexts	
anu assumnti	presenting a	presenting a	than one's own	nresenting a	
ons	position.	position.	(or vice versa).	position.	
	(perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective,	Specific position (perspective, thesis/hypothesi s) takes into account the complexities of			
	thesis/ hypothesis)	an issue. Others'	Specific	Specific	
Student's	are acknowledged.	points of view	position (perspective	position	
nosition	view are	acknowledged	thesis/	thesis/	
(perspecti	synthesized within	within position	hypothesis)	hypothesis) is	
ve,	position	(perspective,	acknowledges	stated, but is	
thesis/hyp	(perspective,	thesis/	different sides	simplistic and	
othesis)	thesis/ hypothesis).	hypothesis).	of an issue.	obvious.	
	Conclusions and related outcomes (consequences and implications) are	Conclusion is logically tied to a range of information,	Conclusion is logically tied to information (because	Conclusion is inconsistently tied to some of the	
Conclusio	logical and reflect	including	information is	information	
ns and related	student's informed	opposing	chosen to fit	aiscussed;	
	ability to place	viewpoints;	conclusion).		
(imnlicati	evidence and	outcomes	some related	(consequence	
ons and	perspectives	(consequences	outcomes	s and	
conseque	discussed in	and	(consequences	implications)	
nces)	priority order.	implications)	and are		

	are identified clearly.	implications) are identified clearly.	oversimplifie d.
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Source: Association of American Colleges and Universities

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is
	content of the	observable	observable	not observable
Organizat	presentation	within the	within the	within the
ion	cohesive.	presentation.	presentation.	presentation.
			Language	
	Language	Language	choices are	
	choices are	choices are	mundane and	Language
	imaginative,	thoughtful and	commonplace	choices are
	memorable, and	generally	and partially	unclear and
	compelling, and	support the	support the	minimally
	enhance the	effectiveness of	effectiveness of	support the
	effectiveness of	the	the	effectiveness of
	the presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
		Delivery		
	Delivery	techniques	Delivery	Deliverv
	techniques	(posture.	techniques	techniques
	(posture.	gesture, eve	(posture.	(posture.
	gesture, eve	contact, and	gesture, eve	gesture, eve
	contact, and	vocal	contact, and	contact, and
	vocal	expressiveness)	vocal	vocal
	expressiveness)	make the	expressiveness)	expressiveness)
	make the	presentation	make the	detract from the
	presentation	interesting and	presentation	understandabilit
	compelling and	speaker appears	understandable	v of the
Deliverv	sneaker annears	comfortable	and sneaker	presentation and
Denvery	speaker appears	connortable.	and speaker	presentation, and

Oral communication value rubric for evaluating presentation tasks:

	polished and		appears	speaker appears
	confident.		tentative.	uncomfortable.
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations from	quotations from	quotations from	statistics,
	relevant	relevant	relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation of	presentation of
	presenter's	presenter's	presenter's	presenter's
Supportin	credibility/	credibility/	credibility/	credibility/
σ	authority on the	authority on the	authority on the	authority on the
s Material	topic.	topic.	topic.	topic.
	Central message			
	is compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities **Date revised: February 15, 2022**

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Listening AE1

Course Code: EN008IU

1. General information

Course designation	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.
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Lecturers of Department of English
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours ² : 60
Credit points	2
Required and recommende d prerequisites for joining the course	 Students must fulfil ONE of the following requirements to attend this course: hold TOEFL iBT certificate with score ≥ 61 hold IELTS certificate with score ≥ 5.5 complete IE2 course

² 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	There are a number of objectives embedded in various teaching activities in Listening AE1 course:			
	Pre-listening activities: aim to activate students' current knowledge of the topic, and to provide them with lecture language and effective strategies in listening and note-taking to prepare themselves for the coming lecture. These activities include reading (this can be done before class meetings), discussing and reviewing what they have learned from the reading.			
	While-listening and post-listening activities: aim to enable students to put their newly activated knowledge and acquired strategies into work by taking notes on the lecture, using the outline given by the teacher or prepared by themselves. They are later on asked to assess their understanding based on their notes and discuss them with their classmates. Finally, as an optional activity, depending on time and students' needs, students are asked to summarize the lecture.			
	Follow-up activities: students are required to discuss the lecture topic and to prepare arguments for or against the topic in the debate. The purpose is to enhance students' comprehension of the lecture, and to allow them to put their acquired academic language into practice, and to experience the atmosphere of a university lecture class.			
Course	Upon the success	ful completion of this course, students will be able		
outcomes	Competency	Course learning outcome (CLO)		
outcomes	level	Course learning outcome (CLO)		
	Knowledge	CLO1. Remember different strategies and techniques in listening to academic lectures and taking notes. CLO2. Improve their specialized knowledge of academic lectures		
	Skill	CLO3. Respond to academic lectures with appropriate strategies		
		CLO4. Communicate effectively with their classmates and professors.		
	Attitude	CLO5. Respond to academic lectures with		
		confidence		

Content	The description of the contents should clearly indic of the content and the level.	cate the we	eighting
	Weight: lecture session (2 hours)		
	Teaching levels: I (Introduce); T (Teach); U (Utilize)		
	Торіс	Weigh t	Leve l
	Orientation & Introduction of strategies and techniques in note-taking	2	I, T, U
	Chapter 1: New Trends in Marketing Research	3	T, U
	Chapter 2: Business Ethics	3	T, U
	Chapter 3: Trends in Children's Media Use	2	T, U
	Chapter 4: The Changing Music Industry	2	T, U
	Chapter 5: The Placebo Effect	2	T, U
	Midterm Sample Test & Review	2	T, U
	Chapter 6: Intelligent Machines	3	T, U
	Chapter 7: Sibling Relationships	3	T, U
	Chapter 8: Multiple Intelligences	3	T, U
	Chapter 9: The Art of Graffiti	3	T, U
	Final Sample Test & Review	2	T, U
Examination forms	Paper and pen tests: Correct the mistakes, Fill in th short answers, Write a summary paragraph.	e blanks, '	Write
Study and examination requirements	AttendanceRegular on-time attendance in this course is expected. It iscompulsory that students attend atleast 80% of the course to beeligible for the final examination.Missed testsStudents are not allowed to miss any of the tests (both on-goingassessment and final test). There are very few exceptions. (Only withextremely reasonable excuses, e.g. certified paper from doctors, maystudents re-take the tests.)Class behaviorStudents are supposed to:prepare thoroughly for each class in accordance with the syllabusand complete allassignments upon the instructor's requestparticipate fully and constructively in all class activities (anddiscussions if any)display appropriate courtesy to all involved in the classprovide constructive feedback to faculty members regarding their		

Reading list	[1] Frazie, L., & Leeming, S. (2013). Lecture ready 3.
iteaanig not	Oxford: Oxford University Press.References:
[2] Frazie, L., & Leeming, S. (2013). <i>Lecture ready 1, 2</i> . Oxfor	
	Oxford University Press.

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:

	SLO						
CLO	1	2	3	4	5	6	
1							
2							
3							
4							

3. Planned learning activities and teaching methods

WEEK	P.	Chapter	Listening oriented activities	Speaking oriented
				activities
WEEK 1	2	ORIENTATION		
		Chapter 1	Recognizing topic	Expressing
WEEK 2		New	introducing and lecture	ideas duringa
	2	Trends in	plan presenting	discussion
		Marketing	expressions	
		Research	Organizing ideas by	
			outlining	
		<u>Chapter 2</u>	Recognizing transition	Asking for
WEEK 3		Business	expressions	clarification and
	2	Ethics	Using symbols and	elaboration
			abbreviations	during a
				discussion
WEEK 4	2	REVIEW		
		<u>Chapter 3</u>	Recognizing	Giving
WEEK 5	2	Trends in	generalization and	opinions
		Children's	support expressions	andasking
		Media Use		for opinions
				during a
				discussion
		Chapter 4	Recognizing	Expressing
WEEK 6		The Changing	expressions for	interest and
	2	MusicIndustry	clarification or	asking for
			emphasis Organizing	elaboration

			notes byusing a split-	during a
			page	discussion
			format	
		Chanter 5	Recognizing cause and	Agreeing and
WEEK 7	-	The Placebo	effect expressions	disagreeing
	2	Effect	Noting causes and	during a
			effects	discussion
		SAMPLE		
WEEK 8	C	TEST		
	Z	CORRECT		
		ION		
		WRAP-UP		
		AND		
		REVIEW		
		MID-TEF	RM EXAMINATION	
		Chapte	Recognizing	Learning to
WEEK 9		r 6	expressions used to	compromiseand
		Intellig	predict causes and	reach a
	2	ent	effects	consensus
	-	Machi	Using arrows to show	during a
		nes	the relationship between	discussion
			causes and	
			effects	
WFFK 10		REVIEW		
WEEK IU	2			
		<u>Chapter 7</u>	Recognizing	Expanding on
WEEK 11		Sibling	expressions of	ideas during a
	2	Relationsh	comparison and	discussion
		ips	contrast	
			Noting comparison and	
			contrast	
WEFIZ 14		<u>Chapter</u>	Recognizing non-verbal	Keeping the
WEEK 12		<u>8</u>	signals indicating	discussionon
	2	Multiple	important information	topic
		Intelligen	Representing information	
		ces	in list form	
WEEK 12	2	DEVIEW		
WEEK 13	2	KEVIEW		

WEEK 14	2	<u>Chapter 9</u> The Art of Graffiti	Recognizing expressions of definition Reviewing and practicing all note taking strategies	Indicating to other when preparing to speak or pausing to collect thoughts		
WEEK 15	2	WRAP-UP AND REVIEW				
FINAL EXAMINATION						

4.

5. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
On-going assessment (30%)	000/	000/	900/	200/	0.00/
(participation, individual work, group	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
work, assignments, etc.)	1 055	1 055	1 455	1 055	1 435
	80%		80%		
Midterm exam (30%)	Pass		Pass		
	80%		80%		
Final exam (40%)	Pass		Pass		

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

6. Rubrics (optional)

Date revised: 15 August, 2022

Ho Chi Minh City, 15 August 2022

Course Name: Physics 1

Course Code: PH013IU

1. General information

Course designation	This subject will provide an introduction to mechanics including: concepts and principles of kinetics, dynamics, energetics of motion of a particle and a rigid body.					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	Assoc. Prof. Phan Bảo Ngọc Dr. Phan Hiền Vũ					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, assignment.					
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 90 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): lecture: 30					
	Private study including examination preparation, specified in hours ³ : 60					
Credit points	2					
Required and recommended prerequisites for joining the course	None					
Course objectives	 This course will provide students with: The basic knowledge of general Mechanics Physics Skills to solve problems in engineering environment by applying both theoretical and experimental techniques Understanding and skills needed to use physical laws governing real process and to solve them in the engineering environment Confidence and fluency in discussing physics in English. 					

³ 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 learning Upon the successful completion of this course studen								
outcomes	able to:							
	Competency level	Course learning outcome	(CLO)					
	Knowledge	CLO1. An ability to u	nderstand	l of bas				
		conserva	ations a					
		dynamics of rigid body.						
		CLO2. An ability to ana	lysis an	d design				
		problem in science and engineering						
	Skill	CLO3. An ability in application physics	lying kno	owledge				
	Attitude	CLO4. An ability to commu	unicate ef	fectively				
		writing manner						
ContentThe description of the contents should clearly weighting of the content and the level.				е				
	Weight: lecture session (2 hours)							
	Teaching levels: I (Introduce); T (Teach); U (Utilize)							
	Торіс	Weig ht	Lev el					
	Chapter 1: Bases of	2	I, T					
	Chapter 2: The La	2	I, T					
	Chapter 3: Work a	3	I, T					
	Chapter 4: Linear	2	I, T					
	Chapter 5: Rotatic a Fixed Axis	2	I, T					
	Chapter 6: Equilib	prium and Elasticity	2	I, T				
	Chapter 7: Univer	2	Ι, Τ					
Examination forms	Short-answer quest	tions						
Study and examination requirements	Study and examinationAttendance: A minimum attendance of 80 percent is con for the class sessions. Students will be assessed on the ba their class participation. Questions and comments are str encouraged.							
	Assignments/Examination: Students must have more than 50/100 points overall to pass this course.							

Reading list	[1] Halliday D., Resnick R. and Walker, J. (2011) <i>Fundamentals of Physics</i> , 9 th edition, John Willey and Sons, Inc.
	[2] Alonso M. and Finn E.J. (1992) <i>Physics,</i> Addison-Wesley Publishing Company.
	[3] Hecht, E. (2000) <i>Physics: Calculus</i> , 2 nd edition, Brooks/Cole.
	[4] Faughn/Serway (2006) Serway's College Physics, Thomson Brooks/Cole.

1. 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:

		PLO								
CLO	1	2	3	4	5	6	7	8	9	10
1	X									
2	X									
3										
4										

2. Planned learning activities and teaching methods

Wee		CL	Assessmen	Learning	Resource
k	Торіс	0	ts	activities	S
				Lecture,	
	Chapter 1: Bases of			Discussion,	[1].0.
1-2	Kinematics	1	Quiz1	Inclass-Quiz	[2].1.
				Lecture,	
	Chapter 2: The Law of			Inclass,	
3-4	Motion	1	HW1	HW	[1].9.
				Lecture,	
	Chapter 3: Work and			Discussion,	
5-6-7	Mechanical Energy	3	Quiz2	Inclass-Quiz	[2].2.
				Lecture,	
	Chapter 4: Linear Momentum		HW2,	Group work,	[1]. 2, 4
8-9	and Collisions	2	Quiz3	HW	[2]. 2
10	Midterm				
				Lecture,	
11-	Chapter 5: Rotation of a Rigid			Group work,	[2]. 4.
12	Object About a Fixed Axis	3	HW3	HW	[1]. 18.
13-	Chapter 6: Equilibrium and			Lecture,	
14	Elasticity	3		Group work	[3]. 10
	-			Lecture,	
15-	Chapter 7: Universal			Discussion,	
16	Gravitation	3	HW4	HW	[2]. 8
17	Final exam				

3. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Attendance +				
Homework + in-				
class discussion				
(15%)				
			Qz1, Qz2,	Qz1, Qz2,
Quizzes (Qz) /	Qz1, Qz3/	Qz2, Qz4/	Qz3, Qz4 /	Qz3, Qz4 /
assignment (As)	As.P1	As.P2	As.P3	As.P4
(15%)	50%Pass	50%Pass	50%Pass	50%Pass
Midterm exam	Q1, Q2, Q3	Q4, Q5	Q3, Q5	Q3, Q5
(30%)	50%Pass	50%Pass	50%Pass	50%Pass
	Q1, Q2, Q3	Q4, Q5	Q3, Q5	Q3, Q5
Final exam (40%)	50%Pass	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	10							
content								
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							
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
	4 Issue/ problem to be considered critically is stated clearly and described comprehensively , delivering all relevant information	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined	I Issue/ problem to be considered critically is
F le	necessary for	not seriously	, and/ or	stated without
Explanation of	Iuli	impeded by	backgrounds	clarification
	Information is taken from source(s) with	Information is taken from	Information is taken from source(s) with some interpretation	
	enough interpretation/ evaluation to develop a comprehensive	source(s) with enough interpretation/ evaluation to develop a	/ evaluation, but not enough to develop a coherent	Information is taken from source(s) without any interpretation/
Evidence	analysis or	coherent analysis	analysis or	evaluation.
Selecting and	synthesis.	or synthesis.	synthesis.	Viewpoints of
using information	Viewpoints of	Viewpoints of	Viewpoints	experts are
to investigate a	experts are	experts are	of experts are	taken as fact,
point of view or	questioned	subject to	taken as	without
conclusion	thoroughly.	questioning.	mostly fact,	question.

			with little	
			questioning.	
			Questions	
			some	
			assumptions	
			Identifies	Shows an
	Thoroughly		several	emerging
	(systematically		relevant	awareness of
	and		contexts	present
	methodically)		when	assumptions
	analyzes own		presenting a	(sometimes
	and others'		position. May	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions).
	evaluates the	assumptions and	others'	Begins to
T A	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
context and	presenting a	presenting a	own (or vice	presenting a
	position.	position.	versa).	position.
	(perspective			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	account the			
	complexities of	Specific position		
	an issue. Limits	(perspective,		
	of position	thesis/hypothesis		
	(perspective,) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
Studor 41	view are	are	thesis/	(perspective,
Student's	synthesized	within position	nypotnesis)	hypothesis) is
pusitiuli (nerspective	(nerspective	(nerspective	s different	stated but is
thesis/hynothesis	thesis/	thesis/	sides of an	simplistic and
)	hypothesis)	hypothesis)	issue	obvious
	Conclusions and	Conclusion is	Conclusion is	Conclusion is
Conclusions and	related outcomes	logically tied to	logically tied	inconsistently
related outcomes	(consequences	a range of	to	tied to some
(implications	and	information,	information	of the
and	implications) are	including	(because	information
consequences)	logical and	opposing	information is	discussed;

reflect st informed evaluation ability to evidence perspection discussed	udent's viewport related on and (conset place and and implic ves identif d in clearly	oints; cl l outcomes th equences co ations) are ou fied (co 7. s	chosen to fit he desired conclusion); ome related outcomes consequence and	related outcomes (consequences and implications) are oversimplified
discussed priority of	l in clearly order.	7. s ir an cl	and mplications) are identified elearly.	oversimplified .

Oral communication value rubric for evaluating presentation tasks:	Source: Association of American Colleges and Universities
	Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizationa			
	l pattern			
	(specific			
	introduction	Organizationa		
	and	l pattern	Organizational	
	conclusion,	(specific	pattern	
	sequenced	introduction	(specific	
	material	and	introduction	
	within the	conclusion,	and	Organizational
	body, and	sequenced	conclusion,	pattern (specific
	transitions) is	material	sequenced	introduction
	clearly and	within the	material	and conclusion,
	consistently	body, and	within the	sequenced
	observable	transitions) is	body, and	material within
	and is skillful	clearly and	transitions) is	the body, and
	and makes the	consistently	intermittently	transitions) is
	content of the	observable	observable	not observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language			
	choices are			
	imaginative,		Language	
	memorable,	Language	choices are	Language
	and	choices are	mundane and	choices are
	compelling,	thoughtful and	commonplace	unclear and
	and enhance	generally	and partially	minimally
	the	support the	support the	support the
	effectiveness	effectiveness	effectiveness	effectiveness of
	of the	of the	of the	the
	presentation.	presentation.	presentation.	presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.

	Delivery			Delivery
	techniques	Deliverv	Deliverv	techniques
	(posture.	techniques	techniques	(posture.
	gesture, eve	(posture.	(posture.	gesture, eve
	contact, and	gesture, eve	gesture, eve	contact, and
	vocal	contact and	contact and	vocal
	expressivenes	vocal	vocal	expressiveness)
	s) make the	expressivenes	evnressiveness	detract from the
	nresentation	s) make the) make the	understandabilit
	compelling	presentation	presentation	v of the
	and speaker	interesting	understandabl	presentation
	and speaker	and speaker	e and sneaker	and speaker
	appears	and speaker	annears	and speaker
Dolivory	confident	comfortable	tentative	uncomfortable
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations	(explanations	(explanations	supporting
	examples	examples	examples	materials
	illustrations	illustrations	illustrations	(explanations
	statistics	statistics	statistics	examples
	analogies	analogies	analogies	illustrations
	analogics,	analogics,	analogics,	statistics
	from relevant	from relevant	from relevant	analogies
	authorities)	authorities)	authorities)	analogics,
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information
	analysis that	analysis that	analysis that	or analysis that
	significantly	generally	nartially	minimally
	supports the	supports the	supports the	supports the
	presentation	nresentation	presentation	presentation or
	or establishes	or establishes	or establishes	establishes the
	the presenter's	the presenter's	the presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic.	the topic.	the topic.	topic.
	Central			
	message is			
	compelling		Central	
	(precisely	Central	message is	
	stated.	message is	basically	Central
	appropriately	clear and	understandabl	message can be
	repeated.	consistent	e but is not	deduced but is
	memorable.	with the	often repeated	not explicitly
	and strongly	supporting	and is not	stated in the
Central Message	supported.)	material.	memorable.	presentation.

Source: Association of American Colleges and Universities 6. Date revised: January 12, 2022

Course Name: Writing AE1

Course Code: EN007IU

1. General information

Course designation	This course provides students with comprehensive instructions and practice in essay writing, including transforming ideas into different functions of writing such as process, cause-effect, comparison-contrast, and argumentative essays.				
Semester(s) in which the course is taught	1, 2, 3				
Person responsible for the course	Lecturers of Department of English				
Language	English				
Relation to curriculum	Compulsory				
Teaching methods	Lecture, lesson, project				
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours ⁴ : 60				
Credit points	2				
Required and recommende d prerequisites for joining the course	 Students must fulfil ONE of the following requirements to attend this course: hold TOEFL iBT certificate with score ≥ 61 hold IELTS certificate with score ≥ 5.5 have completed IE2 course 				
Course objectives	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, paraphrasing, idea developing, revising, and editing, this course prepares the students for research paper writing in the next level of AE2 writing.				

⁴ 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	Upon the successful completion of this course, students will be able					
learning	to:		O)			
outcomes	level					
	Knowledge	CLO1. Understand and follow different steps in				
	the writing process to produce a complete es					
		nods to i	mprove			
		their writing such as peer feed comments	back and	teacher		
	Skill	CLO3. Read critically, analyze	and anno	otate an		
		CLO4. Use different function	is of wri	ting to		
		successfully communicate their	purposes	s to the		
		audience (describe a process, d	iscuss the	causes		
		and effects, compare and	contrast,	make		
		arguments, paraphrase and sum	narize)			
	Attitude	CLO5. Reason around ethical	issues in	writing		
		academic essays and avo	oid com	mitting		
Content	The description of the content and	f the contents should clearly indic	ate the we	eighting		
	Weight: lecture s	ession (2 hours)				
	Teaching levels: I (Introduce): T (Teach): II (IItilize)					
				Lava		
	Горіс		t veign	Leve 1		
	The process of A	1	I, T, U			
	Using Outside S	3	T, U			
	From Paragraph	4	T, U			
	Process Essays	4	T, U			
	Cause/Effect Es	says	4	T, U		
	Comparison/ Contrast Essays			T, U		
	Argumentative Essays		6	T, U		
	Summarizing		2	U		
Review & Correction			2	U		
Examination forms	Essay writing					
Study and	Attendance					
examination Regular on-time attendance in this course is expected. A			student			
•	iteguiai on thirt			stadem		

	the students attend at least 80% of the course to be eligible for the final examination.
	<i>Missed Tests</i> Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may re-take the examination.
	 Class Behaviors Students are required to treat their studying in college as a full-time job and spend an adequate amount of time for this Writing AE1 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below: Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request. Participate fully and constructively in all course activities and discussions (if any). Display appropriate courtesy to all involved in the class. Provide constructive feedback to faculty members regarding their performance.
	<i>Plagiarism</i> Students are warned not to copy from other books or from their peers for all assessment tasks. Committing plagiarism will result in 0 point for the task. Students who plagiarize twice will be prohibited from sitting the final examination.
	<i>Writing Center (Room 509)</i> Students are encouraged to visit the Writing Center to schedule an appointment for additional help with essay writing.
Reading list	[1] Oshima, A., & Hogue, A. (2017). Longman Academic Writing Series, Level 4: Essays (5 th ed.).New Jersey, NJ: Pearson Longman.
	 [2] Oshima, A., & Hogue, A. (2006). Longman Academic Writing Series, Level 4: Essays (4th ed.).New Jersey, NJ: Pearson Longman.

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:

	SLO					
CLO	1	2	3	4	5	6
1						
2						
3						
4						

3. Planned learning activities and teaching methods

	Coursebook		Homework	
Week	Chapter	Pages		
1	The process of Academic Writing Step 1: Creating (Prewriting) Step 2: Planning (Outlining) Step 3: Writing	[2] pp. 265- 279 [1] pp. 58- 65	 Do revising & editing exercises Read pp. [1] pp. 66-72 	
2	Using Outside Sources (Cont'd) Strategies for writing a successful summary	[1] pp. 58 - 72	 Do paraphrasing exercises Read [1] pp.74-100. Read, take notes and write the summary of ONE of the following articles: The Challenge of Many Languages (p. 280) Nice by Nature? (p. 281) Marital Exchanges (pp. 283-4) Why We Should Send a Manned Mission to Mars (pp.286-7) Let's Not Go to Mars (pp. 288-9) 	

	Review/	[1] pp. 74	•	Read pp. 101-15
	Correction.	-100	•	Do exercises on:
	L'ecturergives	100	•	• Writing thesis statements
	feedback to one			• Writing topic sentences from the
	recuback to one			o writing topic sentences nontine
	or two students			thesis statement provided
	writings in class.			• Writing restatements
	From Paragraph to			
	Essay			
	The introductory			
	paragraph:			
	• General			
	statements			
	&			
	Introductor			
	V			
	y			
	Therein			
3 & 4	• Thesis			
	statements &			
	Logical			
	division of			
	ideas			
	Body paragraphs:			
	 Topic sentences 			
	The concluding			
	paragraph:			
	• Restatement			
	●F			
	inal			
	thoug			
	hts			
	Outli			
	ouun			
	nes or			
	essay			
	S	F17		W/ 1 / (150.000 1)
	Process	[1] pp.	•	write a short essay (150-200words)
	Essays	101		describing how hydroelectric power
	Introduc	- 115		is generated (or a topic of the
	tion			lecturer's choice)
	Analyzi			
	ng the			
5	models			
3	Thesis			
	statements for			
	process essavs			
	Transitional signals			
	Write together.			
	Writing from a			
	diagram (n. 115)			
	ulagram (p.115)			

	Process Essays	[1] pp.	• Read [1] pp. 116-132
	(Cont'd) Review/	101	
	Correction:	- 115	
	Lecturer gives		
	feedback to one		
	or two students'		
	writings in class.		
	In-class Assignment:		
	Write a process essay		
	about one of these		
	topics or a topic of		
	the lecturer's choice:		
	• How to cook a		
	favorite food		
6	• How to do a		
	favorite hobby		
	• How to succeed		
	in your major		
	area or		
	professional		
	field		
	• How to		
	accomplish an		
	academic task		
	(register for		
	classes, apply for		
	a scholarship,		
	pass an exam,		
	etc.)		
	Cause/	[1] pp.	• Practice 4, 5,6 /pp. 127-9
	Effect	116	• Write the introduction, ONE body
	Essays	- 132	paragraph and the conclusion on one of
	Introduct		the topics below or a topic of the
	ion		lecturer's choice. The topic should be
7	Analyzin		different from the one that has been

g the	used in class:
models	\circ The cause of obesity
Organiza	• The effects of involvement insports
tion	on young children
Signal words and	\circ The causes of stress in
phrases	college students
Write together:	o The effects of regular readingon
Write the	students' lives
introduction, ONE	
bodyparagraph and	
the conclusion on	
one of the topics	
below or a topic of	
the lecturer's choice:	
• The cause of	
obesity	
• The effects of	
involvement in	
sports on young	
children	
• The causes of	
stress in college	
students	
• The effects of	
regular reading	
on students' lives	

	Come / Effe of		
	Cause/ Effect		• Give peer-feedback using therubric
	Essays (Cont'd)		provided
	Review/		
	Correction:		
	Lecturer gives		
	feedback to one or		
	two students'		
	writings in class.		
	In-class Writing:		
	Write the		
	introduction, ONE		
	bodyparagraph and		
	the conclusion on		
	one of the two topics		
	left (except for the		
	ones that has been		
o	userbad on in alage		
0	worked on in class		
	and assigned as		
	nomework) or a		
	topic of the		
	lecturer's choice:		
	• The cause of		
	obesity		
	• The effects of		
	involvement in		
	sports on young		
	children		
	• The causes of		
	stress in college		
	students		
	The effects of regular		
	reading on		
	students' lives		
	students nves	MID	TFRM
		EXAMI	NATION
	Comparison/	[1] pp.	• Practice 3, 4, 6, 7/pp.142-6
	Contrast Essays	133	• Write the introduction. ONE body
	Introduc	- 151	paragraph and the conclusion on one of
	tion	101	the topics below or a topic of the
	Δnalvzi		lecturer's choice. The topic should be
	ng the		different from the one that has been
	modela		uncient nom the one that has been
	Organiz		used in class:
	Organiz		o Compare and contrast the
6	ation:		relationship between parents
9	Points of		and children in two different

comparison	cultures.
• Point-by-point	• Compare and contrast the
organization	university culture in two different
• Block	countries.
organization	• Compare and contrast the culture
Comparison and	of a small town and abig city.
Contrast signal	
words	
Write together:	
Write the	
introduction, ONE	
bodyparagraph and	
the conclusion on	
one of the topics	
below or a topic of	
the lecturer's choice:	
• Compare and	
contrast the	
relationship	
between parents	
and children in	
two different	
cultures.	
Compare	
and contrast	
theuniversity	
culture in	
two different	
countries.	
• Compare and	
contrast the	
culture of a	
small town and	
a	
big city.	

	Comparison /	[1] pp.	• Read [1] pp. 152-168
	Contrast Essays	133	
	(Cont'd)	- 151	
	Review/	-	
	Correction:		
	Lecturergives		
	feedback to one		
	or two students'		
	writings in class.		
	In-class Assignment:		
	Write a compare and		
	contrast essay on the		
	topic left or a topic		
	of the lecturer's		
	shoises		
	Compare and		
	• Compare and		
10	contrast the		
	hetween nerente		
	between parents		
	and children in		
	two different		
	cultures		
	• Compare		
	and contrast		
	theuniversity		
	cultures in		
	two different		
	countries		
	• Compare and		
	contrast the		
	cultures of a		
	small town and		
	a		
	big city		
	Argumentative	[1]	• Write an argumentative essay
	Essays	pp.	(300 - 350 words) on ONE of the
11 &	Introdu	152-	following topics or a topic
12	ction	168	
14	Analyzi		
	ng the		
	model		

Organization:		of the lecturer's choice:
Block vs. Point-by-		 Can same-sex parenting
point pattern		negatively influence a child's
The elements of an		mentality?
argumentativeessay:		\circ Do famous artists have an innate
• An explanation		talent, or do they put ingreat effort to
of the issue		improve their skills?
• A clear thesis		\circ Is homework helpful?
statement		
A summary of		
the opposing		
arguments		
Rebuttals to		
the opposing		
arguments		
• Vour		
• 1 Our		
The		
introductory		
naragraph:		
Thesis		
Statement		
Statistics as support		
Write together:		
Write the		
introduction ONE		
hadynaragraph and		
the conclusion on		
one of the topics		
below or a topic of		
the lecturer's choice		
Can same		
sca		
parenting		
influence a		
child's		
mentality?		
• Do famous		
• Do faillous		
artists nave		
talant or do		
those part in		
mey put in		
great erfort		
to improve		
• IS NOMEWORK		
nemtui?	1	

13	Argumentative Essays (Cont'd) Review/ Correction: Lecturer gives feedback to one or two students' writings in class. In-class Writing: Write an argumentative essay onthe topic left or a topic of the lecturer's choice: • Can same-sex parenting negativel y influence achild's mentalit y? • Do famous artists have aninnate talent, or do they put in great effort to improve their skills? • Is homework		 Give peer-feedback using therubric provided 			
14	Review & Practice: Summarizing		Sample final test			
15	Review/Correction : Lecturer gives feedback to one or two students' argumentative essays +sample final test in class. Lecturer has students check their own assignment scores.	FIT	VAL			
	EXAMINATION					

Course Name: C/C++ Programming

Course Code: IT116IU

Course designation	Lea	rning the basics of prog	gramming			
Semester(s) in which the course is taught	2					
Person responsible for the course	MSc. Le Thanh Son					
Language	Eng	glish				
Relation to curriculum	Cor	npulsory (CS, NE, CE)				
Teaching methods	Lec	ture				
Workload (incl. contact hours, self- study hours)	(Est Cor Priv hou	timated) Total workload ntact hours: 45 (lecture) vate study including exa rs: 120	d: 195 + 30 (laboratory) amination preparation, specified in			
Credit points	Number of credits: 4 Lecture: 3					
Required and recommended prerequisites for joining the course	None					
Course objectives	This course concentrates on learning the basics of programming languages which are the foundations for further studies in IT. The course enables students to get familiar with C programming language. The course covers all basic C data structures, control flows, simple data structures as well as other advanced topics which include pointers, bit operators, file processing, dynamic data turner					
Course learning outcomes	CLO 1. Understand programming languages and applications, how applications work CLO 2. Understand basic data structure and control flow of C programming language CLO 3. Able to write applications using C					
	Competency level Course learning outcome (CLO)					
		Knowledge 1				
	Skill 2, 3					
	Attitude					
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)					

1. General information

	Торіс	Weigh t	Level		
	Introduction to Computer and Programming Language	1	Ι		
	Introduction to C Programming Language	1	I, T		
	C Basic Data Types	1	T, U		
	Control Flow: Branching statements	1	T, U		
	Control Flow: Iteration	1	T, U		
	Functions	1	T, U		
	Array	1	T, U		
	Pointers	1	T, U		
	String	1	T, U		
	File Processing	1	T, U		
	Dynamic Memory Allocation	1	T, U		
	Struct, Union	1	T, U		
	Bitwise Operation		T, U		
	Linked list, Stack, Queue	1	T, U		
	Binary tree	1	T, U		
Examination forms	Short-answer questions, Programming exercises				
Study and	Attendance: A minimum attendance of 80 percent is				
examination	compulsory for the class sessions. Students will be assessed on				
requirements	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. Paul Deitel, C How to Program 8th, 201	.6			

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO\SL OT	1	2	3	4	5	6
1	Х					
2		XXX				
3		XXX				

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessment	Learning	Resource
			S	activities	S
1	Introduction to Computer and Programming Language	1	Quiz	Lecture	1
2	Introduction to C Programming Language	1	Quiz	Lecture	1

3	C Basic Data Types	1	Quiz	Lecture	1
4	Control Flow: Branching	2, 3	Quiz, Lab,	Lecture,	1
	statements		Midterm	Discussion	
				, In-class	
				Exercise	
5	Control Flow: Iteration	2,3	Ouiz, Lab,	Lecture,	1
0		<i>,</i>	Midterm	Discussion	
				, In-class	
				Exercise	
6	Functions	2.3	Ouiz, Lab.	Lecture.	1
0	1 unetions	_, _	Midterm	Discussion	
				. In-class	
				Exercise	
7	Arroy	23	Quiz Lab	Lecture	1
/	Allay	2, 3	Midterm	Discussion	1
			Wildterin	In-class	
				Exercise	
0	Deintens	23	Quiz Lab	Lecture	1
0	ronners	2, 5	Midterm	Discussion	1
			Wildterin	In_class	
				Fyereise	
N.T. 14				Exercise	
Midter	m T			-	
9	String	2, 3	Quiz, Lab,	Lecture,	1
			Final	Discussion	
				, In-class	
				Exercise	
10	File Processing	2, 3	Quiz, Lab,	Lecture,	1
			Final	Discussion	
				, In-class	
				Exercise	
11	Dynamic Memory Allocation	2, 3	Quiz, Lab,	Lecture,	1
			Final	Discussion	
				, In-class	
				Exercise	
12	Struct, Union	2, 3	Quiz, Lab,	Lecture,	1
			Final	Discussion	
				, In-class	
				Exercise	
13	Bitwise Operation	2, 3	Quiz, Lab,	Lecture,	1
			Final	Discussion	
				, In-class	
				Exercise	
14	Linked list, Stack, Oueue	2, 3	Quiz, Lab,	Lecture,	1
			Final	Discussion	
				, In-class	
				Exercise	
15	Binary tree	2, 3	Quiz, Lab.	Lecture.	1
			Final	Discussion	
			1 11101	, In-class	
				Exercise	

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Final

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz / Assigment (10%)	50%	10%	10%
Labs (20%)	10%	30%	30%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	10%	30%	30%

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	10				
principal content					
Introduction demonstrates thorough knowledge of	15				
relevant background and prior work					
Analysis and discussion demonstrate good subject	30				
mastery					
Summary and conclusions appropriate and complete	5				
Organization (10%)					
Distinct introduction, body, conclusions	5				
Content clearly and logically organized, good	5				
transitions					
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

Ho	Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW				
Scor	Description				
e					
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.				

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 rubrio	c for	evaluating	questions i	n exams:
0			·		1	

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

	contexts when		position. May	assumptions).
	presenting a		be more aware	Begins to
	position.		of others'	identify some
	•		assumptions	contexts
			than one's own	when
			(or vice versa).	presenting a
				position.
	Specific position			1
	(perspective,			
	thesis/ hypothesis)	Specific		
	is imaginative,	position		
	taking into account	(perspective,		
	the complexities of	thesis/hypothesi		
	an issue. Limits of	s) takes into		
	position	account the		
	(perspective,	complexities of		
	thesis/ hypothesis)	an issue. Others'	Specific	Specific
	are acknowledged.	points of view	position	position
Student's	Others' points of	are	(perspective,	(perspective,
position	view are	acknowledged	thesis/	thesis/
(perspective	synthesized within	within position	hypothesis)	hypothesis) is
,	position	(perspective,	acknowledges	stated, but is
thesis/hypot	(perspective,	thesis/	different sides	simplistic and
hesis)	thesis/ hypothesis).	hypothesis).	of an issue.	obvious.
			Conclusion is	
		Conclusion is	logically tied	Conclusion is
		logically tied to	to information	inconsistently
	Conclusions and	a range of	(because	tied to some
	related outcomes	information,	information is	of the
	(consequences and	including	chosen to fit	information
	implications) are	opposing	the desired	discussed;
	logical and reflect	viewpoints;	conclusion);	related
Conclusions	student's informed	related	some related	outcomes
and related	evaluation and	outcomes	outcomes	(consequence
outcomes	ability to place	(consequences	(consequences	s and
(implication	evidence and	and	and	implications)
s and	perspectives	implications)	implications)	are
consequence	discussed in	are identified	are identified	oversimplifie
s)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities

Oral communication value rubri	for evaluating	presentation tasks:
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	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational	Organizational	Organizational	Organizational
	pattern (specific	pattern	pattern	pattern (specific
	introduction and	(specific	(specific	introduction and
	conclusion,	introduction	introduction	conclusion,
	sequenced	and conclusion,	and conclusion,	sequenced
Organizatio	material within	sequenced	sequenced	material within
n	the body, and	material within	material within	the body, and

	transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	the body, and transitions) is clearly and consistently observable within the presentation.	the body, and transitions) is intermittently observable within the presentation.	transitions) is not observable within the presentation.
			Language	
	Language	Language	choices are	-
	choices are	choices are	mundane and	Language
	imaginative,	thoughtful and	commonplace	choices are
	memorable, and	generally	and partially	unclear and
	compelling, and	support the	support the	minimally
	ennance the	the	the	support the
	the presentation	nresentation	nresentation	the presentation
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
	Delivery		Delivery	Delivery
	techniques	Delivery	techniques	techniques
	(posture,	techniques	(posture,	(posture,
	gesture, eye	(posture,	gesture, eye	gesture, eye
	contact, and	gesture, eye	contact, and	contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandabilit
	compelling, and	presentation	understandable,	y of the
	speaker appears	interesting, and	and speaker	presentation, and
Dolivory	polished and	speaker appears	appears	speaker appears
Denvery	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations	(explanations	materials
	materials	examples.	examples.	(explanations.
	(explanations,	illustrations,	illustrations,	examples,
	examples,	statistics,	statistics,	illustrations,
	illustrations,	analogies,	analogies,	statistics,
	statistics,	quotations from	quotations from	analogies,
	analogies,	relevant	relevant	quotations from
	quotations from	authorities)	authorities)	relevant
	relevant	make	make	authorities)
	authorities)	appropriate	appropriate	make reference
	make	reterence to	reference to	to information or
G	appropriate	information or	information or	analysis that
Supporting	information or	analysis that	analysis that	minimally
wiaterial	miorination of	generally	parnally	supports the

	analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	supports the presentation or establishes the presenter's credibility/ authority on the topic.	supports the presentation or establishes the presenter's credibility/ authority on the topic.	presentation or establishes the presenter's credibility/ authority on the topic.
	Central message is compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Physics 3

Course Code: PH015IU

1. General information

Course designation	This subject will provide a basic knowledge of electricity and magnetism.			
Semester(s) in which the course is taught	1, 2			
Person responsible for the course	Assoc. Prof. Phan Bảo Ngọc			
Language	English			
Relation to curriculum	Compulsory			
Teaching methods	Lecture, lesson, assignment.			
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 135 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): lecture: 45 Private study including examination preparation, specified in hours: 90			
Credit points	3			
Required and recommended prerequisites for joining the course	Physics 1			
Course objectives	 This course will provide students with: The basic knowledge of electricity and magnetism such as electric charge, electric potential, magnetic fields, electromagnetic waves, etc. Skills to solve problems in engineering environment by applying both theoretical and experimental techniques. Understanding and skills needed to use physical laws governing real process and to solve them in the engineering environment. Confidence and fluency in discussing physics in English. 			

Course learning	ing Upon the successful completion of this course students will be able to:					
	Competency level	hpetency Course learning outcome (CLO)				
	Knowledge	CLO1. An ability to understand basic knowledge of electricity and magnetism such as electric charge, electric potential, magnetic fields, electromagnetic waves.CLO2. Examine problem solving in				
	Skill	CLO3. Understand and acquire skills needed to use physical laws governing real process and to solve them in the engineering environment				
	Attitude	CLO4. Develop confidence discussing physics in Englis	e and flu sh	ency in		
Content	The description of the contents should clearly indicate the weighting of the content and the level.					
	Teaching levels: I (Introduce): T (Teach): U (Utilize)					
	Topic	Weight	Level			
	Chapter 1: Ele	ctric Fields	3	I, T, U		
	Chapter 2: Capacitance	Electric Potential and	2	I, T, U		
	Chapter 3: Cu Current Circui	rrent and Resistance. Direct ts	3	I, T, U		
	Chapter 4: Ma	gnetism	2	I, T, U		
	Chapter 5: Ele	2	I, T, U			
	Chapter 6: E and Alternatin	2	I, T, U			
	Chapter 7: Electromagnet	1	I, T, U			
Examination forms	Short-answer qu	uestions				
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.					
	50/100 points of	verall to pass this course.		iiaii		

Reading list	[1] Halliday D., Resnick R. and Walker, J. (2011) <i>Fundamentals</i> of <i>Physics</i> , 9 th edition, John Willey and Sons, Inc.
	[2] Alonso M. and Finn E.J. (1992) <i>Physics</i> , Addison-Wesley Publishing Company.
	[3] Hecht, E. (2000) <i>Physics: Calculus,</i> 2 nd edition, Brooks/Cole.
	[4] Faughn/Serway (2006) <i>Serway's College Physics</i> , Thomson Brooks/Cole.

2. Learning Outcomes Matrix (optional) The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-10) is shown in the following table:

	PLO									
CLO	1	2	3	4	5	6	7	8	9	10
1	X									
2	X									
3										
4										

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning	Resources
	-			activities	
			Quiz 1/		
		1, 2,	Assignment	Lecture,	[1].0.
1-3	Chapter 1: Electric Fields	3, 4	Midterm exam	Discussion	[2].1.
			Quiz 2/		
	Chapter 2: Electric	1, 2,	Assignment	Lecture,	
4-5	Potential and Capacitance	3, 4	Midterm exam	Discussion	[1].9.
	Chapter 3: Current and				
	Resistance. Direct Current	1, 2,	Assignment	Lecture,	
6-7	Circuits	3, 4	Midterm exam	Discussion	[2].2.
	Chapter 4: Magnetism	1, 2,	Assignment	Lecture,	[2]. 4.
8	(Part 1)	3, 4	Final exam	Discussion	[1]. 18.
9-10	Midterm				
			Quiz 3/		
	Chapter 4: Magnetism	1, 2,	Assignment	Lecture,	[2]. 4.
11-12	(Part 2)	3, 4	Final exam	Discussion	[1]. 18.
			Quiz 4/		
	Chapter 5: Electromagnetic	1, 2,	Assignment	Lecture,	
13-14	Induction	3, 4	Final exam	Discussion	[3]. 10
	Chapter 6: Electromagnetic				
	Oscillations and	1, 2,	Assignment	Lecture,	[2]. 4.
15-16	Alternating Current	3, 4	Final exam	Discussion	[1]. 18.

Week	Торіс	CLO	Assessments	Learning activities	Resources
	Chapter 7: Maxwell's				
	Equation and	1, 2,			
17	Electromagnetic Waves	3, 4	Final exam	Lecture	[3]. 10
18-19	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Attendance + Homework				
+ in-class discussion				
(15%)				
			Qz1, Qz2,	Qz1, Qz2,
	Qz1, Qz3/	Qz2, Qz4/	Qz3, Qz4 /	Qz3, Qz4 /
Quizzes (Qz) /	As.P1	As.P2	As.P3	As.P4
assignment (As) (15%)	50%Pass	50%Pass	50%Pass	50%Pass
	Q1, Q2, Q3	Q4, Q5	Q3, Q5	Q3, Q5
Midterm exam (30%)	50%Pass	50%Pass	50%Pass	50%Pass
	Q1, Q2, Q3	Q4, Q5	Q3, Q5	Q3, Q5
Final exam (40%)	50%Pass	50%Pass	50%Pass	50%Pass

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

5. Rubrics (optional)

Grading checklist for Written Reports					
Student:	HW/Assignment: 				
	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				

5.1 Grading checklist

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

Hol	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	Milest	one	Benchmark
	4	3	2	1
Explanation of	Issue/ problem to be considered critically is stated clearly and described comprehensivel y, delivering all relevant information necessary for	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined , and/ or	Issue/ problem to be considered critically is stated without
Explanation of	IUII		backgrounds	
issues	Information is	Information is	Unknown.	Information is
Evidence	Information is taken from	Information is taken from	Information is taken from	Information is taken from
Selecting and	source(s) with	source(s) with	source(s)	source(s)
using information	enough	enough	with some	without any
to investigate a	interpretation/	interpretation/	interpretation	interpretation/
point of view or	evaluation to	evaluation to	/ evaluation,	evaluation.
conclusion	develop a	develop a	but not	Viewpoints of

	comprehensive	acharant	anough to	avparts are
	comprenensive		davalar a	talen as fast
	analysis of	analysis of	develop a	taken as fact,
	Viewe sints of	Viewe sinte of		without
	viewpoints of	viewpoints of	analysis or	question.
	experts are	experts are	synthesis.	
	questioned	subject to	viewpoints	
	thoroughly.	questioning.	of experts are	
			taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	~1
			Identifies	Shows an
	Thoroughly		several	emerging
	(systematically		relevant	awareness of
	and		contexts	present
	methodically)		when	assumptions
	analyzes own		presenting a	(sometimes
	and others'	- 4 . 1	position. May	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions).
	evaluates the	assumptions and	others'	Begins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific position			
	(perspective,			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	account the	C		
	complexities of	Specific position		
	an issue. Limits	(perspective,		
	(normanities) tolvos into		
	thesis/	j takes into		
	hypothesis) are	complexities of	Specific	
	acknowledged	an issue Others!	nosition	Specific
	Others' points of	noints of view	(perspective	position
	view are	points of view	thesis/	(perspective
Student's	synthesized	acknowledged	hypothesis)	thesis/
nosition	within position	within position	acknowledge	hypothesis) is
(nerspective	(nerspective	(nerspective	s different	stated but is
thesis/hvnothesis	thesis/	thesis/	sides of an	simplistic and
)	hypothesis).	hypothesis).	issue.	obvious.

			Conclusion is	
			logically tied	
	Conclusions and		to	Conclusion is
	related outcomes	Conclusion is	information	inconsistently
	(consequences	logically tied to	(because	tied to some
	and	a range of	information	of the
	implications) are	information,	is chosen to	information
	logical and	including	fit the desired	discussed;
	reflect student's	opposing	conclusion);	related
	informed	viewpoints;	some related	outcomes
Conclusions and	evaluation and	related outcomes	outcomes	(consequences
related	ability to place	(consequences	(consequence	and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplified
consequences)	priority order.	clearly.	clearly.	•

Source: Association of American Colleges and Universities

Aral	communication	valua rubri	o for	maluating	nrasantation t	acker
Urui	communication	value radri	l jui	evalualing	presentation i	usns.

	Capstone	Milestone		Benchmark
	4	3	2	1
	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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within
Organization	cohesive.	presentation.	presentation.	the presentation.
	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to
Language	audience.	audience.	audience.	audience.

	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eve	contact, and	eve contact. and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	nresentation	make the	presentation	understandability
	compelling and	nresentation	understandable	of the
	speaker appears	interesting and	and sneaker	presentation and
	polished and	speaker appears	and speaker	speaker appears
Delivery	confident	comfortable	tentative	uncomfortable
Denvery	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(avalanations	(explonations	(avalanations	insumorting
	(explainations,	(explainations,	(explainations,	matariala
	examples,	illustrations	illustrations	(avalanations
	inustrations,	inustrations,	inustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	inustrations,
	quotations from	quotations from	quotations from	statistics,
	relevant	relevant	relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	таке	таке	таке	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: January 12, 2022

Course Code: PH016IU

1. General information

Course designation	This course provides students with basic knowledge of electricity and magnetism in laboratory, consists of: Ohm's law, LRC circuit, RC circuit, LR circuit, magnetic fields of coils
Semester(s) in which the course is taught	1, 2
Person responsible for the course	Msc. Lê Thị Quế Msc. Trịnh Thanh Thủy
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, assignment.
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 60 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): lecture: 30 Private study including examination preparation, specified in hours: 30
Credit points	1
Required and recommended prerequisites for joining the course	Physics 3 (PH015IU)
Course objectives	 This course will provide students with: The basic concepts in electricity and magnetism. Have laboratory experiences. Skills to solve problems in engineering environment by applying both theoretical and experimental techniques Skill to present scientific report in writing, and better understand the relations between theory and experiment. Confidence and fluency in discussing physics in English.

Course learning	Upon the success able to:	sful comp	oletion of	this cou	rse students will be
outcomes	Competency Course level		Course learning outcome (CLO) CLO1. Understand the basic concepts in electricity and magnetism.		
	Knowledge CLO1. electrici				
	Skill	.O2. Approach and solve problems in ectricity and magnetism experiments			
		CLO3. underst theory a	Write anding and exper	scientif the re iment	ic report, have lations between
	Attitude	Attitude CLO4. An ability to communi- effectively in writing English manner			to communicate glish manner
Content	The description of weighting of the description of	of the cont content ar	ents shou nd the leve	ld clearl <u></u> l.	y indicate the
	Weight: experimental session (4 hours)				
	Teaching levels:	ce); 1 (1e	acn); U	(Utilize)	
			weight	Level	
	Unm's law		1	1, U	
	Resistances in Circuits		1	T, U	
	LRC Circuits Kirchhoff's laws RC circuit LR circuit		1	T, U	
			1	T, U	
			1	T, U	
			1	T, U	
	Magnetic fields	s of coils	1	T, U	
	The e/m experiment		1	T, U	
Examination forms	Short-answer que	estions, ta	king expe	riment, v	write report
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				
		erall to pa	ss this col	arse.	011) E J
Keading list	 [1] Halliday D., Resnick R. and Walker, J. (2011) <i>Fundamentals</i> of <i>Physics</i>, 9th edition, John Willey and Sons, Inc. [2] Labguide. 				

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:

	PLO									
CLO	1	2	3	4	5	6	7	8	9	10
1	x									
2	x									
3										
4										

3. Planned learning activities and teaching methods

				Learning	
Week	Торіс	CLO	Assessments	activities	Resources
	Ohm's law		Prelab answer, Lab	Taking	[1].
1		1, 2	report	experiment	[2].
	Resistances in	1, 2	Prelab answer, Lab	Taking	[1].
2	Circuits		report	experiment	[2].
	LRC Circuits	1, 2	Prelab answer, Lab	Taking	[1].
3			report	experiment	[2].
	Kirchhoff's laws	1, 2	Prelab answer, Lab	Taking	[1].
4			report	experiment	[2].
	RC circuit	1, 2	Prelab answer, Lab	Taking	[1].
5			report	experiment	[2].
	LR circuit	1, 2	Prelab answer, Lab	Taking	[1].
6			report	experiment	[2].
	Magnetic fields of	1, 2	Prelab answer, Lab	Taking	[1].
7	coils		report	experiment	[2].
	The e/m	1, 2	Prelab answer, Lab	Taking	[1].
8	experiment		report	experiment	[2].
9	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Prelab	Prelab1-8			Prelab1-8
(20%)	60%Pass			60%Pass
Lab report (30%) Attendance (20%)	Labreport 1-8 50%Pass	Labreport 1-8 50%Pass	Labreport 1-8 50%Pass	Labreport 1-8 50%Pass
Final exam (30%)	Part I.1 50%Pass	Part I.2 50%Pass	Part II.1,2 50%Pass	Part II.3 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
Stu	Student:		HW/Assignment:		
Dat	e:	•••••			
		Evaluator:			
		•••••		••••	
		Max.	Score	Comments	
	Technical content (60%)				
Abstract clearly identifies purpose and summarizes principal content					
Introduction demonstrates thorough knowledge of relevant background and prior work					
Analysis and discussion demonstrate good subject mastery					
Summ	Summary and conclusions appropriate and complete				
	Organization (10%)				
Distin	ct introduction, body, conclusions	5			
Conter transit	nt clearly and logically organized, good ions	5			
	Presentation (20%)				
Correc	ct 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				
Hol	istic rubric for evaluating the entire document,	e.g., exe	rcises/qu	izzes/HW	
Score	Description				
5	Demonstrates complete understanding of the problem included in response	em. All	requirem	ents of task are	
4		1.1	. 11 .	0 1	

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

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			Iccue/	
			issue/	
			considered	
	_ /		critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	
	comprehensivel	stated,	ambiguities	Issue/
	v. delivering all	described, and	unexplored.	problem to be
	relevant	clarified so that	boundaries	considered
	information	understanding is	undetermined	critically is
	necessary for	not seriously	and/ or	stated without
Explanation of	full	impeded by	backgrounds	clarification
	understanding	omissions	unknown	or description
155005	understanding.	01113510115.	Information	or description.
			is taken from	
			source(s)	
			with some	
	Information in	Information in		
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
	comprehensive	coherent	synthesis.	interpretation/
Evidence	analysis or analysis or View		Viewpoints	evaluation.
Selecting and	synthesis.	synthesis.	of experts are	Viewpoints of
using information	Viewpoints of	Viewpoints of	taken as	experts are
to investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	
			Identifies	Shows an
	Thoroughly		several	emerging
	(systematically		relevant	awareness of
	and		contexts	present
	methodically)		when	assumptions
	analyzes own		presenting a	(sometimes
	and others'		position. May	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions).
	evaluates the	assumptions and	others'	Begins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.

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

Source: Association of American Colleges and Universities

Oral	communic	ation val	lue rubrio	: for	evaluating	presentation	tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational	Organizational	Organizational	
	pattern (specific	pattern (specific	pattern (specific	Organizational
	introduction	introduction	introduction	pattern (specific
	and conclusion,	and conclusion,	and conclusion,	introduction and
	sequenced	sequenced	sequenced	conclusion,
	material within	material within	material within	sequenced
	the body, and	the body, and	the body, and	material within
	transitions) is	transitions) is	transitions) is	the body, and
Organization	clearly and	clearly and	intermittently	transitions) is not

	agnetistantly	aangistantly	obcorreblo	abcomuchla within
	consistently	consistently	observable	the presentation
	is shillful and	observable	within the	the presentation.
	is skilling and	within the	presentation.	
	makes the	presentation.		
	content of the			
	presentation			
	conesive.		Τ	
		Τ		
	choices are		choices are	Τ
	imaginative,	choices are	mundane and	Language
	memorable, and	thoughtful and	commonplace	choices are
	competing, and	generally	and partially	unclear and
	ennance the	support the	support the	minimally
	effectiveness of	effectiveness of	effectiveness of	support the
	the	the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is presentation is presentation is		presentation is	presentation is
T	appropriate to	appropriate to	appropriate to	not appropriate to
Language	audience.	audience.	audience.	audience.
	Delivery	Dalimary	Delivery	Delivery
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	make the	datraat from the
	make the	make the	nrasentation	uetract from the
	compelling and	nresentation	understandable	of the
	speaker appears	interesting and	and speaker	presentation and
	speaker appears	sneaker appears	and speaker	speaker appears
Dolivory	confident	speaker appears	tentative	uncomfortable
Denvery	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations	(explanations	materials
	materials	examples	examples	(explanations
	(explanations	illustrations	illustrations	examples
	examples	statistics	statistics	illustrations
	illustrations.	analogies.	analogies.	statistics.
	statistics.	quotations from	quotations from	analogies.
	analogies.	relevant	relevant	quotations from
	quotations from	authorities)	authorities)	relevant
	relevant	make	make	authorities) make
	authorities)	appropriate	appropriate	reference to
	make	reference to	reference to	information or
	appropriate	information or	information or	analysis that
	reference to	analysis that	analysis that	minimally
	information or	generally	partially	supports the
Supporting	analysis that	supports the	supports the	presentation or
Material	significantly	presentation or	presentation or	establishes the

	supports the presentation or establishes the presenter's credibility/	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.
	authority on the			
	topic.			
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

6. Date revised: January 12, 202

Course Name: Speaking AE2

Course Code: EN012IU

1. General information

Course designation	Giving presentations today becomes a vital skill for students to succeed not only in university but also at work in the future. Speaking AE2, therefore, provides students with the knowledge and skills needed to deliver effective presentations (informative and persuasive presentations).
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Lecturers of Department of English
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, mini presentations
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours ⁵ : 60
Credit points	2
Required and recommende d prerequisites for joining the course	Students must complete AE1 courses
Course objectives	Speaking AE2 aims at introducing an training students many aspects of giving a presentation: building up confidence, preparing and planning, using the appropriate language, applying effective visual aids, applying delivery techniques, dealing with questions and responding, performing body language, and so on.

⁵ 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	Upon the successful completion of this course, students will be able						
learning	to: Competency Course learning outcome (CLO)						
outcomes	Competency	Course learning outcome (CLC	D)				
	Knowledge	CLO1 Understand many aspects of giving a					
	ittiowieage	presentation: building up confidence, preparing					
		and planning, using the appro	priate lar	nguage,			
		applying effective visual aids, a	pplying d	lelivery			
		techniques, dealing with	questions	and			
	<u> </u>	responding, performing body lan	iguage	<u> </u>			
	Skill	CLO2. Prepare and deliver ex	ffective,	formal,			
		specific environment and audien	ce.				
	Attitude	CLO3. Deliver both informative	e and per	suasive			
		speech with confidence	Ĩ				
Content	The description of the contents should clearly indicate the weighting of the content and the level.						
	Weight: lecture session (2 hours)						
Teaching levels: I (Introduce); T (Teach); U (Utilize)							
	Торіс			Leve			
	Orientation & In	troduction	2	IT			
	Needs analysis	_	U				
	Building up cont	fidence	2	T, U			
	The first few min	nutes	2	T, U			
	Organizing what	you want to say	2	T, U			
	Summarizing and	d concluding	2	T, U			
	Using equipment	t	2	T, U			
	Delivery techniq	ues: Putting it all together	2	T, U			
	Group presentati evaluation and a	Group presentations for the instructor's evaluation and advice		U			
	Introduction to p	ersuasive speeches	2	T, U			
	Methods of perso	uasion	2	T, U			
	Maintaining inte	rest	2	T, U			
	Dealing with pro	blems and questions	2	T, U			
	Body language		2	T, U			
	Individual preseneration and a	4	U				

Examination forms	Oral Presentations
Study and examination requirements	Attendance Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination.
	<i>Missed Tests</i> Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (e.g. certified paper from doctors), students may re-take the examination.
	 Class Behaviors Students are required to treat their studying in college as a full-time job and spend an adequateamount of time for this Speaking AE2 course with approximately 8-10 hours per week (both in class and self-study). Accordingly, students are supposed to follow the obligations below: Prepare thoroughly for each class in accordance with the course syllabus and completehome assignments as the instructor's request. Participate fully and constructively in all course activities and discussions (if any). Display appropriate courtesy to all involved in the class. Provide constructive feedback to faculty members regarding their performance.
	<i>Plagiarism</i> Students are warned not to copy from other books or from their peers for all assessment tasks. Committing plagiarism will result in 0 point for the task. Students who plagiarize twice will be prohibited from sitting the final examination.
Reading list	 [1] Lowe, S, & Pile, L. (2010). <i>Presenting</i>. Singapore: Cengage Learning [2] Comfort, J. (1997). <i>Effective presentations</i>. Oxford: Oxford University Press
	[3] Lucas, S. (2014). <i>The art of public speaking</i> (12 th edition). New York: McGraw-HillEducation.
	[4] Harrington, D., & Lebeau, C. (2009). Speaking of speech. Macmillan

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:

	SLO					
CLO	1	2	3	4	5	6
1						
2						
3						
4						

3. Planned learning activities and teaching methods

WEE K	Content	MATERIAL(S)	ACTIVITI ES
		[1] Presenting, p. 5	Students will:
		[1]1.00000008, P. 0	• receive an introduction to
11	. Orientation		effectivepresentation
	& Introduction		• think about their strength and
	· Needs		weaknesses in presenting in
EF	analysis		English
IW	······································		• identify and prioritize their
			immediate and future needs
			forpresenting
			• share tips on improving
			weaknesses
			Student will:
0	Building		- give a short speech about
K	up		themselves to help them
EE	confidence		overcomeinitial shyness of
2			standing up and
			speaking in public
		• Presenting, pp. 8-13	Students will:
	Unit 1: The	• Effective	• learn the importance of making
~	firstfew	Presentations: p.7 +	agood first impression
K	minutes	video clip; p.13+	• learn useful phrases for greeting
EE		videoclip	the audience, introducing
A A			themselves and others, and giving
			the purpose of
			their presentation

	Unit 3:	• Presenting, pp.	Students will:
	Organizing	22-27)	• look at the importance of
	whatyou want	• Effective	structuring their presentation
ζ4	to say	Presentations: p.19	• learn the useful phrases for
Ē		+video clip	outlining their presentation,
WI			organizing ideas and moving
			between different sections of
			their
			presentation
	Unit 6.	• Presenting, pp.	Students will:
	Summarizing	40-45	 look at ways of finishing
X 5	and concluding	<i>Effective</i>	apresentation effectively
EK	and concluding	Presentations: p.41	 learn useful phrases for
VE		+video clip	endingtheir presentation,
			summarizing,
			handing over and thanking
	II. • A	• <i>Presenting</i> , pp.	Students will:
	Unit 2:	14-21)	• use equipment and visuals
9	Using	<i>Effective</i>	tosupport their presentation
EK	equipment	Presentations: p.31	• learn useful phrases for
WE		+video clip	referringto visuals, ensuring their
F			audience
			can see and expanding on notes
	Delivery	[2] Effective	Students will:
X 7	techniques:	Presentations: p.50	• watch a model presentation and
E	Putting it	+ video clip	discuss do's and don'ts for
IM	alltogether	Assignment:	effective delivery
		lopic(s)	• pick group members and plan their
		for group presentation)	presentations for Week 8
	Group		• take turn to deliver a presentation
K 8	presentations for		on the tonic(s) assigned by the
E	the instructor's		instructor
M	evaluation and		• consult the instructor for advice on
	advice		the mid-term evan preparation
		MIDTERM EXAMIN	ATION
S	Students will give a t	five-to-six minute informa	tive presentation on a topic to be
2		determined.	1
	Introduction to	[3] The art of public	Students will:
6	persuasive	speaking, Chapter 15	• know types of persuasive speeches
EK	speeches	(Handout given by	 know typical organizations of
WE		the	apersuasive speech
		instructor)	

		[3] The art of public	Students will learn to persuade the		
ζ 10	Mathads of	speaking, Chapter 16	audience by:		
X	nersussion	(Handout given by the	• building credibility		
/E F	persuasion	instructor)	• using evidence		
И			• reasoning		
			• appealing to emotions		
		• Presenting: pp.	Students will:		
	Unit 4:	28-33)	 look at maintaining 		
	Maintainin	<i>Effective</i>	interest through effective		
X 11	ginterest	Presentations: p.25	delivery		
	Sinterest	+video clip)	• learn useful phrases for		
JEK			clarifyingwhat you mean,		
WE			checking if the audience is		
			following and involving		
			the audience		
		• Presenting: pp.	Students will:		
0	Unit 5:	34-39)	• learn strategies for coping		
K 10	Dealing with	o <i>Effective</i>	inunexpected situations		
EE	problems and	Presentations:	learn useful phrases for		
M	questions	p.44(Question	dealing with problems and		
		time)	questions		
		[2] Effective	Students will:		
		Presentations : pp.36-	• practise using language and		
3	Unit 6.	39	bodylanguage to communicate the		
K 1	Body		message clearly and persuasively		
EE	languaga		• watch video clips about		
M	language		bodylanguage		
			• learn how to control posture, eye		
			contact, gestures and voice inflection		
14		(to be determined by	Students will:		
IK	Practice	the instructor)	- deliver individual or group		
VEI			presentations (assigned by the		
M			instructor)		
S		(to be determined by	Students will:		
K1	Wrap-up	the instructor)	• consult the instructor for advice		
EEI	andadvice		on the final exam preparation		
M			• continue to deliver individual or		
			group presentations (if any)		
		FINAL EXAMINA	TION		
Students will deliver a seven-to-eight-minute persuasive presentation on a topic to					

4. Assessment plan

bedetermined

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	Very Poor	Poor	Average	Good	Excellent
Pronunciation, Voice Techniques (Pauses, Volume, Speed Change, Stress, Tone, Etc)	 Mumbles, often mispronounces, very difficult to understand. Dead person talking, voice to text software does better 	 Slurred speech, mispronounces some words. Difficult to understand. Quiet, monotone, sing/song, little or no expression, boring. 	 Clear voice, few pronunciation errors. Some slurring Most can understand the presentation Some use of voice to show interest 	 Crisp, clear voice, correct, precise pronunciation, all can understand. proper volume; steady rate; enthusiasm; confidence 	- Native like
Grammar& Vocabulary (Usage And Appropriateness For Audience)	 Frequent grammar or spelling errors Inappropriate level. for the audience, Misuse vocabulary 	 Noticeable Errors Often too simple or sophisticated, inconsistent. Some vocabulary incorrectly used 	 Minor errors Generally appropriate, little variation or creativity 	 No errors, but simple language Always appropriate for the audience. Excellent use of vocabulary 	 No errors. Excellent use of grammar to support ideas Creative use of language
Body Language, Gestures, Eye Contact (Turns back to audience and reads screen – 0)	 Dead person on stage Almost no eye contact, reads notes/screen 	 Excessive movement or many distracting gestures Occasionally eye contact, mostly reads notes/screen 	 Some distracting gestures, and some movement and useful gestures Generally maintains eye contact frequently reads notes/screen 	 No distracting gestures. Body language supports speech Excellent eye contact, seldom uses notes 	 Excellent use of body language Constant eye contact, no use of notes
Organization: Intro, Main, Ending, Coherence (see RATING CHECKLIST)	 Difficult to follow as disorganized 	 Generally follows outline, poor introduction or conclusion. 	 Follows outline, material generally well organized. Some use of transitions and linkage of ideas. Conclusion acceptable 	 Follows outline, material well organized. Ideas clearly linked. Some use of transitions 	 Excellent, clear linkage of ideas. Good transitions Arouses interest in Introduction, and summarizes clearly main points in conclusion
Content: Relevant/ Interesting/ Accurate	- Several errors or lacks critical information	- Some errors and has irrelevant information	 Information is generally accurate, minor errors, generally meets needs of the audience 	 Accurate information, related to needs of audience 	 No errors, answers all needs of the audience
Visual Aids: Appropriate, Clear (Movies, sound – 0)	 Slides consist of full paragraphs of text, no or superfluous graphics Tiny font 	 Slides have full sentences and occasional superfluous graphics, Difficult to read 	 Slides have short phrases, Graphics relate to text and presentation. Easily read 	 Attractive, informative graphics, only key words, easily understood, Good use of masking 	 Professional quality, Excellent use of visual, no unrelated graphics, easily read, supports presentation
Overall effectiveness	 Ineffective, alienated audience 	 Little positive effect or exchange of info Audience bored 	 Audience learned something, no change in attitude 	 Audience generally positive and learned from presentation 	 Audience was kept interested and would remember key points

Assessment Type	CLO1	CLO2	CLO3
On-going Assessment (30%)			
(discussion, group presentation, individual			
presentation, and so on)			
(It is requested that lecturers collect students'			
scripts or any type of evidence of their	80%	80%	
participation for possible fact check).	Pass	Pass	80% Pass
Midterm exam (30%)			
(Students will give a five-to-six-minute			
informative presentation on a topic to be	80%	80%	
determined)	Pass	Pass	80% Pass
Final exam (40%)			
(Students will deliver a seven-to-eight-minute			
persuasive presentation on a topic to be	80%	80%	
determined.)	Pass	Pass	80% Pass

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

5. Rubrics & Marksheets

6. Midterm exam rubrics and marksheets

INTERNATIONAL UNIVERSITY DEPARTMENT OF ENGLISH

SPEAKING AE2 - MIDTERM EXAMINATION RATING CHECKLIST

Yes

No

ACADEMIC YEAR 2021 - 2022 DATE:

Student name :__ Student ID : _____ Topic :

Wtg. Criteria Very poor Poor Average Good Excellent Comments **Pronunciation & Voice Techniques** (1-3) (4-6) (7-9) (10-12) (13-15) 15 (Pause, Volume, Speed Change, Stress, Tone, etc.) Language use: Grammar & (1-3) (4-6) (7-9) (10-12) (13-15) 15 Vocabulary (usage and appropriateness for audience) Body Language: Gestures, Eye (1-2) (3-4) (5-6) (7-8) (9-10) contact, Facial expressions 10 (turns back to the audience and reads from screen: 0 pt) (1-4) (5-8) (9-12) (13-16) (17-20) Organization: Intro, Body, Ending, 20 Coherence (see below) (9-12) (13-16) (17-20) (1-4) (5-8) 20 Content: Relevance, Accuracy (1-2) (3-4) (5-6) (7-8) (9-10) Visual aids: Appropriateness, Clarity 10 (Movies, sound: 0 pt) (1-2) (3-4) (5-6) (7-8) (9-10) 10 **Overall effectiveness** FINAL SCORE: /100

Negative points: \diamond <u>Timing</u>: <3m: -15pts 3m - 3m29: -10pts 3m30 - 3m59: -5pts 4m - 6m: OK >6m: -5pts

Organization:

Α.	Introdu	iction	
	a.	Greeting, name, position (Good morning ladies and gentlemen. My name is, I'm a)	
	b.	Purpose/ Objective (The purpose of this talk is to)	
	c.	Connect with the audience (I can see that all of you love to)	
	d.	Outline/ Main part (I've divided my presentation into parts)	
	e.	Questions (Should you have any questions, please save them until the end of my presentation)	
B.	Body (7	ransitions: Let's start with/ That brings me to/ Firstly, Secondly, Next, Lastly)	
C.	Ending		
	a.	Signaling the end (That brings me to the end of my presentation)	
	b.	Summary (Let me just run over the key points again)	
	с.	Closing (Thank you very much for your attention)	
	d.	Inviting questions (I'd be glad to answer any questions you might have)	
Exami	ner	:	

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7. Final exam rubrics and marksheets

	Very Poor	Poor	Average	Good	Excellent
Pronunciation, Voice Techniques (Pauses, Volume, Speed Change, Stress, Tone, etc.)	 Mumbles, often mispronounces, very difficult to understand. Dead person talking, voice to text software does better 	 Slurred speech mispronounces some words. Difficult to understand. Quiet, monotone, sing/song, little or no expression, boring. 	 Clear voice, few pronunciation errors. Some slurring Most can understand the presentation Some use of voice to show interest 	 Crisp, clear voice, correct, precise pronunciation, all can understand. Proper volume; steady rate; enthusiasm; confidence 	- Native like
Grammar & Vocabulary (Usage and Appropriateness for Audience)	 Frequent grammar or spelling errors Inappropriate level. for the audience, Misuse vocabulary 	 Noticeable Errors Often too simple or sophisticated, inconsistent. Some vocabulary incorrectly used 	 Minor errors Generally appropriate, little variation or creativity 	 No errors, but simple language Always appropriate for the audience. Excellent use of vocabulary 	 No errors. Excellent use of grammar to support ideas Creative use of language
Body Language: Posture, Gestures, Eye contact, Facial expression (Turns back to audience and reads screen – 0)	 Dead person on stage Almost no eye contact, reads notes/screen 	 Excessive movement or many distracting gestures Occasionally eye contact, mostly reads notes/screen 	 Some distracting gestures, and some movement and useful gestures Generally maintains eye contact frequently reads notes/screen 	 No distracting gestures. Body language supports speech Excellent eye contact, seldom uses notes 	 Excellent use of body language Constant eye contact, no use of notes
Organization: Intro, Main, Ending, Coherence (see RATING CHECKLIST)	 Difficult to follow as disorganized 	 Generally follows outline, poor introduction or conclusion. 	 Follows outline, material generally well organized. Some use of transitions and linkage of ideas. Conclusion acceptable 	 Follows outline, material well organized. Ideas clearly linked. Some use of transitions 	Excellent, clear linkage of ideas. Good transitions Arouses interest in Introduction, and summarizes clearly main points in conclusion
Content: Relevant/Accurate, Informative and Persuasive	 Several errors or lacks critical information 	 Some errors and has irrelevant information Just focus on giving information 	Information is generally accurate, minor errors Give reasons with little or no emphasis on persuasion	 Accurate information, related to needs of audience Give frequent emphasis on persuasion 	 No errors, answers all needs of the audience Persuade the audience well
Visual Aids: Appropriateness, Clarity (Use of video clip exceeding 20 seconds - 0)	 Slides consist of full paragraphs of text, no or superfluous graphics Tiny font 	 Slides have full sentences and occasional superfluous graphics, Difficult to read 	 Slides have short phrases; Graphics relate to text and presentation. Easily read 	 Attractive, informative graphics, only key words, easily understood, good use of masking 	 Professional quality, Excellent use of visual, no unrelated graphics, easily read, supports presentation
Question response	 Welcomes the question 	 Listens carefully, doesn't interrupt 	 Thinks before answering Clarifies, rephrases as needed 	 Answers correctly and briefly 	 Checks to see if questioner is satisfied



SPEAKING AE2 - FINAL EXAMINATION RATING CHECKLIST

ACADEMIC YEAR 2021 - 2022 DATE: _____

Student name	-	Student ID	3
Topic	:		

tg.	Criteria	Very poor	Poor	Average	Good	Excellent	Comments
5	Pronunciation & Voice Techniques (Pause, Volume, Speed Change, Stress, Tone, etc.)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
10	Language use: Grammar & Vocabulary (usage and appropriateness for audience)	(1-2)	(3-4)	(5-6)	(7-8)	(9-10)	
15	Body Language: Posture, Gestures, Eye contact, Facial expression (turns back to the audience and reads from screen: 0 pt)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
15	Organization: Intro, Body, Ending, Coherence (see below)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
20	Content: Relevant, Accurate, Informative and Persuasive	(1-4)	(5-8)	(9-12)	(13-16)	(17-20)	
15	Visual aids: Appropriateness, Clarity (Movies, sound: 0 pt)	(1-3)	(4-6)	(7-9)	(10-12)	(13-15)	
10	Question response	(1-2)	(3-4)	(5-6)	(7-8)	(9-10)	
	SCORE (max.100):	BONUS (max. 10):			TOTAL SCORE (max.100):		

Bonus points: Up to 10pts for creativity, which involves PowerPoint design, Organization of information, Presentation style ...

Organi	ization:		Yes	No
A.	Introdu	iction		
	a.	Greeting, name, position (Good morning, ladies and gentlemen. My name is I'm a)		
	b.	Connect with the audience (I can see that all of you love to)		
	c.	Purpose/ Objective (The purpose of this talk is to)		
	d.	Time length (My presentation should last for)		
	e.	Outline/ Main part (I've divided my presentation into parts)		
	f.	Questions (Should you have any questions, please save them until the end of my presentation)		
B.	Body (1	"ransitions: Let's start with/ That brings me to/ Firstly, Secondly, Next, Lastly)		
С.	Ending			
	a.	Signaling the end (That brings me to the end of my presentation)		
	b.	Summary (Let me just run over the key points again)		
	c.	Closing (Thank you very much for your attention)		
	d.	Inviting questions (I'd be glad to answer any questions you might have)		

Examiner

: ___

Date revised: 15 August, 2022

Course Name: Writing AE2

Course Code: EN011IU

1. General information

Course designation	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.			
Semester(s) in which the course is taught	1, 2, 3			
Person responsible for the course	Lecturers of Department of English			
Language	English			
Relation to curriculum	Compulsory			
Teaching methods	Lecture, lesson, project			
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 90 Contact hours (lecture, exercise): 30 Private study including examination preparation, specified in hours: 60			
Credit points	2			
Required and recommended prerequisites for joining the course	Students must complete Writing AE1 course			
Course objectives	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. 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.			

Course learning	Upon the succes to:	sful completion of this course, st	udents wi	ll be able		
	CompetencyCourse learning outcome (CLO)level					
	Knowledge CLO1. Understand the structure of a research paper and employ appropriate academic language in writing a research paper					
	Skill CLO2. Read critically, analyze, and annotate academic articles and journals					
		CLO3. Employ the research obtained to work on their ow major study.	h writing 7n paper	g skills in their		
	Attitude	CLO4. Reason around ethical research paper and avoid comm	issues in hitting play	writing giarism		
Content	The description weighting of the	of the contents should clearly ind content and the level.	licate the			
	Weight: lecture	session (2 hours)				
	Teaching levels:	lize)				
	Topic			Level		
	Unit 1: The Introduction	4	I, T, U			
	Unit 2: Researching and Writing			T, U		
	Unit 3: Fundamentals & Feedback 2 T,					
	Unit 4: Definiti	2	T, U			
	Unit 5: Generalizations, Facts and Honesty			T, U		
	Unit 6: Seeing Ideas and Sharing Texts			T, U		
	Unit 7: Descrip	2	T, U			
	Unit 8: Results	2	T, U			
	Unit 9: The Wł	2	T, U			
	Unit 10: Creating the Whole Text			T, U		
	Course Review			U		
Examination forms	Essay writing					
Study and examination requirements	Attendance Regular on-time attendance in this course is expected. A student will be allowed no more than three absences. It is compulsory that the students attend at least 80% of the course to be eligible for the final examination. Assignment (Literature review)					

Purpose: Students will use the knowledge of paraphrasing, summarising, developing arguments, and APA styles to write a 1,000-word literature review on a research scope of their choice. Task:
• Follow guidelines on how to write a literature review.
 Use relevant academic writing skills such as paraphrasing, summarising, developing arguments, and APA 7th Style Guidelines – see <u>https://www.apastyle.org/</u> Develop arguments in relation to the research scope and identify the research gap
Notes: All papers should be typed, double-spaced, in 13-pt font, and with 1-inch margins. All papers must be original for this class. Criterion-referenced grading is used in this course. <i>Missed Tests</i>
Students are not allowed to miss any of the tests (both Mid-term and Final). There are very few exceptions. Only with extremely reasonable excuses (eg. certified paper from doctors), students may re- take the examination.
Class Behaviors
Students are required to treat their studying in college as a full- time job and spend an adequate amount of time for this Writing AE2 course with approximately 8-10 hours per week (both in class and self- study). Accordingly, students are supposed to follow the obligations below:
 Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request. Participate fully and constructively in all course activities and discussions (if any).
• Display appropriate courtesy to all involved in the class.
• Provide constructive feedback to faculty members regarding their performance.
Plaoiarism
All forms of plagiarism and unauthorised collusion are seriously regarded and could result in penalties.
Plagarism occurs when students copy or reproduce people's words or ideas and then present them as students' own work without proper acknowledgement, including when students copy the work of their fellow students.
Plagiarism in student submissions can be detected by:
 some web-based programs such as SafeAssign or Turnitin, or
• examiner's judgments with evidence of originals
The rater will review the paper to check if citations or references are provided properly. Penalties due to improper citations or references include:

	Degree of magnitude	Description		
	Below 15%	Marked as it is.		
	15% - 25%	The score is deducted by 25%.		
	25% - 40%	The score is deducted by 50%		
	Over 40%	The score is 0 .		
	Notes: Part of the test detected. Students wh prohibited from sittin	t is marked as it is if no plagiarism to plagiarize over 40% <u>twice</u> wil g the final examination.	m is l be	
	Writing Center (Room 509)			
	Students are encouraged to visit the Writing Center or to schedule an appointment for additional help.			
Reading list	[1] Hamp-Lyons, L., & Heasley, B. (2006). <i>Study Writing</i> . Cambridge, UK: Cambridge University Press			
	[2] Articles and Essays taken from <i>The Allyn and Bacon Guide to Writing</i> by Ramage et al (2009), Pearson Longman.			
	[3] Cormack, J. & Slau study: Extended writin Cambridge University	nght, J. (2009). <i>English for acade</i> g and research skills. Cambridge Press. Garnet Education	emic e:	
	[4] Folse, K. S. & Pugl essays. Boston: Heinle	h, T. (2010). <i>Great writing 5: Gr</i> , Cengage Learning.	reater	
	[5] Keezer, S. (Ed.) (20 <i>real-time guide</i> . New J	003). <i>Write your research report</i> Tersey: Pearson Learning Group.	: A	
	[6] Kumar, R. (2019). guide for beginners. Sa	Research methodology: A step-b age Publications	y-step	

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:

		SLO				
CLO	1	2	3	4	5	6
1						
2						
3						
4						

3. Planned learning activities and teaching methods

WEEK	CONTENT—SUGGESTED TASKS	ASSIGNMENT/ HOMEWORK
1	Orientation of the Course <u>Unit 1:</u> The Academic Writing Process Introduction	
2	<u>Unit 1:</u> The Academic Writing Process (Cont.) Thinking about writing processes Distinguishing between academic and personal styles of writing Grammar of academic discourse	HW: Task 10
3	<u>Unit 2:</u> Researching and Writing Recognizing categories and classification The language of classification The structure of a research paper	HW: Task 17
4	<u>Unit 3:</u> Fundamentals & Feedback Exploring comparison and contrast structures The language of comparison and contrast Using comparisons and contrasts to evaluate and recommend	HW: Task 12
5	<u>Unit 3:</u> Fundamentals & Feedback (Cont.) The research paper Identifying a research gap The writing process	Assignment 1: Task 20
6	<u>Unit 4:</u> Definitions, Vocabulary & Clarity The clarity principle The language of definition The place of definition The writing process	HW: Task 15
7	<u>Unit 5:</u> Generalizations, Facts and Honesty Honesty principle The language of generalization	HW: Task 13
8	Unit 5: Generalizations, Facts and Honesty (Cont.) Writing a literature review The writing process Brainstorming and clustering APA 7th Style Guidelines – see https://www.apastyle.org/	Assignment 2: Writing Literature review
	MID-TERM EXAMINATION	

9	<u>Unit 6:</u> Seeing Ideas and Sharing Texts Writing about events in time Connecting events Learning about peer reviews	HW: Tasks 12 & 13			
10	<u>Unit 7:</u> Description, Methods & Reality Describing processes and products The language for writing about processes Writing the Methods section Giving and getting formal peer feedback	HW: Tasks 9 & 11			
	Unit 8: Results, Discussion & Relevance				
11	What is an argument? The language of argument The Results and Discussion sections	HW: Task 9			
	Finding an academic voice				
12	Unit 9: The Whole Academic Text S-P-S-E: Focus on structure S-P-S-E in the introduction The language of coherence and connection Teacher evaluation Unit 10: Creating the Whole Text Structure of the research paper Creating your own	HW: Task 9			
	research				
14	<u>Unit 10:</u> Creating the Whole Text Plagiarism Creating citations Paraphrase and summary Authorial identity				
1.5		Submitting			
15	Course Review	Literature review			
	FINAL EXAM				
	FINAL EAAM				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Class participation and Assignments	80%	80%	80%	
(30%)	Pass	Pass	Pass	
	80%		80%	80%
Midterm exam (30%)	Pass		Pass	Pass

	80%	80%	80%
Final exam (40%)	Pass	Pass	Pass

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

5. Rubrics

5.1.	Midterm	exam	sample	rubrics	(100	points)
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TASK 1: 30 points

CATEGORIES	CRITERIA	POINTS	CLO
Category	Farm animals seem to have more complex cognitive and social skills	7.5	CLO 1,2
Sub-category 1	1. Sheep experience stress a. increase stress (when isolated from the flock)	7.5	
	b. reduce stress (when seeing familiar sheep faces)		
Sub-category 2	2. Cows' co-operative partnerships & physiological response on learning something	7.5	CLO 1,2
	a. Those learning tasks experience an increase in heart rate (when facing same situation).b. Those not learning tasks do not experience a heart rate increase.		
Sub-category 3	 3. Pigs' different reactions react differently based on past experience a. avoid the place where they have been shut for long b. go for the place where they were released from quickly. 	7.5	CLO 1,2
	Total	30	

TASK 2: 70 points

CATEGORIES	CRITERIA	POINTS	CLO
Content	All main points relevant to topic	20	CLO
	Essay question fully answers		1,3,4
Organization	Topic and purpose of the essay discussed in the	20	CLO
	introduction		1.3.4
	Each main point discussed in a paragraph)-)
	All main points summarized and rephrased in the		
	conclusion		
Coherence	Paragraphs ordered in a systematic manner based	15	CLO
	on, for example, importance, priority, etc.		134
	Comparison/contrast transitions are properly		1,5,7
	used.		
Style and Tone	Formal writing with full forms	15	CLO
	Polite writing		124
	Academic vocabulary		1,3,4

Total	70

5.2. Final exam rubrics: 100 points

Content• Presenting his/her view on the question clearly and persuasively20CLC 1,3,4Structure of ideas• Introduction with thesis statement, and conclusion with summary and comment • Topic sentences well supported with explanations, examples, etc.40CLC 1,3,4	rs clo
Content• Presenting his/her view on the question clearly and persuasively20CLC 1,3,-Structure of ideas• Introduction with thesis statement, and conclusion with summary and comment • Topic sentences well supported with explanations, examples, etc.40CLC 1,3,-	
clearly and persuasively1,3,4Structure of ideasIntroduction with thesis statement, and conclusion with summary and comment40• Topic sentences well supported with explanations, examples, etc.1,3,4	CLO
Structure of ideas• Introduction with thesis statement, and conclusion with summary and comment • Topic sentences well supported with explanations, examples, etc.40CLC 1,3,4ConsistenceConstructionCLC 1,3,4	1,3,4
ideasconclusion with summary and comment1,3,4• Topic sentences well supported with explanations, examples, etc.20	CLO
Topic sentences well supported with explanations, examples, etc.	1,3,4
explanations, examples, etc.	
Convincing argumentative techniques, e.g., counterargument 20 CLC	CLO
1,3,4	1,3,4
Language use:20CLC	CLO
use vocabulary and grammatical structures 1,3,4	1,3,4
Total 100	

Date revised: 15 August, 2022

Course Name: Object-Oriented Programming

Course Code: IT069IU

1. General infor	mation					
Course designation	This subject from basic r oriented sof	This subject introduces students to the object-oriented programming from basic notions to professional principles for designing an object- oriented software.				
Semester(s) in which the course is taught	3					
Person responsible for the course	Dr. Tran Th	anh Tung				
Language	English					
Relation to curriculum	Compulsory	(all programs)				
Teaching methods	Lecture, les	son, project, sen	ninar.			
Workload (incl. contact hours, self- study hours)	Total workl Contact hou session, etc. Private stud 120	oad: 195 Irs (please specif): 45 (lecture) + y including exar	fy whether lecture, exercise, laborate 30 (laboratory) nination preparation, specified in ho	ory ours:		
Credit points	Number of Lecture: 3 Laboratory:	credits: 4 1				
Required and recommended prerequisites for joining the course	Prerequisite	course of OOP:	C/C++ Programming			
Course objectives	Introduction include core oriented pro encapsulation principles, a	to object-orient terminologies a ogramming such on, inheritance, j und design patter	ted programming and design. Topics and basic design principles of object as classes, objects, abstraction, polymorphism, the SOLID design rns	-		
Course learning outcomes	CLO 1. Exp including cl polymorphi CLO 2. Imp language. CLO 3. Ana oriented pro	lain and use con asses, objects, a sm. lement an objec lyze design prin ograming	cepts in object-oriented programmin bstraction, encapsulation, inheritanc t-oriented solution in JAVA program ciples and design patterns in object-	ng e, and nming		
	Cor leve	npetency el	Course learning outcome (CLO)			

		Knowledge	CLO1		
		Skill	CLO2, CLO3		
		Attitude			
Content	The d	escription of the conte	ents should clearly ind	icate the w	veighting
	of the	content and the level.	```		
	Weigh	ht: lecture session (3 h	IOURS)	;)	
		onic	e); 1 (1each); 0 (0th	Weight	Laval
	I	upic		3	I
				2	IT
	In Pi	rogramming	Jriented	5	1, 1
	C	lasses and Objects		3	Т
	In	heritance and compos	sition	3	Т
	Po	olymorphism		3	Т
	D	esign with interfaces a	and abstract classes	3	Т
	B	uilding Objects		3	Т
	E	xception handling		3	Т
	G	eneric classes and me	thods	3	Т
	In	troduction to SOLID	principles	3	T, U
	Si	ingle responsibility pr	inciple		
	0	pen/closed principle		1.5	T, U
	Li	isko substitution princ	iple	1.5	T, U
	In	terface segregation pr	rinciple	1.5	T, U
	D	ependency inversion p	principle	1.5	T, U
	R	eusing Designs Throu	gh Design Patterns	6	T, U
Examination forms	Short-	-answer questions			
Study and	Atten	dance: A minimum at	tendance of 80 percent	t is compu	lsory for
examination	the cla	ass sessions. Students	will be assessed on the	e basis of	their class
requirements	partic	ipation. Questions and	l comments are strong	ly encoura	iged.
	Assig	nments/Examination:	Students must have m	ore than 5	0/100
Pooding list	points	S overall to pass this co	ourse.	thor) Iovo	How To
Reading list	1.	Program 11th Edition	on Prentice Hall 2017	11101 <i>)</i> , Java	110w 10
	2. Matt Weisfeld. The Object-Oriented Thought Process. 3rd				
		Edition, Addison-We	esley, 2009	-	
	3.	Erich Gamma, Richa	rd Helm, Ralph Johns	on and Jol	hn
		Vlissides, Design Pa	tterns: Elements of Re	usable Ob	ject-
		Oriented Software, A	Addison-Wesley Profe	ssional, 19	994 D 1
	4.	Eric Freeman, Bert E	sates, Kathy Sierra and	a Elisabeth	NOD SON,
		Media, 2004	aucilis. A Drain-Friend	iny Guide,	Orelly

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SL O					
CL O	1	2	3	4	5	6
1	XX					
2		XX				Х
3		XX X				Х

3.	Planned	learning	activities	and	teaching	methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to Java	1	Quiz	Lecture	[1]
2	Introduction to Object- Oriented Programming	1	Quiz	Lecture, Discussion	[1,2]
3	Classes and Objects	2	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
4	Inheritance and composition	2	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
5	Polymorphism	2	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
6	Design with interfaces and abstract classes	2,3	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
7	Building Objects	2,3	Quiz, Lab, Midterm	Lecture, Discussion, In-class exercises	[1,2]
8	Exception handling	1,2	Quiz	Lecture	[1]
9	Midterm				

10	Generic classes and methods	2,3	Quiz, Lab, Final	Lecture, Discussion, In-class exercises	[1,2]
11	Introduction to SOLID principles Single responsibility principle	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
12	Open/closed principle Lisko substitution principle	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
13	Interface segregation principle Dependency inversion principle	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
14	Reusing Designs Through Design Patterns, part 1	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
15	Reusing Designs Through Design Patterns, part 2	2,3	Quiz, Project, Final	Lecture, Discussion, In-class exercises	[1,3,4]
16	Final exam				

4. As	sessment	plan	
Assessment Type	CLO1	CLO2	CLO3
Quiz (5%)	10%		20%
Labs (10%)	30%	30%	
Midterm examination (30%)	50%	40%	
Projects/Presentations/ Report (15%)	10%		30%
Final examination (40%)		30%	50%

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports					
Student:	HW/2	HW/Assignment:			
Date:	Evalu	iator:			
	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

Ho	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	Milest	one	Benchmark
	4	3	2	1
			Issue/	
	Issue/ problem		problem to be	
	to be considered		considered	
	critically is	Issue/ problem	critically is	
	stated clearly	to be considered	stated but	
	and described	critically is	description	
	comprehensivel	stated,	leaves some	Issue/
	y, delivering all	described, and	terms	problem to be
	relevant	clarified so that	undefined,	considered
	information	understanding is	ambiguities	critically is
	necessary for	not seriously	unexplored,	stated without
Explanation of	full	impeded by	boundaries	clarification
issues	understanding.	omissions.	undetermined	or description.

			, and/ or	
			backgrounds	
			unknown.	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
	comprehensive	coherent	synthesis.	interpretation/
Evidence	analysis or	analysis or	Viewpoints	evaluation.
Selecting and	synthesis.	synthesis.	of experts are	Viewpoints of
using information	Viewpoints of	Viewpoints of	taken as	experts are
to investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	~1
	T 1 11		Identifies	Shows an
	I horoughly		several	emerging
	(systematically		relevant	awareness of
	and mothodically)		when	present
	analyzes own		witch presenting a	(sometimes
	and others'		presenting a	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions)
	evaluates the	assumptions and	others'	Begins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
•	Specific position	•	,	
	(perspective,	Specific position		
	thesis/	(perspective,		
	hypothesis) is	thesis/hypothesis		
	imaginative,) takes into	Specific	
	taking into	account the	position	Specific
	account the	complexities of	(perspective,	position
	complexities of	an issue. Others'	thesis/	(perspective,
Student's	an issue. Limits	points of view	hypothesis)	thesis/
position	of position	are	acknowledge	hypothesis) is
(perspective,	(perspective,	acknowledged	s different	stated, but 1s
thesis/hypothesis	thesis/	within position	sides of an	simplistic and
)	nypothesis) are	(perspective,	issue.	obvious.

	acknowledged. Others' points of view are	thesis/ hypothesis).		
	synthesized			
	within position			
	(perspective,			
	hypothesis)			
	nypotnesis).			
			Conclusion is	
			logically tied	
	Conclusions and		to	Conclusion is
	related outcomes	Conclusion is	information	inconsistently
	(consequences	logically tied to	(because	tied to some
	and	a range of	information	of the
	implications) are	information,	is chosen to	information
	logical and	including	fit the desired	discussed;
	informed	opposing	conclusion);	related
Conclusions and	avaluation and	related outcomes	sollie related	(consequences
conclusions and	ability to place		(consequence	and
	evidence and	and	s and	implications)
(implications	nerspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplified
consequences)	priority order.	clearly.	clearly.	

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion, sequenced material within		Organizational	
			pattern	
			(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.

	Language choices are imaginative, memorable,	Language	Language choices are	-
	and choices are compelling, thoughtful and and enhance generally the support the effectiveness of the of the		mundane and commonplace and partially support the effectiveness of the	Language choices are unclear and minimally support the effectiveness of the presentation
Language	Language in presentation is appropriate to audience.	Language in presentation is appropriate to audience.	Language in presentation is appropriate to audience.	Language in presentation is not appropriate to audience.
	Delivery			
	techniques	Delivery	Delivery	Daliyamy
	gesture eve	(posture	(posture	techniques
	contact, and	gesture, eve	gesture, eve	(posture, gesture,
	vocal	contact, and	contact, and	eve contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
5.11	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of	Common a station of	C	Insufficient
	types of	Supporting	Supporting	supporting
	supporting	materials	(avalenations	(avplanations
	(explanations	examples	examples	examples
	examples	illustrations	illustrations	illustrations
	illustrations.	statistics.	statistics.	statistics.
	statistics.	analogies.	analogies.	analogies.
	analogies,	quotations	quotations	quotations from
	quotations	from relevant	from relevant	relevant
	from relevant	authorities)	authorities)	authorities)
	authorities)	make	make	make reference
	make	appropriate	appropriate	to information or
	appropriate	reference to	reference to	analysis that
	reterence to	information or	information or	minimally
	information or	analysis that	analysis that	supports the
	analysis that	generally	partially	presentation or
	supports the	supports the	supports the	resenter's
	nresentation or	establishes the	establishes the	credibility/
Supporting	establishes the	nresenter's	nresenter's	authority on the
Material	presenter's	credibility/	credibility/	topic.

	credibility/ authority on the topic.	authority on the topic.	authority on the topic.	
	Central message is compelling (precisely stated, appropriately repeated, memorable,	Central message is clear and consistent with	Central message is basically understandable but is not often	Central message can be deduced but is not explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Assoc.Prof. Nguyen Van Sinh

Course Name: Discrete Mathematics

Course Code: IT153IU

1. General informat	ion
Course designation	The course provides students the ability to reason and think mathematically and logically; and apply this ability to analyze and solve discrete practical problems in Computer Science and IT.
Semester(s) in which the course is taught	4
Person responsible for the course	Assoc. Prof. Nguyen Van Sinh
Language	English
Relation to curriculum	Compulsory (NE, CE, CS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Total workload: 135 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) Private study including examination preparation, specified in hours: 90
Credit points	Number of credits : 3 Lecture: 3 Laboratory: 0
Required and recommended prerequisites for joining the course	C/C++ Programming Calculus 1, 2
Course objectives	This course provides students the based knowledge of discrete mathematics. To develop the ability to reason and think mathematically and logically; and to apply this ability to analyzing and solving discrete practical problems in computer science. This is an application-oriented course based upon the study of events that occur in small, or discrete in computer science, segments in business, industry, government and the digital areas. Students will be introduced to the mathematical tools of logic and set theory, counting, number theory, and graph theory. Practical applications will be introduced throughout the course
Course learning outcomes	CLO 1. Understand and apply count/enumerate objects in a systematic way. CLO 2. Understand mathematical reasoning in order to read, comprehend and construct mathematical arguments; Understand to work with discrete structures and practical problems in computer science and IT CLO 3. Apply algorithm thinking and modeling; Apply knowledge in computer science for problems solving

	CLO 4. Have a sense of preparation of good mathematical knowledges to approach and solve problems in computer science and information technology.					
		Competency level	Course learning out	come (CL	0)	
		Knowledge	CLO1, CLO2			
		Skill	CLO2, CLO3			
		Attitude	CLO4			
Content	The weig Weig Teac	description of the con- thing of the content of thing levels: I (Introd	ntents should clearly ind and the level. (teaching hours) (uce); T (Teach); U (Uti	dicate the		
	Тој	pic		Weight	Level	
	We Log	ek 1: Course syllabus gic and propositions	s and introduction;	3	I,T	
	We	ek 2: Logic and prop	ositions (continue)	3	I,T,U	
	We pre	ek 3: Propositional E dicates and quantifier	quivalences;	3	I,T,U	
	We Pro	ek 4: Nested Quantif of	3	I,T,U		
	We	ek 5: Induction and r	3	I,T,U		
	We	ek 6&7: Number of t	3	I,T,U		
	We	ek 8: Counting: part	3	I,T,U		
	We	ek 9: Counting: part	3	I,T,U		
	We	ek 10: Advanced cou	3	I,T,U		
	We	ek 11: Boolean algeb	3	I,T,U		
	We	ek 12: Graph theory	3	I,T,U		
	We	ek 13: Optimal probl	em solving on graphs	3	I,T,U	
	We	ek 14: Introduction a	nd application of tree	3	I,T,U	
	We exa	ek 15: Search on tree m	; review for final	3	I,T,U	
Examination forms	Mult	tiple-choice questions	s, short-answer question	ıs		
Study and examination	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of					
requirements	their	class participation. Q	Questions and comment	s are stron	gly	
	enco	uraged.		41	50/100	
	noin	gnments/Examination	1: Students must have h	nore than :	50/100	
Reading list	1.	Kenneth H. Rosen,	Discrete Mathematics a	and Its		
	2.	Oscar Levin, Discre	te mathematics An Ope	en Introdu	ction.	
	3	S ealtion, 2019. Vietnamese book: N	IV Sinh TM Hà NT	T Sana		
	5.	N.M.Quân, "Nền tả	ng Toán học trong Côn	g nghệ Th	ông	

tin", NXB - Đại học Quốc gia TPHCM, ISBN: 978-604-73- 6518-0, 2018
0518-0, 2018.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO							
CL	1	2	3	4	5	6		
0								
1	Х	Х						
2	Х	Х						
3		Х						
4						Х		

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Course syllabus and introduction; Logic and propositions	1,2	Questions and answers	Lecture, Discussion, In-class exercises	[1, 2]
2	Logic and propositions (continue)	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
3	Propositional Equivalences; predicates and quantifiers	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
4	Nested Quantifiers and Methods of Proof	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
5	Induction and recursion	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
6	Number of theory	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]
7	Number of theory (continue)	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2]

8	Counting: part 1, 2; midterm review	2,3,4	Quiz, Homework, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
	Midterm examination				
9	Counting: part 3	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2]
10	Advanced counting	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2]
11	Boolean algebras	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
12	Graph theory	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
13	Optimal problem solving on graphs	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
14	Introduction and application of tree	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
15	Search on tree; review for final exam	2,3,4	Quiz, Homework, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
1	Final examination				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quiz/Homework/Assignment (25%)	20%	30%	30%	20%
Midterm examination (30%)	25%	25%	25%	25%
Final examination (45%)		30%	40%	30%

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

5. Rubrics (optional)

5.1. Grading checklist
Student:	HW/	HW/Assignment:		
Date:	Evalu	Evaluator:		
		<u> </u>		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
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

Hol	istic 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
	Issue/ problem	Issue/ problem	Issue/	Issue/
	to be considered	to be considered	problem to be	problem to be
	critically is	critically is	considered	considered
	stated clearly	stated,	critically is	critically is
	and described	described, and	stated but	stated without
Explanation of	comprehensivel	clarified so that	description	clarification
issues	y, delivering all	understanding is	leaves some	or description.

[
	relevant	not seriously	terms	
	information	impeded by	undefined,	
	necessary for	omissions.	ambiguities	
	full		unexplored,	
	understanding.		boundaries	
			undetermined	
			, and/ or	
			backgrounds	
			unknown.	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	takan from	takan from		
	carrena (a) with	carrie (a) with	/ evaluation,	
	source(s) with	source(s) with	out not	Information in
	enougn	enougn	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
	comprehensive	coherent	synthesis.	interpretation/
Evidence	analysis or	analysis or	Viewpoints	evaluation.
Selecting and	synthesis.	synthesis.	of experts are	Viewpoints of
using information	Viewpoints of	Viewpoints of	taken as	experts are
to investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	
			Identifies	Shows an
	Thoroughly		several	emerging
	(systematically		relevant	awareness of
	and		contexts	present
	methodically)		when	assumptions
	analyzes own		presenting a	(sometimes
	and others'		position. May	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions).
	evaluates the	assumptions and	others'	Begins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position	position	versa)	position
	Specific position	Specific position	Specific	20010011
	(nerspective	(nerspective	nosition	Specific
Student's	thesis/	thesis/hypothesis	(nerspective	position
nosition	hypothesis) is) takes into	thesis/	(perspective
(norsnoctivo	imaginative	account the	hypothesis)	thesis/
thosis/hynothosis	taking into	complexities of	nypouresis)	hypothesis) is
)	account the	an issue Others'	s different	stated but is
1	account the	an issue. Others	5 unrerent	Stated, Out 15

	complexities of	points of view	sides of an	simplistic and
	on issue Limits			shipistic and
	all issue. Limits	alt	155uc.	oovious.
	of position			
	(perspective,	within position		
	thesis/	(perspective,		
	hypothesis) are	thesis/		
	acknowledged.	hypothesis).		
	Others' points of			
	view are			
	synthesized			
	within position			
	(perspective,			
	thesis/			
	hypothesis).			
			Conclusion is	
			logically tied	
	Conclusions and		to	Conclusion is
	related outcomes	Conclusion is	information	inconsistently
	(consequences	logically tied to	(because	tied to some
	and	a range of	information	of the
	implications) are	information,	is chosen to	information
	logical and	including	fit the desired	discussed;
	reflect student's	opposing	conclusion);	related
	informed	viewpoints;	some related	outcomes
Conclusions and	evaluation and	related outcomes	outcomes	(consequences
related	ability to place	(consequences	(consequence	and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplified
consequences)	priority order.	clearly.	clearly.	

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction			
	and conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction	pattern (specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced
	is skillful and	clearly and	transitions) is	material within
	makes the	consistently	intermittently	the body, and
	content of the	observable	observable	transitions) is not
	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.

	Language		Language	
	choices are	Language	choices are	
	imaginative.	choices are	mundane and	Language
	memorable, and	thoughtful and	commonplace	choices are
	compelling, and	generally	and partially	unclear and
	enhance the	support the	support the	minimally
	effectiveness of	effectiveness of	effectiveness of	support the
	the	the	the	effectiveness of
	presentation	presentation	presentation	the presentation
	I anguage in	I anguage in	I anguage in	I anguage in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate to
Ιαησμοσο	audience	appropriate to	appropriate to	audience
Language	Delivery		Delivery	
	techniques	Daliyary	techniques	Daliyary
	(posturo	techniques	(posturo	techniques
	(posture,	(mosture	(posture,	(maatuma gaatuma
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
		gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	datus at fusure the
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the
	speaker appears	interesting, and	and speaker	presentation, and
D P	polished and	speaker appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of	a .:	a .:	
	supporting	Supporting	Supporting	T CC ·
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations from	quotations from	quotations from	statistics,
	relevant	relevant	relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.

	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month 1

Assoc.Prof. Nguyen Van Sinh

Course Name: Computer Networks

Course Code: IT091IU

1. General mormatic	on			
Course designation	This subject covers the function networks	indamental knowledge	of comput	er
Semester(s) in which the course is taught	3,5			
Person responsible for the course	Assoc. Prof. Vo Thi Luu Phuong.			
Language	English			
Relation to curriculum	Compulsory (CS, NE, CE	2)		
Teaching methods	Lecture, lesson, project, s	eminar.		
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120			
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1			
Required and recommended prerequisites for joining the course	C/C++ Programming or H	Fundamentals of Progra	mming	
Course objectives	This course covers the fur networks such as OSI, TO LAN, WAN, the typical r study to design, implement network.	ndamental knowledge of CP/IP models, network network protocols. The nt and monitor a small	of compute architectur students w / medium	er res, vill also scale
Course learning outcomes	CLO 1. Analyze the comp computer networks; CLO 2. Apply the theory networks; CLO 3. Show the ability	ponents, architecture, a in designing a small/m to work in teams;	nd protoco edium con	ols in nputer
	Competency level	Course learning outc	come (CL	0)
	Knowledge	CLO1		
	Skill	CLO2, CLO3		
	Attitude	CLO2		
Content	The description of the con weighting of the content of Weight: lecture session (3 Teaching levels: I (Introd Topic	ntents should clearly ind and the level. 3 hours) auce); T (Teach); U (Uti	dicate the ilize) Weight	Level

	Introduction of computer networks	2	T, U
	Network applications: HTTP, FTP, DNS, SMTP	2	T, U
	Transport layer: congestion control, TCP, UDP	2	T, U
	IP addressing, CIDR, VLSM	2	T, U
	Network layer: routing algorithms, routing protocols	2	T, U
	Datalink layer and physical layer	2	T, U
	Wireless and mobile networks	2	Т
	Some advanced topics in contemporary networks	1	U
Examination forms	Multiple-choice questions, short-answer question	ns	· · ·
Study and	Attendance: A minimum attendance of 80 percent	nt is comp	oulsory
examination	for the class sessions. Students will be assessed	on the basi	is of
requirements	their class participation. Questions and comment encouraged.	ts are stroi	ngly
	Assignments/Examination: Students must have r points overall to pass this course.	nore than	50/100
Reading list	1. J. F. Kurose and K. W. Ross, Computer No Down Approach 7th, 2014	etworking	: A Top

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1	$\checkmark\checkmark$					
2		$\sqrt{\sqrt{\sqrt{1}}}$				
3					\checkmark	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1-2	Introduction of computer networks	1	Midterm	lecture	Chapter 1, [1]
3-4	Network applications: HTTP, FTP, DNS, SMTP	1	Midterm, Lab	lecture, lab	Chapter 2, [1]
5-6	Transport layer: congestion control, TCP, UDP	1	Midterm, Lab	lecture, lab	Chapter 3, [1]
	Midterm				
7-8	IP addressing, CIDR, VLSM	2	Final, Lab	lecture, lab	Chapter 4, [1]

9-10	Network layer: routing algorithms, routing protocols	1,2	Final, Lab	lecture, lab	Chapter 5, [1]
11-12	Datalink layer and physical layer	1,2	Final, Lab	lecture, lab	Chapter 6, [1]
13-14	Wireless and mobile networks	1	Final	lecture	Chapter 7, [1]
15	Some advanced topics in contemporary networks	3	Group project	group work	Literature
10	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Exercises, quizzes, attendants (10%)	30%		30%
Group project (5%)		30%	40%
Labs (25%)		30%	30%
Midterm examination (30%)	40%		
Final examination (30%)	30%	40%	

1. 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.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports				
Student:	lent: HW/Assignment:			
Date:				
	Evalu	ator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
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	
I O I ML SCORE	100	

5.2.	Holistic rubric				
Ho	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				

TT . 12.42 •

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	Milest	one	Benchmark
	4	3	2	1
	Issue/ problem to be considered critically is stated clearly and described comprehensivel	Issue/ problem to be considered critically is stated, described and	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored	Issue/
	relevant	clarified so that	boundaries	considered
	information	understanding is	undetermined	critically is
	necessary for	not seriously	, and/ or	stated without
Explanation of	full	impeded by	backgrounds	clarification
issues	understanding.	omissions.	unknown.	or description.
	taken from source(s) with enough	taken from source(s) with enough	is taken from source(s) with some	taken from source(s) without any
Evidonao	interpretation/	interpretation/	interpretation	interpretation/
			/ Evaluation,	View sints - f
Selecting and	develop a	develop a	but not	viewpoints of
using information	comprehensive	conerent	enough to	experts are
to investigate a	analysis or	analysis or	develop a	taken as fact,
point of view or	synthesis.	synthesis.	conerent	without
conclusion	Viewpoints of	Viewpoints of	analysis or	question.

	experts are	experts are	synthesis.	
	questioned	subject to	Viewpoints	
	thoroughly.	questioning.	of experts are	
		1	taken as	
			mostly fact	
			mostry fact,	
			questioning.	
			Questions	
			some	
			assumptions.	
			Identifies	Shows an
	Thoroughly		several	emerging
	(systematically		relevant	awareness of
	and		contexts	nresent
	methodically)		when	assumptions
	analyzas aym		witch	assumptions
	anaryzes own		presenting a	
	and others'	T 1	position. May	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions).
	evaluates the	assumptions and	others'	Begins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position	position	versa)	position
	Specific position	poblici	(0150)	position
	(normostivo			
	(perspective,			
	thesis/			
	hypothesis) is			
	ımagınatıve,			
	taking into			
	account the			
	complexities of	Specific position		
	an issue. Limits	(perspective,		
	of position	thesis/hypothesis		
	(perspective.) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged	an issue Others'	nosition	Specific
	Others' points of	noints of view	(perspective	position
	view ere	points of view	thesis/	
Standors 41 -	view are			(perspective,
Student's	synthesized	acknowledged	nypotnesis)	
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesis	thesis/	thesis/	sides of an	simplistic and
)	hypothesis).	hypothesis).	issue.	obvious.

			r	r
			Conclusion is	
			logically tied	
	Conclusions and		to	Conclusion is
	related outcomes	Conclusion is	information	inconsistently
	(consequences	logically tied to	(because	tied to some
	and	a range of	information	of the
	implications) are	information,	is chosen to	information
	logical and	including	fit the desired	discussed;
	reflect student's	opposing	conclusion);	related
	informed	viewpoints;	some related	outcomes
Conclusions and	evaluation and	related outcomes	outcomes	(consequences
related	ability to place	(consequences	(consequence	and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplified
consequences)	priority order.	clearly.	clearly.	

Augl	annuniantion	value nubrie	for	Inatina	nuccontation	tacka.
Orai	communication	value rubric	jor evi	uuuung	presentation	iusks.

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction			
	and conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction	pattern (specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced
	is skillful and	clearly and	transitions) is	material within
	makes the	consistently	intermittently	the body, and
	content of the	observable	observable	transitions) is not
	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.
	Language	-	Language	
	choices are	Language	choices are	-
	imaginative,	choices are	mundane and	Language
	memorable, and	thoughtful and	commonplace	choices are
	compelling, and	generally	and partially	unclear and
	enhance the	support the	support the	minimally
	effectiveness of	effectiveness of	effectiveness of	support the
	the	the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
I anouago	appropriate to	appropriate to	appropriate to	not appropriate to
Language	audience.	audience.	audience.	audience.

	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling and	presentation	understandable	of the
	speaker appears	interesting and	and speaker	presentation and
	speaker appears	speaker oppears	and speaker	speaker oppears
Daliman	polisieu aliu	speaker appears	appears	speaker appears
Denvery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations	(explanations	(explanations	supporting
	examples	examples	examples	materials
	illustrations	illustrations	illustrations	(explanations
	statistics	statistics	statistics	examples
	analogies	analogies	analogies	illustrations
	analogics,	analogics,	analogics,	statistics
				statistics,
				analogies,
	authorities)	authorities)	authorities)	quotations from
	таке	таке	таке	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.

1				
	Central			
	message is			
	compelling			
	(precisely		Central	
	precisely		Celluar	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month =

Assoc.Prof. Nguyen Van Sinh

Course Name: Calculus 2

Course Code: MA003IU

1. General information

Course designation	This course is a continuation of Calculus 1. Its aim to equip student with basis concepts of sequence, series, vector functions, functions of several variables, multiple integrals and their applications					
Semester(s) in which the course is taught	1, 2					
Person responsible for the course	Assoc. Prof.Mai Duc Thanh, Assoc. Prof. Tran Vu Khanh, Dr. Nguyen Minh Quan, Dr. Nguyen Anh Tu, Dr. Ta Quoc Bao.					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lectures, assignments					
Workload (incl. contact hours, self- study hours)	 (Estimated) Total workload: 120 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 60 (lectures) Private study including examination preparation, specified in hours⁶: 60 					
Credit points	4					
Required and recommende d prerequisites for joining the course	Calculus 1					
Course objectives	4. To provide students with the main ideas and techniques of calculus. These include sequences, series, functions of several variables, optimal problems, multiple integrals, vector calculus.					
	5. To introduce practical applications of these ideas and techniques, through practical examples taken from many areas of engineering, business, and life sciences.					
	6. To develop skills in mathematical modelling and problem solving, ability to think logically, and adapt these skills creatively to new situations					

⁶ 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	Upon the success	ful completion of this course students will be able to:			
learning	Competency	Course learning outcome (CLO)			
outcomes	level				
	Knowledge	CLO1. Have basic knowledge of series, functions of several variables, mupliple integrals (Program outcomes: a)			
		CLO2. Have basic knowledge of vector calculus (Program outcomes: a)			
	Skill	CLO3. Can compute partial derivatives, multiple integral (Program outcomes: a, j) CLO4. Can show the convergence of a sequence and a series and u, se power series to simplify computation. Can show the optimal problem using partial derivaties, can find the volume of an object in higher dimension by using the multiple integrals (Program outcomes: i, h)			
	Attitude	CLO5. Confident when dealing with partial derivaties, multiple integrals. Comfortable with using partial derivatives and multiple integrals in practical situations. (Program outcome: j, k)			

Content	The description of the contents should clearly indicate the weighting of the content and the level.						
	Weight: lecture session (4 hours)						
	Teaching levels: I (Introduce); T (Teach); U (Utilize)						
	Торіс	Weigh t	Leve l				
	Sequences and Convergence	1	I, T				
	Series	1	I, T				
	Tests for Convergence	1	T, U				
	Power series	1	T, U				
	Representations of Functions as Power series	1	T, U				
	Taylor and Maclaurin series	1	T, U				
	Vector Functions and Space Curves, Limit and continuity of vector functions	1	I, T				
	Derivatives and Integrals of vector functions, Length of space curves	1	T, U				
	Functions of Several Variables, Limits and Continuity	1	I,T				
	Partial Derivatives, Tangent Plane and Linear Approximations	1	T, U				
	Chain Rules, Directional Derivatives and Gradient	1	T, U				
	Maximum and Minimum Values of Functions of two variables	1	T, U				
	Lagrange Multipliers and Applications	1	T, U				
	Double Integrals in Rectangles, Iterated Integrals	1	I, T				
	Double, Triple Integrals in General regions and Applications	2	T,U				
Examination forms	Written 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 overall to pass this course.	re than 50	/100 points				
Reading list	J. Stewart, Calculus, Thomson Learning, 7th edition	n, 2012.					

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:

		PLO									
CLO	а	b	c	d	e	f	g	h	i	j	k
1	Х										
2	Х										
3										X	
4										Х	
5										X	X

3. Planned learning activities and teaching methods

Week	Topics	CLO	Assessment	Teaching and
				Learning activitie
1	Sequences, Series, The Integral Test and Estimates Sums, Thecomparison Tests	2, 4	HW	Lectures and Quiz
2	Alternating Series, Absolute Convergence and the Ratio and Roots Tests, Strategy for Testing Series	2, 4	HW	Lectures and Quiz
3	Power Series, Representations of Functions as Power Series, Taylor & Maclaurin Series, Applications of Taylor Polynomials	4, 5	Quiz	Lectures and Quiz
4	3D Coordinate Systems, Vectors, The Dot Product, The Cross Product, Equations of Lines and Planes, Functions of Surface.	2, 4	HW	Lectures and Quiz
5	Vector Functions and Space Curves, Derivaties and Integrals of Vector Functions, Arc Length, Parametric Surfaces	4, 5	HW	Lectures and Quiz
6	Functions of Several Variables, Limit and Continuty,	2, 4, 5	Quiz	Lectures and Quiz
7	Partial Derivatives, Tangent Plances and Linear Approximations,	3, 5	HW	Lectures and Quiz
8	Chain Rule, Directional Derivaties and Gradient Vectors,	3, 5	HW	Lectures and Quiz
Midter	m Exam			
9	Maximun and Minimun Values, Larange Multipliers	2, 4	HW	Lectures and Quiz
10	Double Integrals over Rectangles, Iterated Integrals, Double Integrals over General Regions	2, 4	HW	Lectures and Quiz

11	Double Integrals in Polar Coordinates, Application of Double Integrals.	4, 5	HW	Lectures and Quiz
12	Triple Integrals, Triple Integrals in Cylindrical and Spherial Coordinates. Change of Variables in Multiple Integrals	2, 4	Quiz	Lectures and Quiz
13	Vector Fields, Line Integrals, the Fundamental Theorem for Line Integrals	4, 5	HW	Lectures and Quiz
14	Green's Theorem, Curl and Divergence, Surface Integrals	2, 4, 5	HW	Lectures and Quiz
15	Stokes' Theorem, Divergence Theorem.	1, 2, 3, 4	Exercises	
Final H	Exam			

4. Assessment plan

Assessment	CLO1	CLO2	CLO3	CLO4	CLO5
Туре					
In-class	Qz1->Qz4	Qz5->Qz8	Qz1->Qz4	Qz5->Qz8	Qz2, 4, 6, 8
exercises/	80% Pass	80%Pass	80% Pass	80% Pass	70% Pass
quizzes					
(10%)					
Homework	HW1->H3	HW4, HW5	HW1-	HW4, HW5	
exercises	70% Pass	70%	>HW3 70%	70%	HW1-
(10%)			Pass		>HW5
					60% Pass
Midterm exam	Q1, Q2		Q3, Q4		Q5
(30%)	80% Pass		70% Pass		50%
Final exam		Q1, Q2		Q3, Q4	Q5
(50%)		80%Pass		70%Pass	50%

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

Course Name: Linear Algebra

Course Code: IT154IU

1. General information

Course designation	Linear algebra provides a mathematical framework for organizing information and then using that information to solve problems, especially data analytics problems. Linear algebra is essential for understanding and creating machine learning algorithms, especially neural network and deep learning models.
Semester(s) in which the course is taught	2, 3
Person responsible for the course	Mai Hoang Bao An, PhD.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, demo.
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 135 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) Private study including examination preparation, specified in hours: 90
Credit points	Number of credits: 3 Lecture: 3 Laboratory: 0
Required and recommended prerequisites for joining the course	Calculus 2
Course objectives	This course will provide students with the foundations of linear algebra knowledge necessary for machine learning and neural network modelling. Students will learn the overview of basic matrices and vector algebra as applied to linear systems. Then they will learn how to manipulate matrices to derive useful knowledge from data, quantify the degree of learning, and optimizing the speed of learning in vector spaces and linear transformations for data discovery. The hands-on lessons and assignments will equip students with the mathematical background required to build and train simple neural networks in data mining applications.
Course learning outcomes	CLO 1. Understand concepts of vector space, matrices, tensor, linear system and their application in other fields of study. Get familiar with the fundamental concepts of linear spaces. CLO 2. Know how to use Python to handle with matrices and linear systems. Get to know and understand the fundamental concepts of abstract vector spaces and their relationships with matrix algebra.

	 CLO 3. Understand the concepts and applications of linear dependence/independence, spans and linear transformation. Apply principles of matrix algebra to linear transformation. Understand the Isomorphic Vector Spaces and applications. CLO 4. Determine eigenvalues and eigenvectors and solve eigenvalue problems. Introduction to determinant and its properties and applications. The use case of carrying out matrix operations in machine learning. 					
	Competency level Course learning out	come (CL	0)			
	Knowledge CLO 1, CLO 2, CLO	3, CLO 4				
	Skill CLO 2, CLO 4					
	Attitude CLO 1, CLO 2, CLO	3, CLO 4				
Content	<i>The description of the contents should clearly ind</i> <i>weighting of the content and the level.</i> Weight: lecture session (3 hours) Teaching levels: I (Introduce): T (Teach): U (Uti	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours)				
		Weight	Level			
	Introduction to python, colab What is linear structures	1	I, U			
	Fundamentals and geometry of R ⁿ space Matrix algebra: vectors, matrices. Linear systems, parametric equations and systems of linear equations	2	T, U			
	Solving systems of linear equations Subspace of \mathbb{R}^n , linear independence, base and dimension in \mathbb{R}^n Python in linear algebra					
	Solving linear system with numpy Norm in \mathbb{R}^n with Python	1	T, U			
	Abstract vector spaces, base and dimension for abstract vector spaces. Special kinds of matrices and vectors.	1	T, U			
	Span in abstract vector spaces. Fundamentals of linear transformations. Demo of linear transformations in Python.	2	T, U			
	Linear Transformation in abstract vector space Linear Transformation and Inverses	1	T, U			
	Geometric Transformation of Plane, Image and Kernel, Isomorphism and linear map Isomorphic Vector Spaces	1	I, T, U			
	Introduction to determinant Determinant expansions. Properties of determinant.	1	I, T			
	Elementary Row Operations and the Determinant	2	I, T, U			

	Eigenvectors and Eigenvalues, Eigen- decompositionsIntroduction to some application of linear				
	algebra: PCA, OLS,				
Examination forms	Short-answer questions, Long-answer questions, programming questions				
Study and	Attendance: A minimum attendance of 80 percent is compulsory				
examination	for the class sessions. Students will be assessed on the basis of				
requirements	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. R.O. Hill, Elementary Linear Algebra and Its applications, 3rd edition				
	2. B. Kolman and David R. Hill, Introductory Linear Algebra: An Applied First Course (8th edition, 9th edition)				
	3. Jim Hefferon, Linear Algebra, 4th edition.				
	4. github: Python in linear algebra, matrix computing.				

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х					
2		X				
3		X	X			
4			X			

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to python, colab What is linear structures Introduction to matrix	1		Lecture, Discussion	[1, 2, 3]. Chapter 1
2-3	Fundamentals and geometry of \mathbb{R}^n space Matrix algebra: vectors, matrices. Linear systems, parametric equations and systems of linear equations	1	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 2, 3, 4
4-5	Solving systems of linear equations	1, 2	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 4, 5, 6

	Subspace of \mathbb{R}^n , linear independence, base and dimension in \mathbb{R}^n Python in linear algebra				[4] Chapter 1,2,3
6	Solving linear system with numpy Norm in \mathbb{R}^n with Python	1, 2		Lecture, In-class Discussion	[4]. Chapter 3, 4, 5
7	Abstract vector spaces, base and dimension for abstract vector spaces. Special kinds of matrices and vectors.	1, 2	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 6, 7, 8
8	Midterm				
9-10	Span in abstract vector spaces. Fundamentals of linear transformations. Demo of linear transformations in Python.	3, 4	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 8, 9, 10 [4] Chapter 6, 7
11	Linear Transformation in abstract vector space Linear Transformation and Inverses	3	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 10, 11, 12
12	Geometric Transformation of Plane, Image and Kernel, Isomorphism and linear map Isomorphic Vector Spaces	3	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 11, 12, 13
13	Introduction to determinant Determinant expansions. Properties of determinant	3, 4	Quiz	Lecture, In-class Quiz	[1, 2]. Chapter 13. 14, 15
14-15	Elementary Row Operations and the Determinant Eigenvectors and Eigenvalues, Eigen- decompositions Introduction to some application of linear algebra: PCA, OLS,	3, 4	Exercises	Lecture, In-class exercises	[2, 3]. Chapter 14, 15, 16 [4] Chapter 8, 9, 10
16	Revision			Review-test	
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (20%)	25%	25%	25%	25%

Midterm examination (30%)	50%	50%		
Projects/Presentations/ Report (10%)			50%	50%
Final examination (40%)		25%	25%	50%

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

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.
 5. Rubrics (optional)

5.1. Grading checklist								
Grading checklist for Written Reports								
Student:	HW/Assignment:							
Date:	•••••		••					
	Evalu	lator:						
	Max.	Score	Comments					
Technical content (60%)								
Abstract clearly identifies purpose and summarizes	10							
principal content								
Introduction demonstrates thorough knowledge of	15							
relevant background and prior work								
Analysis and discussion demonstrate good subject	30							
mastery								
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%)								
TOTAL SCORE	100							

5.1. Grading checklist

5.2. Holistic rubric

Hol	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.

Cruicai ininking va	Capstone	Milest	one	Benchmark
	4	3	2	1
	T	U		I
			nrohlam to be	
			considered	
	T (11		critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	
	comprehensivel	stated,	ambiguities	Issue/
	y, delivering all	described, and	unexplored,	problem to be
	relevant	clarified so that	boundaries	considered
	information	understanding is	undetermined	critically is
	necessary for	not seriously	and/ or	stated without
Explanation of	full	impeded by	hackgrounds	clarification
issues	understanding	omissions	unknown	or description
155005	understanding.	01115510115.	Information	of description.
			in takan from	
			is taken from	
			source(s)	
		.	with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
	comprehensive	coherent	synthesis.	interpretation/
Evidence	analysis or	analysis or	Viewpoints	evaluation.
Selecting and	synthesis.	synthesis.	of experts are	Viewpoints of
using information	Viewpoints of	Viewpoints of	taken as	experts are
to investigate a	experts are	experts are	mostly fact.	taken as fact.
point of view or	auestioned	subject to	with little	without
conclusion	thoroughly.	questioning.	auestioning.	question.
•••••••	Thoroughly	1	Questions	4
	(systematically		some	Shows an
	and		assumptions	emerging
	methodically)		Identifies	awareness of
	analyzas aym			awarchess of
	anaryzes own		several	present
	and others	T.1	relevant	assumptions
	assumptions and	identifies own	contexts	(sometimes
	carefully	and others'	when .	labels
	evaluates the	assumptions and	presenting a	assertions as
	relevance of	several relevant	position. May	assumptions).
Influence of	contexts when	contexts when	be more	Begins to
context and	presenting a	presenting a	aware of	identify some
assumptions	position.	position.	others'	contexts when

5.3. Analytic rubric *Critical thinking value rubric for evaluating questions in exams:*

			assumptions	presenting a
			than one's	position.
			own (or vice	
			versa).	
	Specific position			
	(perspective,			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	account the	Spacific position		
	complexities of	(perspective		
	all issue. Limits	thesis/hypothesis		
	(perspective) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged	an issue Others'	position	Specific
	Others' points of	noints of view	(nerspective	position
	view are	are	thesis/	(nerspective
Student's	synthesized	acknowledged	hypothesis)	thesis/
nosition	within position	within position	acknowledge	hypothesis) is
(nersnective.	(perspective	(perspective	s different	stated but is
thesis/hypothesis	thesis/	thesis/	sides of an	simplistic and
)	hypothesis).	hypothesis).	issue.	obvious.
		,	Conclusion is	
			logically tied	
	Conclusions and		to	Conclusion is
	related outcomes	Conclusion is	information	inconsistently
	(consequences	logically tied to	(because	tied to some
	and	a range of	information	of the
	implications) are	information,	is chosen to	information
	logical and	including	fit the desired	discussed;
	reflect student's	opposing	conclusion);	related
Constructions	informed	viewpoints;	some related	outcomes
Conclusions and	evaluation and	related outcomes	outcomes	(consequences
related	additive to place	(consequences	(consequence	and implications)
(implications	evidence and	implications) are	s and implications)	implications)
and	discussed in	identified	are identified	arc
consequences)	priority order.	clearly.	clearly.	

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks:

Capstone	Mile	Benchmark	
4	3	2	1

	Organizational			
	pattern (specific			
	introduction			
	and conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction	pattern (specific	
	the body, and	and conclusion.	introduction	Organizational
	transitions) is	sequenced	and conclusion.	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body and	material within	conclusion
	observable and	transitions) is	the body and	sequenced
	is skillful and	clearly and	transitions) is	material within
	makes the	consistently	intermittently	the body and
	content of the	observable	observable	transitions) is not
		within the	within the	abaamabla within
Organization	presentation		within the	the presentation
Organization	conesive.	presentation.	presentation.	the presentation.
	Language	т	Language	
	choices are	Language	choices are	т
	imaginative,	choices are	mundane and	Language
	memorable, and	thoughtful and	commonplace	choices are
	compelling, and	generally	and partially	unclear and
	enhance the	support the	support the	minimally
	effectiveness of	effectiveness of	effectiveness of	support the
	the	the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate to
Language	audience.	audience.	audience.	audience.
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the
	speaker appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations,	(explanations,	materials
	materials	examples,	examples,	(explanations,
	(explanations,	illustrations,	illustrations,	examples,
	examples,	statistics,	statistics,	illustrations,
	illustrations,	analogies,	analogies,	statistics,
Supporting	statistics,	quotations from	quotations from	analogies,
Material	analogies,	relevant	relevant	quotations from

	quotations from	authorities)	authorities)	relevant
	relevant	make	make	authorities) make
	authorities)	appropriate	appropriate	reference to
	make	reference to	reference to	information or
	appropriate	information or	information or	analysis that
	reference to	analysis that	analysis that	minimally
	information or	generally	partially	supports the
	analysis that	supports the	supports the	presentation or
	significantly	presentation or	presentation or	establishes the
	supports the	establishes the	establishes the	presenter's
	presentation or	presenter's	presenter's	credibility/
	establishes the	credibility/	credibility/	authority on the
	presenter's	authority on the	authority on the	topic.
	credibility/	topic.	topic.	
	authority on the			
	topic.			
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

TT

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Algorithms and Data Structure

Course Code: IT013IU

1. General Information								
Course designation	Thi alg	s subjec. orithms	t introduces :	students to	basic data	structur	es and	
Semester(s) in which the course is taught	4,6							
Person responsible for the course	Dr.	Tran Tl	hanh Tung					
Language	Eng	glish						
Relation to curriculum	Co	mpulsor	y (All progra	ms)				
Teaching methods	Lec	ture, les	sson, project,	seminar.				
Workload (incl.	Total workload: 195							
contact hours, self-	Contact hours (please specify whether lecture, exercise,							
study hours)	lab	oratory	session, etc.):	45 (lectur	e) + 30 (la)	boratory	7) 	
	Priv	vate stud	ly including of	examinatio	n preparat	ion, spec	cified in	l
Credit points	Number of credits : 4							
Credit points	Lecture: 3							
	Lał	ooratory	:1					
Required and	Ob	ject-Ori	ented Program	nming				
recommended			_	-				
prerequisites for								
joining the course								
Johning the course								
Course objectives	Intr	oductio	n to data stru	ctures and	algorithms	s, includ	ing their	r
Course objectives	Intr des	oductio ign, ana	n to data stru lysis, and im	ctures and plementation	algorithms on.	s, includ	ing their	r
Course objectives Course learning	Intr des CL	oductio ign, ana O 1. Un	n to data stru lysis, and imp derstand basi	ctures and plementation c data strue	algorithms on. ctures and	s, includ algorith	ing their ms	r
Course objectives Course learning outcomes	Inti des CL CL	roductio ign, ana O 1. Un O 2. An	n to data stru lysis, and im derstand basi alyze and eva	ctures and plementation c data structure aluate data	algorithms on. ctures and structures	s, includ algorith and algo	ing their ms prithms.	r
Course objectives Course learning outcomes	Intu des CL CL CL	roductio ign, ana O 1. Un O 2. An O 3. De	n to data stru lysis, and im derstand basi alyze and eva sign algorithr	ctures and plementation c data struct aluate data ms and sele	algorithms on. ctures and structures ect data str	s, includ algorith and algo uctures	ing their ms orithms. for real	r
Course objectives Course learning outcomes	Intu des CL CL CL wor	roductio ign, ana O 1. Un O 2. An O 3. De rld appli	n to data stru lysis, and im derstand basi alyze and eva sign algorithm cations.	ctures and plementation c data structure aluate data ns and sele	algorithms on. ctures and structures ect data str	s, includ algorith and algo uctures	ing their ms prithms. for real	r
Course objectives Course learning outcomes	Intu des CL CL CL wo	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Comp	n to data stru lysis, and imp derstand basi alyze and eva sign algorithr ications. etency level	ctures and plementation c data struct aluate data ms and sele Course le	algorithms on. ctures and structures ect data str earning ou	s, includ algorith and algo uctures f	ing their ms prithms. for real	r
Course objectives Course learning outcomes	Intu des CL CL CL wo	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Compo Knowl	n to data stru lysis, and imp derstand basi alyze and eva sign algorithr ications. etency level edge	ctures and plementation c data structure aluate data ms and selecture Course loc CLO1	algorithms on. ctures and structures ect data str earning ou	s, includ algorith and algo uctures f itcome (ing their ms prithms. for real (CLO)	r
Course objectives Course learning outcomes	Intu des CL CL CL wo	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Compo Knowl Skill	n to data stru lysis, and imp derstand basi alyze and eva sign algorithm ications. etency level edge	ctures and plementation c data struct aluate data ns and sele Course le CLO1 CLO2, Cl	algorithms on. ctures and structures ect data str earning ou	s, includ algorith and algo uctures f	ing their ms prithms. for real (CLO)	r
Course objectives Course learning outcomes	Intu des CL CL CL wo	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Compo Knowl Skill Attitud	n to data stru lysis, and im derstand basi alyze and eva sign algorithr ications. etency level edge	ctures and plementation c data structure aluate data ms and selecture CLO1 CLO2, Cl CLO3	algorithms on. ctures and structures ect data str earning ou LO3	s, includ algorith and algo uctures f	ing their ms prithms. for real	
Course objectives Course learning outcomes Content	Intu des CL CL CL wor	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Compo Knowl Skill Attitud	n to data stru lysis, and im derstand basi alyze and eva sign algorithr ications. etency level edge	ctures and plementation c data struct aluate data ns and sele CLO1 CLO2, Cl CLO3 cntents sho	algorithms on. ctures and structures ect data str earning ou LO3 <i>uld clearly</i>	s, includ algorith and algo uctures f itcome (ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL Wot	oductio ign, ana O 1. Un O 2. An O 3. De rld appli Compo Knowl Skill Attitud e descrip ghting o	n to data stru lysis, and im derstand basi alyze and eva sign algorithr ications. etency level edge le ption of the co	ctures and plementation c data structure aluate data ms and selecture CLO1 CLO2, Cl CLO3 cntents sho and the let	algorithms on. ctures and structures ect data str earning ou LO3 <i>uld clearly</i> <i>vel</i> .	s, includ algorith and algo uctures f itcome (ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL Woy	oductio ign, ana O 1. Un O 2. An O 3. De rld appli Compo Knowl Skill Attitud e descrip ghting o ight: lec	n to data stru lysis, and im derstand basi alyze and eva sign algorithmications. etency level edge le <i>ption of the content</i> sture session	ctures and plementation c data structure aluate data ms and selecture CLO1 CLO2, Cl CLO3 cntents sho and the letture (3 hours)	algorithms on. ctures and structures ect data str earning ou LO3 <i>uld clearly</i> <i>vel</i> .	s, includ algorith and algo uctures f itcome (<i>indicat</i>	ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL Wor <i>The</i> <i>wei</i> We Tea	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Comp Knowl Skill Attitud e descrip ghting o ight: lec uching le	n to data stru lysis, and im- derstand basi alyze and eva sign algorithr ications. etency level edge le of the content sture session evels: I (Intro	ctures and plementation c data structure aluate data ms and selecture CLO1 CLO2, Cl CLO3 cntents sho and the lev (3 hours) duce); T (1	algorithms on. ctures and structures ect data str earning ou LO3 <i>uld clearly</i> <i>vel</i> . Feach); U (s, includ algorith and algo uctures f itcome (<i>indicat</i> (Utilize)	ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL Wot <i>The</i> <i>wei</i> We Tea	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Comp Knowl Skill Attitud ghting c ight: lec iching le	n to data stru lysis, and impleterstand basi alyze and eva sign algorithmications. etency level edge le <i>otion of the content</i> sture session (evels: I (Intro Topic	ctures and plementation c data structure aluate data ns and selecture CLO1 CLO2, Cl CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3	algorithms on. ctures and structures ect data str earning ou LO3 <i>uld clearly</i> <i>vel.</i> Feach); U (Weight	s, includ algorith and algo uctures f itcome (<i>itcome</i> (<i>indicat</i> (Utilize) Level	ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL CL wor <i>The</i> <i>wei</i> We Tea	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Comp Knowl Skill Attitud e descrip ghting o ight: leo iching le	n to data stru ilysis, and im- iderstand basi alyze and eva sign algorithr ications. etency level edge le of the content sture session evels: I (Intro Topic Review OO	ctures and plementation c data structure aluate data ms and selecture CLO1 CLO2, Cl CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3	algorithms on. ctures and structures ect data str earning ou LO3 uld clearly vel. Feach); U (Weight 3	s, includ algorith and algo uctures f itcome (<i>itcome</i> (<i>indicat</i> (Utilize) Level I	ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL Wot <i>The</i> <i>wei</i> We Tea	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Comp Knowl Skill Attitud ghting o ight: lec	n to data stru lysis, and impletention alyze and eva sign algorithmications. etency level edge le of the content sture session (evels: I (Intro Topic Review OO Arrays	ctures and plementation c data structure aluate data ms and selecture CLO1 CLO2, Cl CLO3 contents sho and the lev (3 hours) duce); T (1 P & Java	algorithms on. ctures and structures ect data str earning ou LO3 uld clearly vel. Teach); U (Weight 3 3	s, includ algorith and algo uctures f itcome (<i>itcome</i> (<i>indicat</i> (Utilize) Level I T	ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL Woi <i>The</i> <i>wei</i> We Tea	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Comp Knowl Skill Attitud ghting of ight: lec	n to data stru lysis, and impleterstand basi alyze and eva sign algorithmications. etency level edge le <i>otion of the content</i> sture session of evels: I (Intro Topic Review OO Arrays Complexity	ctures and plementation c data structure aluate data ms and selecture CLO1 CLO2, Cl CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3	algorithms on. ctures and structures ect data str earning ou LO3 uld clearly vel. Teach); U (Weight 3 3 3	s, includ algorith and algo uctures f itcome (<i>itcome</i> (<i>indicat</i> (Utilize) Level I T T	ing their ms prithms. for real (CLO)	
Course objectives Course learning outcomes Content	Intu des CL CL Wo <i>The</i> <i>wei</i> We Tea	roductio ign, ana O 1. Un O 2. An O 3. De rld appli Comp Knowl Skill Attitud ghting c ight: lec uching le	n to data stru ilysis, and impletention aderstand basi alyze and eva sign algorithmications. etency level edge le bion of the content sture session evels: I (Intro Topic Review OO Arrays Complexity Sorting	ctures and plementation c data structure aluate data ns and selecture CLO1 CLO2, Cl CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3 CLO3	algorithms on. ctures and structures ect data str earning ou LO3 uld clearly vel. Teach); U (Weight 3 3 3 3	s, includ algorith and algo uctures f itcome (<i>itcome</i> (<i>indicat</i> (Utilize) Level I T T T, U	ing their ms prithms. for real (CLO)	

1. General informatio

		List	6	Т	
		Recursion	3	T, U	
		Advanced Sorting	6	Т	
		Binary Tree	3	Т	
		Hash Table	3	Т	
		Graphs	3	Т	
		Algorithms on graphs	3	T, U	
Examination forms	Short-ansv	ver questions			
Study and examination	Attendance	e: A minimum attendanc	e of 80 pe	ercent is	
requirements	compulsor	y for the class sessions.	Students v	vill be as	ssessed on
	the basis o	f their class participation	. Question	ns and co	omments
	are strongl	y encouraged.			
	Assignmen	nts/Examination: Student	ts must ha	ve more	than
	50/100 poi	nts overall to pass this co	ourse.		
Reading list	1. Michael T. Goodrich and Roberto Tamassia. Data				
	Struc	tures and Algorithms in	Java 6th,	2014	
	2. Corn	nen. Thomas H., et al. In	troduction	n to algo	rithms.
	MIT press, 2009.				
	3. Lafo	re, Robert. Data structure	es and alg	orithms	in Java.
	Same	s publishing, 2017.	0		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	XX					
2		XXX				
3						Х

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Review OOP & Java	1	Quiz	Lecture	
2	Arrays	1	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
3	Complexity	2	Quiz	Lecture, Discussion	[2]
4	Sorting	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]

5	Queue Stack	2.3	Lab. Quiz.	Lecture.	[1.3]
5	Queue, Stack	2,5	Midterm	Discussion.	
				In class exercises	
6	List part 1	1,2	Lab, Quiz,	Lecture,	[1,3]
	1		Midterm	Discussion,	
				In class exercises	
7	List part 2	2,3	Lab, Quiz,	Lecture,	
	•		Midterm	Discussion	
8	Recursion	2,3	Lab, Quiz,	Lecture,	[1,3]
			Midterm	Discussion,	
				In class exercises	
9	Midterm				
10	Advanced Sorting	1,2	Lab, Quiz, Final	Lecture,	[1,3]
-	part 1		-	Discussion,	
	1			In class exercises	
11	Advanced Sorting	2,3	Lab, Quiz, Final	Lecture,	[1,2,3]
	part 2			Discussion	
12	Binary Tree	1,2	Lab, Quiz, Final	Lecture,	[1,3]
	5			Discussion,	
				In class exercises	
13	Hash Table	2,3	Lab, Quiz, Final	Lecture,	[1,3]
				Discussion	
14	Graphs	1,2	Lab, Quiz, Final	Lecture,	[2,3]
	-			Discussion,	
				In class exercises	
15	Algorithms on	2,3	Lab, Quiz, Final	Lecture,	[2,3]
	graphs			Discussion	
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz (5%)	20%	5%	
Labs (10%)		10%	
Midterm examination (30%)	40%	30%	30%
Projects/Presentations/ Report (15%)		15%	40%
Final examination (40%)	40%	40%	30%

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

5. Rubrics (optional) 5.1. Grading checklist			
Grading checklist for Wi	ritten Repoi	rts	
Student:	HW/A	Assignme	nt:
Date:	Evalu	ator:	
	Max.	Score	Comments
Technical content (60%)			

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Abstract clearly identifies purpose and summarizes principal content	10	
Introduction demonstrates thorough knowledge of	15	
relevant background and prior work		
Analysis and discussion demonstrate good subject	30	
mastery		
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

Hol	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	Milest	one	Benchmark
	4	3	2	1
	Issue/ problem to be considered critically is stated clearly and described comprehensivel y, delivering all relevant information	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored.	Issue/ problem to be considered critically is
	necessary for	not seriously	boundaries	stated without
Explanation of	full	impeded by	undetermined	clarification
issues	understanding.	omissions.	, and/ or	or description.

			backgrounds	
			unknown	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	avaluation to	avaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
	comprehensive	coherent	synthesis	interpretation/
Fyidanca	analysis or	analysis or	Viewpoints	evaluation
Selecting and	synthesis	synthesis	of experts are	Viewpoints of
using information	Viewpoints of	Viewpoints of	taken as	experts are
to investigate a	experts are	experts are	mostly fact	taken as fact
noint of view or	auestioned	subject to	with little	without
conclusion	thoroughly	guestioning	questioning	question
conclusion	thoroughry.	questioning.	Questions	question.
			some	
			assumptions	
			Identifies	Shows an
	Thoroughly		several	emerging
	(systematically		relevant	awareness of
	and		contexts	nresent
	methodically)		when	assumptions
	analyzes own		nresenting a	(sometimes
	and others'		presenting a	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions)
	evaluates the	assumptions and	others'	Regins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific position	Specific position		· · · · · · · · · · · · · · · · · · ·
	(perspective.	(perspective.		
	thesis/	thesis/hypothesis	Specific	
	hypothesis) is) takes into	position	Specific
	imaginative,	account the	(perspective,	position
	taking into	complexities of	thesis/	(perspective,
Student's	account the	an issue. Others'	hypothesis)	thesis/
position	complexities of	points of view	acknowledge	hypothesis) is
(perspective,	an issue. Limits	are	s different	stated, but is
thesis/hypothesis	of position	acknowledged	sides of an	simplistic and
)	(perspective,	within position	issue.	obvious.

	thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective,	(perspective, thesis/ hypothesis).		
	thesis/ hypothesis)			
	hypothesis).		Conclusion is	
	Conclusions and		to	Conclusion is
	related outcomes	Conclusion is	information	inconsistently
	(consequences	logically tied to	(because	tied to some
	and	a range of	information	of the
	implications) are	information,	is chosen to	information
	logical and	including	fit the desired	discussed;
	reflect student's	opposing	conclusion);	related
C 1 · 1	informed	viewpoints;	some related	outcomes
Conclusions and	evaluation and	related outcomes	outcomes	(consequences
related	ability to place	(consequences	(consequence	and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplified
consequences)	priority order.	clearly.	clearly.	•

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation

rai communication value rubric for eva	inating presentation tasks:
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	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction			
	and conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction	pattern (specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced
	is skillful and	clearly and	transitions) is	material within
	makes the	consistently	intermittently	the body, and
	content of the	observable	observable	transitions) is not
	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable, and	generally	commonplace	minimally
Language	compelling, and	support the	and partially	support the

	enhance the	effectiveness of	support the	effectiveness of
	effectiveness of	the	effectiveness of	the presentation.
	the	presentation.	the	Language in
	presentation.	Language in	presentation.	presentation is
	I anguage in	presentation is	I anguage in	not appropriate to
	presentation is	appropriate to	presentation is	audience
	presentation is	appropriate to	presentation is	audiciice.
	appropriate to	audience.	appropriate to	
	audience.		audience.	
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable.	of the
	speaker appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	annears	speaker appears
Delivery	confident	comfortable	tentative	uncomfortable
Denvery	A variety of			
	A vallety of			
	types of	C	Common and in a	
	supporting	Supporting	Supporting	T CC ·
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations from	quotations from	quotations from	statistics,
	relevant	relevant	relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	nartially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	astablishes the	astablishes the	presentation of	astablishes the
	presenter's	presenter's	presenter's	presenter's
G	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central		Central	
	message is	Central	message is	Central message
	compelling	message is	basically	can be deduced
Central	(precisely	clear and	understandable	but is not
Message	stated,	consistent with	but is not often	explicitly stated

appro repea memo strony suppo	opriately the s need, mate orable, and gly orted.)	upporting rep prial. no	epeated and is ot memorable.	in the presentation.
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Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

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Assoc.Prof. Nguyen Van Sinh

Course Name: Principles of Database Management

Course Code: IT079IU

1. General information					
Course designation	This course focuses on the design and implementation of database management systems				
Semester(s) in which the course is taught	4				
Person responsible for the course	Assoc. Prof. Dr. Nguyen Thi Thuy Loan				
Language	English				
Relation to curriculum	Compulsory (NE, CS,DS)				
Teaching methods	Lecture, lesson, project, seminar.				
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120				
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1				
Required and recommended prerequisites for joining the course	IT116IU (C Programming	g)			
Course objectives	This subject introduces the students to basic database design and implementation concepts. Database design techniques, including relational design and E-R analysis, are presented. Database queries using SQL are covered in lectures and supported by practical exercises.				
Course learning outcomes	 CLO 1. Produce an (Extended) Entity-Relationship (E-R) model from specifications. CLO 2. Apply data normalization principles to transforming an ER model into a database schema. CLO 3. Construct efficient SQL queries to retrieve and manipulate data as required. 				
	Competency level	Course learning outcome (CLO)			
	Knowledge	CLO1			
	Skill	CLO2, CLO3			
	Attitude	CLO3			
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)				

1. General information
	Торіс	Weight	Level			
	Introduction to Database Systems	3	Ι			
	Relational Model and Relational Algebra	6	T, U			
	Structured Query Language	6	T, U			
	(Extended) Entity Relationship Model	6	T, U			
	Relational Database Design	9	T, U			
	Normalization	6	T, U			
	Advanced SQL	6	T, U			
	Review	3	I, U			
Examination forms	Multiple-choice questions, short-answer questions					
Study and	Attendance: A minimum attendance of 80 percent is compulsory					
examination	for the class sessions. Students will be assessed on the basis of					
requirements	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. Abraham Silberschatz, Henry F. Korth,	S. Sudarsł	nan,			
	Database System Concept 7th, 2020					
	2. Jeffrey A. Hoffer, Ramesh Venkatarama	2. Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi,				
	Modern Database Management 13th, 20	Modern Database Management 13th, 2019				
	3. Ramez Elmasri, Shamkant Navathe, Fundamentals of					
	Database Systems 7th, 2016					

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:

	SLO					
CLO	1	2	3	4	5	6
1	XXX					
2		XXX			Х	
3		XX			XX	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to Database Systems	1	Quiz	Lecture	[1,3]
2	Relational Model and relational Algebra	2	Quiz, Midterm, Project	Lecture, Discussion, In- class, exercise	[1,3]
3	Structured Query Language	3	Quiz, Lab, Project, Midterm	Lecture, Discussion, In- class, exercise	[1,2,3]

4	(Extended) Entity Relationship Model	2	Quiz, Project, Midterm	Lecture, Discussion, In- class, exercise	[1,2,3]
5	Midterm				
6	Relational Database Design	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In- class, exercise	[1,2]
7	Normalization	2,3	Quiz, Project, Final	Lecture, Discussion, In- class, exercise	[2,3]
8	Advanced SQL	3	Quiz, Project, Final	Lecture, Discussion, In- class, exercise	[1,3]
9	Review	2,3	Quiz	Discussion, In- class, exercise	[1,2,3]
10	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3		
Labs (10%)		10%	20%		
Midterm examination (25%)	40%		20%		
Quiz (5%)	10%	20%			
Projects/Presentations/ Report (20%)	30%	20%	30%		
Final examination (40%)	20%	50%	30%		

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

1. 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. $\underline{\leftarrow}$

5. Rubrics (optional)

5.1. Grading checklist						
Grading checklist for Written Reports						
Student:	HW/A	Assignme	nt:			
Date:						
		ator:				
	Max.	Score	Comments			
Technical content (60%)						
Abstract clearly identifies purpose and summarizes	10					
principal content						
Introduction demonstrates thorough knowledge of	15					
relevant background and prior work						
Analysis and discussion demonstrate good subject	30					
mastery						

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

Hol	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
			Issue/	
			problem to be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	
	comprehensivel	stated,	ambiguities	Issue/
	y, delivering all	described, and	unexplored,	problem to be
	relevant	clarified so that	boundaries	considered
	information	understanding is	undetermined	critically is
	necessary for	not seriously	, and/ or	stated without
Explanation of	full	impeded by	backgrounds	clarification
issues	understanding.	omissions.	unknown.	or description.

is taken from source(s)
is taken from source(s)
source(s)
with some
with some
Information is Information is interpretation
taken from taken from / evaluation,
source(s) with source(s) with but not
enough enough enough to Information is
interpretation/ interpretation/ develop a taken from
evaluation to evaluation to coherent source(s)
develop a develop a analysis or without any
comprehensive coherent synthesis. interpretation
Evidence analysis or analysis or Viewpoints evaluation.
Selecting and synthesis. synthesis. of experts are Viewpoints of
<i>using information</i> Viewpoints of Viewpoints of taken as experts are
to investigate a experts are experts are mostly fact. taken as fact.
<i>point of view or</i> questioned subject to with little without
conclusion thoroughly questioning questioning question
Ouestions
some
assumptions
Identifies Shows an
Thoroughly several emerging
(systematically relevant awareness of
and contexts present
methodically) when assumptions
analyzes own
analyzes own presenting a (sometimes
and others position. May labels
assumptions and indentifies own of assumptions as
evaluates the assumptions and others' Begins to
relevance of several relevant assumptions identify some
Influence of contexts when contexts when than one's contexts when
contexts when contexts when that one's contexts when
assumptions position position position
Specific position. Versa). position.
(nerspective
thesis/
hypothesis) is (nerspective
imaginative thesis/hynothesis
taking into) takes into
account the account the
complexities of complexities of Specific
an issue Limits an issue Others' position Specific
of position points of view (perspective position
(perspective are thesis/ (perspective
Student's thesis/ acknowledged hypothesis) thesis/
position hypothesis) are within position acknowledge hypothesis) is
(perspective, acknowledged, (perspective, s different stated, but is
thesis/hypothesis Others' points of thesis/ sides of an simplistic and
) view are hypothesis). issue. obvious.

	synthesized within position (perspective, thesis/ hypothesis).			
Conclusions and related outcomes (implications	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequence s and implications)	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are
and consequences)	discussed in priority order	identified	are identified	oversimplified

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction			
	and conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction	pattern (specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced
	is skillful and	clearly and	transitions) is	material within
	makes the	consistently	intermittently	the body, and
content of the		observable	observable	transitions) is not
	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable, and	generally	commonplace	minimally
	compelling, and	support the	and partially	support the
	enhance the	effectiveness of	support the	effectiveness of
Language	effectiveness of	the	effectiveness of	the presentation.

	41e e		41e a	T an anno an in
	the	presentation.	the	Language in
	presentation.	Language in	presentation.	presentation is
	Language in	presentation is	Language in	not appropriate to
	presentation is	appropriate to	presentation is	audience.
	appropriate to	audience.	appropriate to	
	audience.		audience.	
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable.	of the
	speaker appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Delivery	confident	comfortable	tentative	uncomfortable
Denvery	Δ variety of	connormore.	tentative.	unconnortaole.
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(avalanations	(ovplanations	(ovplonations	illisuillicient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations from	quotations from	quotations from	statistics,
	relevant	relevant	relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central		Central	
	message is	Central	message is	Central message
	compelling	message is	basically	can be deduced
	(precisely	clear and	understandable	but is not
	stated,	consistent with	but is not often	explicitly stated
Central	appropriately	the supporting	repeated and is	in the
Message	repeated,	material.	not memorable.	presentation.

memorable, and		
strongly		
supported.)		

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

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Assoc.Prof. Nguyen Van Sinh

Course Name: Philosophy Marx - Lenin

1. 7	Fhông tin chung			
	Tên môn học (tiếng	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		
	Số tiết lý thuyết:	30 (trên lớp)		
	Số tiết thực hành:	15 (trên lớp)		
	Số tiết tự học:	90 (về nhà)		
	Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM		

Course Code: PE015IU

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)
5.1. Kiếi	n thức		nýc		
		LO. 1.1 - Khái lược được triết học, một số khái niệm cơ bản trong triết học			
	TRIẾT HỌC VÀ VAI TRÒ CỦA	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			
LO.1	TRIET HỌC TRONG ĐỜI SỐNG XÃ HỘI	LO. 1.3 - Nắm được chủ nghĩa duy vật biện chứng - hình thức phát triển cao nhất của chủ nghĩa duy vật biện chứng	2.1	1.1.3	13
		LO. 1.4 - Nắm rõ được sự ra đời, đối tượng, chức năng và vai trò của triết học Mác - Lênin			
LO.2	CHỦ NGHĨA DUY VẬT BIỆN CHỨNG	LO.2.1- Hiếu rõ vật chất theo quan điểm của chủ nghĩa duy vật biện chứng	2.1	1.1.3	T4

	2.1	
LO.2.2 - Hiểu rõ ý thức theo quan điểm của chủ nghĩa duy vật biện chứng	2.1	
LO23-Giải quyết được	2.1	
mối quan hệ giữa vật chất và ý thức theo quan điểm của chủ nghĩa duy vật biện		
chứng LO.2.4 - Hiểu được phép biện chứng và phép biện chứng duy vật		
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	
	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	
	2.1	
LO.2.7 - Hiểu rõ được các quy luật cơ bản của cơ bản của phép biện chứng duy vật và rút ra ý nghía phương pháp luận từng quy luật	2.1 2.2	
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 liệ biện chứng giữa CSHT và KTTT; sự phát triển tự nhiên của các hình thái KT-XH 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 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 	2.1 2.2	1.1.3	T4
5.2. K	v năng				
LO.4	THẾ HIỆN KHẢ NĂNG KHẢI 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 bội, 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

5.3. TH	5.3. Thái độ					
LO.5	THẾ 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 vối tập thế, cộng đồng	2.1 2.2	3.1	U3	

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

TT	Nội	LO	Hoạt động dạy và học	Đánh giá
(Tiêt)	dung giảng dạy			
1 (1 tiết)	Giới thiệu về môn học	LO.1, LO.4;	 Dạy: Giới thiệu đề cương môn học Giới thiệu nội dung đề tài thuyết trình nhóm GHW) Học ở lớp: Chia nhóm (5 sv/nhóm) Giới thiệu nhóm học tập Học ngoài lớp: Chọn đề tài thuyết trình của nhóm (GHW) Đọc trước tài liệu chương 1. 	
2 (15 tiết)	Chương 1 TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI	LO.1; LO.4 LO.5	 Dạy: 1. TRIẾT HỌC VÀ VÂN ĐỀ CƠ BẢN CỦA TRIẾT HỌC 1. Khái lược về triết học 2. Vấn đề cơ bản của triết học 3. Biện chứng và siêu hình II. TRIẾT HỌC MÁC - LÊNIN VÀ VAI TRÒ CÙA TRIẾT HỌC MÁC - LÊNIN VÀ VAI TRÒ CÙA TRIẾT HỌC MÁC - LÊNIN TRONG ĐỜI SỐNG XÃ HỘI 1. Sự ra đời và phát triển của triết học Mác - Lênin 2. Đối tượng và chức năng của triết học Mác - Lênin 3. Vai trò cùa triết học Mác - Lênin trong đời sống xã hội và trong sự nghiệp đổi mới ở Việt Nam hiện nay Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Phác thảo nội dung thuyết trình nhóm GHW Đọc trước tài liêu chương 2. 	Thi giữa kỳ (Quiz)

3 (15 tiết)	Chương 2 CHỦ NGHĨA DUY VẬT BIỆN CHỨNG	LO.2 LO.4 LO.5	 Dạy: I. VẬT CHẤT VÀ Ý THỨC 1. Vật chất và các hình thức tồn tại của vật chất 2. Nguồn gốc, bản chất và kết cấu của ý thức 3. Mối quan hệ giũa vật chất và ý thức II. PHÉP BIỆN CHÚNG DUY VẬT 1. Hai loại hình biện chứng và phép biện chứng duy vật Nội dung của phép biện chứng duy vật III. LÝ LUẬN NHẬN THỨC 1. Các nguyên tắc của lý luận nhận thức duy vật biện chứng 2. Nguồn gốc, bản chất của nhận thức 3. Thực tiễn và vai trò của thực tiễn đối với nhận thức 4. Các giai đoạn cơ bản của quá trình nhận thức Chân lý Học ở Lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Đọc trước tài liệu chương 3 	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)
4 (14 tiết)	Chương 3 CHỦ NGHĨA DUY VẬT LỊCH SỬ	L0.3 L0.4 L0.5	 Dạy: I. HỌC THUYẾT HÌNH THÁI KINH TẾ - XÃ HỘI 1. Sản xuất vật chất là cơ sở của sự tồn tại và phát triển xã hội 2. Biện chứng giữa lực lượng sản xuất và quan hệ sản xuất 3. Biện chứng giữa cơ sở hạ tầng và kiến trúc thượng tầng của xã hội 4. Sự phát triển các hình thái kinh tế - xã hội là một quá trình lịch sử - tự nhiên II. GIAI CÂP VÀ DÂN TỘC 160 1. Vấn đề giai cấp và đấu tranh giai cấp 2. Dân tộc 3. Mối quan hệ giai cấp - dân tộc - nhân loại III. NHÀ NƯỚC VÀ CÁCH MẠNG XÃ HỘI 1. Nhà nước 2. Cách mạng xã hội IV. Ý THỨC XÃ HỘI 1. Khái niệm tồn tại xã hội và các yếu tố cơ bản của tồn tại xã hội 2. Ý thức xã hội và kết cấu của ý thức xã hội V. TRIẾT HỌC VỀ CON NGƯỜI 1. Khái niệm con người và bàn chất con người 2. Hiện tượng tha hóa con người và vấn đề giải 	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

 3. Quan hệ cá nhân và xã hội; vai trò của quần chúng nhân dân và lãnh tụ trong lịch sử Vấn đề con người trong sự nghiệp cách mạng
ở Việt Nam
Học ở lớp: Tháo luận và phát biểu trên lớp
Học ngoài lớp: Hoàn thiện bài thuyết trình

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.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 đổi. 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;
			Tổng cộng	100%		

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

8. Tiêu chí đánh giá chuẩn đầu ra môn học

9. Một số lưu ý khác:

Khi có các thắc mắc liên quan môn học, sinh viên có thế 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 đãng 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.

Course Name: Marxist - Leninist Political Economy

Course Code: PE016IU

1. Thông tin chung

Tên môn học (tiếng	Kinh tê chính trị Mác-Lênin
Việt):	
Tên môn học (tiếng	Marxist - Leninist Political Economy
Anh);	
Mã số môn học:	PE016IU
Thuộc khôi kiên thức:	Cơ sở
Số tín chì:	02
Sô tiết lý thuyết:	20 (trên lớp)
số tiết thực	10 (trên lớp)
hành:	
Số tiết tự học:	60 (về nhà)
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. 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 chuyến lý 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 lợi ích kinh tế trong phát triển kinh tể 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.

- 2.3. Ba là, góp phần xây dựng lập trường, ý thức hệ tư tưởng Mác Lê nin đối với sinh viên.
- 3. Mô tả môn học (Course Outlines)

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 thế các vấn đề như: Hàng hóa, thị trường và vai trò của các chủ thế trong nền kinh tế thị trường; Sản xuất giá trị thặng dư trong nền kinh tế thị trường; 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 lợi ích kinh tế ở Việt Nam; Công nghiệp hóa, hiện đại hóa và hội nhập kinh tế quốc tế ở 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 sừ các học thuyết kinh tế, Bản tiếng Việt, Nxb Thống kê.

+ Viện Kinh tế chính trị học, 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. Ăng gen: Toàn tập, tập 20, tập 23, tập 25, Nxb Chính trị quốc gia, 1994.

+ V.LLê nin toàn cập, tập 3, tập 27, NXB Tiến bộ Maxcova, 1976.

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

+ Đảng Cộng sản Việt Nam (2016), Vãn 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 van 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 thế chế kinh tể thị trường định hướng xã hội chủ nghĩa"

+ Chỉ thị số 16/CT-TTg (2017) "về việc tăng cường năng lực tiếp cận 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): Cách mạng công nghiệp lần thứ tư, Nxb Chính trị quốc gia - Sự thật, 2018.

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
5.1. Kiế	n thức				
LO.1	ĐỐI TƯỢNG, PHƯỜNG PHẤP NGHIÊN CỨU VÀ CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC - LÊNIN	 LO. 1.1 -Nắm được sự hình thành và phát triển của Kinh tế chính trị <u>Mác – Lênin</u> LO. 1.2 - Xác dinh được đối tượng nghiên cứu của kinh tế chính trị Mác - Lênin. LO. 1.3 - Hiểu rõ được phương pháp nghiên cứu cùa kinh tể chính trị Mác- Lênin LO. 1.4 - Hiểu rõ các chức năng của môn học kinh tế chính trị Mác - Lênin. 	2.1		13

		<u> </u>	1		
		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			
	HÀNG HÓA, THỊ TRƯỜNG VÀ VAI				
		LO.2.4 - Hiêu rõ mặt			
		chất và lượng của giả trị			
		hàng hòa và các nhân tố			
LO.2	TRÒ CỦA CÁC	anh hương den lượng	2.1		Т4
	CHỦ THỂ THAM	gia trị hang hoa			
	GIA THỊ TRƯỜNG.	?			
		LO.2.5 - Hiêu rõ được			
		nguôn gốc, bản chất và			
		chức năng của tiên tệ.	-		
		LO.2.6 - Hiêu rõ vê thị			
		trường, vai trò của thị			
		trường, cơ chê thị			
		trường và nên kinh tê thị			
		trường.			
		LO.2.7 - Hiểu rõ được			
		một số quy luật kinh tế			
		chủ yêu của kinh tế thị			
		trường.	1		
		LO.2.8 - Hiệu rõ vai trò			
		cua cac chu thể tham gia			
		the two would be	1	1	

		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.	2.12.12.12.3	T4
		LO.3.2 - Hiểu rõ được hàng hóa sức lao động là gì, tại sao nghiên cửu hàng hóa sức lao động giải quyết mâu thuẫn	2.3 2.1	
LO.3	GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.3.3 - Hiểu rõ được giá trị thặng dư là gì. Xác định được có mấy phương pháp sản xuẩt giá trị thặng dư.	2.1 2.1 2.3	
		 LO.3.4 - Hiểu rõ được bản chất của tích lũy tư bản, nhưng nhân tố làm tăng quy mô tích lũy tư bản và hệ quả của tích lũy tư bản. LO.3.5 - Hiểu rõ được các khái niệm: chi phí sản xuất, lợi nhuận, tỷ suất lợi nhuận, lợi nhuận bình quân, lợi 		
		LO.3.6 - Hiểu rõ được lợi tức là gì.		

		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.		
		LO.4.1 - Hiểu rõ được quan hệ giữa cạnh tranh và độc quyền trong nền kinh tế thị trường.	2.1	
			2.1	
		LO.4.2 - Hiểu rõ được nguyên nhân hình thành độc quyền trong nền kinh tế thị trường.	2.1 2.1	
LO.4	CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG	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		
		LO.4.4 - Hiểu rõ được nguyên nhân hình thành và phát triển của chủ nghĩa tư bản độc quyền nhà nước.		

		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.5.1 - Hiểu rõ dược khái niệm kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam	2.12.1	
			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.5.2 - 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 LO.5.3 - Nắm được những đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam.		T4
		LO.5.4 - Hiểu rõ thế 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 thế chế kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam	2.1	
		LO.5.6 - Hiểu rõ được khái niệm lợi ích kinh tế và quan hệ lợi ích kinh tế	2.2	

			1		
		LO.5.7 -Hiểu rõ được vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích	2.1		
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 gi, khái quát được các cuộc cách mạng đã diễn ra trong lịch sử.	2.1	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 hóa là gì và các mô hình công nghiệp hóa tiêu biểu trên thế giới.	2.1 2.1 2.1 2.3 2.1		
		LO.6.4 - Hiểu rõ tính tất yếu khách quan của công nghiệp hóa, hiện đại hóa ở Việt Nam.			
		LO.6.5 - Nắm được những nội dung của công nghiệp hóa, hiện đại hóa ở Việt Nam.		T4	
		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.			
		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.			

		LO.6.8 - Nắm được những nội dung và tác động tích cực và tiêu cực của hội nhập kinh tể quốc tế.	2.3	
		LO.6.9 - Nắm được phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế trong phát triển của Việt Nam	2.3	
5.2. Kj	ỹ năng			
L0.7	THẾ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	 LO.7.1. 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.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 LO.7.3. 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
5.3. TI	hái độ			1
		LO.8.1. Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng, nhân văn của CN Mác - Lênin	2.1	
LO.8	THỂ HIỆN Y THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	LO.8.2. Có ý thức, trách nhiệm cá nhân đối vối tập thế, cộng đồng	2.2 2.3	U3
		LO.8.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong đời 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 (1 tiết)	Giới thiệu về môn học	LO.1, LO.7;	 Dạy: Tự giới thiệu về giảng viên Giới thiệu đề cương và tài liệu môn học Hướng dẫn cách thức dạy và học và cách đánh giá. Giới thiệu nội dung đề tài thuyết trình nhóm GHW) Học ở lớp: Chia nhóm (5 sv/nhóm) Giới thiệu nhóm học tập Học ngoài lớp: Chọn đề tài thuyết trình của nhóm (GHW) Dọc trước tài liệu chương 1. 	
2 (2 tiết)	Chương I ĐỐI TƯỢNG, PHƯỜNG PHÁP NGHIÊN CỨU VÀ CHỨC NĂNG CÙA KINH TẾ CHÍNH TRỊ MÁC - LÊNIN	LO.1; LO.7 LO.8	Dạy:I. SỰ HÌNH THÀNH VÀ PHÁT TRIỀN CỦAKTCT MÁC - LENIN1.Giai đoạn từ cổ đại dền thế kỷ 182.Giai đoạn từ sau thế kỷ 18 đến nayII. ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊNCỨU CỦA KINH TẾ CHÍNH TRỊ MÁC -LÊN1N.1.Đối tượng nghiên cứu2.Phương pháp nghiên cứu3.Mục đích nghiên cứuIII. CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊMÁC - LÊNIN.1.Chức năng nhận thức2.Chức năng tư tưởng4.Chức năng phương pháp luận	Thi giữa kỳ (Quiz)

3 (6 tiết)	Chương 2 HÀNG HÓA, THỊ TRƯỜNG VA VAI TRÒ CỦA CÁC CHỦ THẾ THAM GIA THỊ TRƯỜNG.	LO.2 LO.7 LO.8	 Dạy: I. LÝ LUẬN CỦA CÁC MÁC VỀ SẢN XUẤT HÀNG HÓA VÀ HÀNG HÓA. I.Sản xuất hàng hỏa -Khái niệm sản xuất hàng hóa - Điều kiện ra đời cùa sàn xuất hàng hóa. 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 - Tính hai mặt của lao động sản xuất hàng hóa. 3.Tiền - Nguồn gốc và bản chất của tiền - Chức năng của tiền 4.Dịch vụ và một số hàng hóa đặc biệt. II. THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỀ THAM GIA THỊ TRƯỜNG. 1. Thị trường - Khái niệm về thị trường. - Cơ chế thị trường. - Cơ chế thị trường. 2. Vai trò của các chủ thể tham gia thị trường. - Người tiêu dùng. - Các chủ thể trung gian trong thị trường. - Nhà nước. Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Đọc trước tài liệu chương 3. 	Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)
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4 (6 tiết)	Chương 3 GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.3 LO.7 LO.8	 Dạy: I.LÝ LUÂN CỦA CÁC MÁC VÈ GIÁ TRỊ THẶNG DƯ 1.Nguồn gốc của giá trị thặng dư 2.Bản chất của giá trị thặng dư 3.Các phương pháp sản xuất giá trị thặng dư trong nền kinh tế thị trường tư bản chủ nghĩa. II.TÍCH LŨY TƯ BẢN -Bản chất của tích lũy -Những nhân tố góp phần làm tăng quy mô tích lũy -Một số hệ quả của tích lũy tư bản III.CÁC HÌNH THỨC BIỂU HIỆN GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH TẾ THỊ TRƯỜNG 1.Lợi nhuận 2.Lợi tức 3.Địa tô tư bản chủ nghĩa Học ngoài lớp: Hoàn thiện bài thuyết trình Đọc trước tài liệu chương 4 	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
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5 (5 tiết)	Chương 4 CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.4 LO.7 LO.8	 I. QUAN THE OTOA CANT TRANH VÀ ĐỌC QUYÊN TRONG NN KINH TẾ THỊ TRƯỜNG. I. ĐỘC QUYÈN VÀ ĐỘC QUYÈN NHÀ NƯỚC TRONG NÊN KỈNH TẾ THỊ TRƯỜNG. I. Lý luận của V.I. Lênin về độc quyền trong nên kinh tế thị trường. Nguyên nhân hình thành và tác động của độc quyền. Những đặc điểm kinh tế cơ bản của độc quyền trong chủ nghĩa tư bản Lý luận của V.I. 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. Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Đọc trước tài 	trinn (GHW) Thi cuối kỳ (FEX)	
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6 (5 tiết)	Chương 5 KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ổ VIỆT NAM	LO.5 LO.7 LO.8	 Dạy: I. KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM 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. 	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
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6 (5 tiết)	Chương 5 KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM	LO.5 LO.7 LO.8	 II. HOÀN THIỆN THẾ CHẾ KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM. 1.Sự cần thiết phải hoàn thiện thế chế kinh tế 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. III. CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM Lợi ích kinh tế và quan hệ lợi ích kinh tế. 1.Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Hoàn thiện bài thuyết trình 	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
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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	15%	Thuyết trình và bản báo cáo nhóm	LO.4 LO 5 LO6 LO.7 LO 8
2	Quiz	Bài thi giữa kỳ	Thi theo đề thi chung	20%	Tự luận đề mở	LO.2 LO.3
3	DIC	Thảo luận, chuyên cần tại lớp (Discussion in Class)	Điểm thào luận được tính theo phương pháp tương đối. sv có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa,	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại	LO.7 LO.8

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 LO.5 LO.6 LO.7 LO.8
			Tổng cộng	100%		

8. Tiêu chí đánh giá chuẩn đầu ra môn học

ТТ	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết được vị trí của Kinh tế chính trị Mác - Lênin trong hệ thống lịch sử tư tưởng kinh tế và nắm được đối tượng, phương pháp và chức nặng của kinh tế chính	Chương 1	Thỉ giữa 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 tính 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 các chủ thế 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 là gì? 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 tăng quy	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
LO.4 LO.7	Hiểu rõ và nắm được những nội dung: quan hệ giữa 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 bàn 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 thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV
LO.5 LO.7	Hiểu rõ và nắm được những nội dung: kinh tế thị trường định hưởng xã hội chủ nghĩa ở Việt Nam, những đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa. Thế chế kinh tế thị trường định hướng xã hội chủ nghĩa và sự cần thiết phải hoàn thiện thế 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 thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV

LO.6 LO.7	Hiểu rõ và nắm được 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	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 GV
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9. Một số lưu ý khác

- Khi có các thắc mắc liên quan môn học, sinh viên có thế liên lạc với giảng viên qua email: 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 nộp cho GV buổi ỉ.

- Tuần 4 (buổi thú' 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.

Course Name: Computer Architecture

Course Code: IT089IU

1. General information

Course designation	This course introduces the principles of computer organization and the basic computer architecture.
Semester(s) in which the course is taught	4
Person responsible for the course	Dr. Le Hai Duong
Language	English
Relation to curriculum	Compulsory (CS, NE, CE)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	 (Estimated) Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120 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.
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Digital Logic Design
Course objectives	This course provides students the principles of computer architecture and organization. It covers the subjects on assembly language and machine code, computer arithmetic and ALU design, computer performance, datapath and control, pipelining, memory hierarchy, I/O devices, multi-processor architectures, and mobile and multi-core processors.
Course learning outcomes	CLO 1. Understand the principles of computer architecture and the interfaces between its hardware and software components; CLO 2. Understand computer arithmetic (both integer and floating point), datapath, control , pipelining, pipeline hazards and their remedies, computer buses and I/O peripherals, and multiprocessor architecture;

	CLO 3. Create assembly programs and their machine code equivalent;CLO 4. Analyze the performance of computer;CLO 5. Analyze computer memory and its organization, especially the							
	interaction between cache and main memory.							
		Competency level	Course learning outco	me (CLO))			
		Knowledge		_				
		Skill CLO3, CLO4, CLO5						
		Attitude						
Content	The del the con Weight Teachi	scription of the content atent and the level. t: lecture session (3 h ng levels: I (Introduc	ents should clearly indicat ours) e); T (Teach); U (Utilize)	te the weig	hting of			
	Торіс			Weight	Level			
	History of computers, relations of software and hardware components;			1	Ι			
	Assembly language instructions			5	T, U			
	Comp design	outer arithmetic princ	iples and hardware	1	Т			
	Comp	outer performance	1	T,U				
	Datap	ath and its control	2	Т				
	Microprocessor pipelining				T, U			
	Memo	ory hierarchy	1	Т				
	I/O de	evices and buses		1	Т			
	Multi	processor		1	Т			
Examination forms	Multip	le-choice questions, s	short-answer questions					
Study and examination requirements	Attend the class particip Assign points	ance: A minimum att ss sessions. Students pation. Questions and ments/Examination: overall to pass this co	tendance of 80 percent is will be assessed on the bal comments are strongly e Students must have more purse.	compulsor asis of their encouraged than 50/10	y for r class l. 00			
Reading list	1. E	David A. Patterson an Drganization and Des	d John L. Hennessy, Con ign 5th, 2013	nputer				

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-5) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CL	1	2	3	4	5	6
0						
1	Х					
2	Х					
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3		Х		Х		
4	Х					
5	Х					

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	History of computers, relations of software and hardware components;	1	Quiz, exam	Lecture	[1]
2	Assembly language instructions	3	Quiz, exam	Lecture, lab, exercises	[1]
3	Computer arithmetic principles and hardware design	2	Quiz, exam	Lecture, exercises	[1]
4	Midterm				
5	Computer performance	4	Quiz, exam	Lecture, exercises	[1]
6	Datapath and its control	1, 2	Quiz, exam	Lecture, exercises	[1]
7	Microprocessor pipelining		Quiz, exam	Lecture, exercises	[1]
8	Memory hierarchy	5	Quiz, exam	Lecture, exercises	[1]
9	I/O devices and buses	2	Quiz, exam	Lecture, exercises	[1]
10	Multiprocessor	2	Quiz, exam	Lecture, exercises	[1]
11	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Midterm examination (30%)	70%	70%	25%		
Final examination (40%)			50%	70%	70%
Exercises/ Quiz (30%)	30%	30%	25%	30%	30%

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

1. 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. $\underline{\leftarrow}$

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports				
Student:	HW/A	Assignme	ent:	
Date:			•	
	Evalu	ator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes principal	10			
content				
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			
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

Н	lolistic 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
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	he considered	Issue/ problem to	leaves some	
	critically is stated	be considered	terms	
	clearly and	critically is	undefined	
	described	stated described	ambiguities	Issue/ problem
	acomprehensively	and algorified so	unexplored	to be
	dolivoring oll	that	hour domica	io be
	nelevent	understanding is	undatarminad	
			undetermined,	
Evaluation of	information	not seriously	and/ or	stated without
Explanation of	necessary for full	impeded by	backgrounds	clarification or
issues	understanding.	omissions.	unknown.	description.
			Information is	
			taken from	
	.		source(s) with	
	Information is	.	some	
	taken from	Information is	interpretation/	
	source(s) with	taken from	evaluation, but	
	enough	source(s) with	not enough to	Information is
	interpretation/	enough	develop a	taken from
	evaluation to	interpretation/	coherent	source(s)
	develop a	evaluation to	analysis or	without any
	comprehensive	develop a	synthesis.	interpretation/
Evidence	analysis or	coherent analysis	Viewpoints of	evaluation.
Selecting and	synthesis.	or synthesis.	experts are	Viewpoints of
using information	Viewpoints of	Viewpoints of	taken as	experts are
to investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
	Thoroughly		Questions	Shows an
	(systematically		some	emerging
	and methodically)		assumptions.	awareness of
	analyzes own and		Identifies	present
	others'		several	assumptions
	assumptions and	Identifies own	relevant	(sometimes
	carefully	and others'	contexts when	labels
	evaluates the	assumptions and	presenting a	assertions as
	relevance of	several relevant	position. Mav	assumptions).
Influence of	contexts when	contexts when	be more aware	Begins to
context and	presenting a	presenting a	of others'	identify some
assumptions	position.	position.	assumptions	contexts when

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

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks:

Capstone	Mile	stone	Benchmark
4	3	2	1

				[]
	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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not
	content of the	observable	observable	transitions) is not
.	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.
	Language	_	Language	
	choices are	Language	choices are	
	imaginative,	choices are	mundane and	Language choices
	memorable, and	thoughtful and	commonplace	are unclear and
	compelling, and	generally	and partially	minimally support
	enhance the	support the	support the	the effectiveness
	effectiveness of	effectiveness of	effectiveness of	of the
	the presentation.	the presentation.	the presentation.	presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is not
	appropriate to	appropriate to	appropriate to	appropriate to
Language	audience.	audience.	audience.	audience.
	Delivery		Delivery	Delivery
	techniques	Delivery	techniques	techniques
	(posture, gesture,	techniques	(posture, gesture,	(posture, gesture,
	eye contact, and	(posture, gesture,	eye contact, and	eye contact, and
	vocal	eye contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the
	speaker appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of	Supporting		
	supporting	materials		Insufficient
	materials	(explanations,	Supporting	supporting
	(explanations,	examples,	materials	materials
	examples,	illustrations,	(explanations,	(explanations,
	illustrations,	statistics,	examples,	examples,
	statistics,	analogies,	illustrations,	illustrations,
	analogies,	quotations from	statistics,	statistics,
	quotations from	relevant	analogies,	analogies,
	relevant	authorities)	quotations from	quotations from
	authorities) make	make	relevant	relevant
	appropriate	appropriate	authorities) make	authorities) make
	reference to	reference to	appropriate	reference to
	information or	information or	reference to	information or
	analysis that	analysis that	information or	analysis that
	significantly	generally	analysis that	minimally
	supports the	supports the	partially supports	supports the
	presentation or	presentation or	the presentation	presentation or
	establishes the	establishes the	or establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
~	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central message			
	is compelling		Control more con	
	(precisely stated,	$C \rightarrow 1$	Central message	$C \rightarrow 1$
	appropriately	Central message	is basically	Central message
	repeated,	is clear and	understandable	can be deduced
Control	strongly	the supporting	repeated and is	out is not
Uentral Massage	surongly	metarial	repeated and 1s	the procentation
wiessage	supported.)	materiai.	not memorable.	me presentation.

Source: Association of American Colleges and Universities Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Assoc.Prof. Nguyen Van Sinh

Course Name: Object-Oriented Analysis and Design

Course Code: IT090IU

1. General information

1. Course designation	This course helps students and the knowledge and ski system.	learn about system life cycle developmen lls required to develop object-oriented	nt	
Semester(s) in which the course is taught	4			
Person responsible for the course	MSc. Dao Tran Hoang Ch	au		
Language	English			
Relation to curriculum	Compulsory (CS)			
Teaching methods	Lecture, lesson, project, se	minar.		
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 195 hours. Contact hours: Lecture 45 hours, Lab 30 hours: Private hours: 120 hours. 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.			
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1			
Required and recommended prerequisites for joining the course	Object-Oriented Programn	ning		
Course objectives	The course tries to solve the approaches other than objective oriented design? • What is between a good and a bad characteristics of a good designed by the solution of the solution of the solution of the so	ne following questions• What are design ect-oriented design? What is object- a good design? How do you differentiate design? What are the important esign?	e	
Course learning outcomes	CLO 1. Identify client needs based on a written or verbal specification; CLO 2. Know how analyze and design a system with object-oriented concepts and design patterns; CLO 3. Know how to work in team effectively;			
	Competency level	Course learning outcome (CLO)		
	Knowledge	1, 2		
	Skill	1, 3		
	Attitude	3		

Content	The description of the contents should clearly indicate the weighting					
	of the content and the level.	of the content and the level.				
	Weight: lecture session (45 hours)					
	Feaching levels: I (Introduce); T (Teach); U (Utilize)					
	Торіс	Weight	Level			
	Software development life cycle;	2	Т			
	Requirements gathering techniques;	1	Т			
	Analyze client's requirements;	4	Т			
	Design and implementation the system;	6	T, U			
	Design patterns;	2	T, U			
Examination forms	Multiple-choice questions, short-answer questions					
Study and examination	Attendance: A minimum attendance of 80 percent is compulsory for					
requirements	the class sessions. Students will be assessed or	n the basis	of their			
-	class participation. Questions and comments a	re strongly	y			
	encouraged.					
	Assignments/Examination: Students must have more than 50/100					
	points overall to pass this course.					
Reading list	1. Craig Larman, Applying UML and Patte	rns - An i	ntroduct	ion		
	to Object-Oriented Analysis And Design 3rd, 2004					

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1	X					
2		х				
3					Х	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning	Resources
				activities	
1	Software development life cycle;	1	Midterm exam	Lecture, In-class activities	
2	Requirements gathering techniques;	1	Midterm exam	Lecture, In-class activities	
3	Analyze client's requirements;	1,3	Midterm exam, Assignment, Lab quiz	Lecture, In-class activities, Quiz	
4	Midterm				

5	Design and implementation the system;	2, 3	Final exam, Assignment, Lab quiz	Lecture, In-class activities, Quiz
6	Design patterns;	2	Final exam	Lecture, In-class activities
7	Final exam			

4. Assessment plan

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

Assessment Type	CLO1	CLO2	CLO3
Midterm examination (25%)	40%	25%	
Projects/Presentations/ Report (25%)	60%	30%	70%
Final examination (40%)		30%	10%
Exercises/ Quiz (10%)		15%	20%

1. 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.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports					
Student:	HW/Assignment:				
Date:					
	Evalu	ator:			
	Max.	Score	Comments		
Technical content (60%)					
Abstract clearly identifies purpose and summarizes principal	10				
content					
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				
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				

FOTAL SCORE	100		
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5.2. Holistic rubric

H	lolistic 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
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem to	leaves some	
	critically is stated	be considered	terms	
	clearly and	critically is	undefined,	
	described	stated, described,	ambiguities	Issue/ problem
	comprehensively,	and clarified so	unexplored,	to be
	delivering all	that	boundaries	considered
	relevant	understanding is	undetermined,	critically is
	information	not seriously	and/ or	stated without
Explanation of	necessary for full	impeded by	backgrounds	clarification or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information is	Information is
	taken from	taken from	taken from	taken from
Evidence	source(s) with	source(s) with	source(s) with	source(s)
Selecting and	enough	enough	some	without any
using information	interpretation/	interpretation/	interpretation/	interpretation/
to investigate a	evaluation to	evaluation to	evaluation, but	evaluation.
point of view or	develop a	develop a	not enough to	Viewpoints of
conclusion	comprehensive	coherent analysis	develop a	experts are

	analysis or	or synthesis.	coherent	taken as fact.
	synthesis.	Viewpoints of	analysis or	without
	Viewpoints of	experts are	synthesis.	question.
	experts are	subject to	Viewpoints of	
	questioned	questioning.	experts are	
	thoroughly.	questioning.	taken as	
	unoro aginy i		mostly fact	
			with little	
			questioning	
			Questions	
			some	Shows an
			assumptions	emerging
	Thoroughly		Identifies	owereness of
	(austomatically		ruentines	awareness of
	(Systematically		several	present
	and methodically)		ielevalit	assumptions
	analyzes own and		contexts when	
	others	T.1	presenting a	labels
	assumptions and	Identifies own	position. May	assertions as
	carefully	and others	be more aware	assumptions).
	evaluates the	assumptions and	of others'	Begins to
T (R)	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's own	contexts when
context and	presenting a	presenting a	(or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific position			
	(perspective,			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	account the			
	complexities of			
	an issue. Limits	Specific position		
	of position	(perspective,		
	(perspective,	thesis/hypothesis)		
	thesis/	takes into account		
	hypothesis) are	the complexities		
	acknowledged.	of an issue.	Specific	Specific
	Others' points of	Others' points of	position	position
	view are	view are	(perspective,	(perspective,
	synthesized	acknowledged	thesis/	thesis/
Student's	within position	within position	hypothesis)	hypothesis) is
position	(perspective,	(perspective,	acknowledges	stated, but is
(perspective,	thesis/	thesis/	different sides	simplistic and
thesis/hypothesis)	hypothesis).	hypothesis).	of an issue.	obvious.

			Conclusion is	
			logically tied	
	Conclusions and		to information	Conclusion is
	related outcomes	Conclusion is	(because	inconsistently
	(consequences	logically tied to a	information is	tied to some of
	and implications)	range of	chosen to fit	the
	are logical and	information,	the desired	information
	reflect student's	including	conclusion);	discussed;
	informed	opposing	some related	related
	evaluation and	viewpoints;	outcomes	outcomes
	ability to place	related outcomes	(consequences	(consequences
Conclusions and	evidence and	(consequences	and	and
related outcomes	perspectives	and implications)	implications)	implications)
(implications and	discussed in	are identified	are identified	are
consequences)	priority order.	clearly.	clearly.	oversimplified.

Oral communic	ation value rubric f	for evaluating presentation tasks:	
	Capstone	Milestone	

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and			
	conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction and	pattern (specific	
	the body, and	conclusion,	introduction and	Organizational
	transitions) is	sequenced	conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and is	transitions) is	the body, and	sequenced
	skillful and	clearly and	transitions) is	material within the
	makes the	consistently	intermittently	body, and
	content of the	observable	observable	transitions) is not
	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.
		Language		
	Language	choices are	Language	Language choices
	choices are	thoughtful and	choices are	are unclear and
	imaginative,	generally	mundane and	minimally support
	memorable, and	support the	commonplace	the effectiveness
	compelling, and	effectiveness of	and partially	of the
	enhance the	the presentation.	support the	presentation.
	effectiveness of	Language in	effectiveness of	Language in
	the presentation.	presentation is	the presentation.	presentation is not
	Language in	appropriate to	Language in	appropriate to
Language	presentation is	audience.	presentation is	audience.

_

	appropriate to		appropriate to	
	audience.		audience.	
	Delivery		Delivery	Delivery
	techniques	Delivery	techniques	techniques
	(nosture gesture	techniques	(nosture gesture	(posture gesture
	eve contact and	(nosture gesture	eve contact and	eve contact and
	vocal	eve contact and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable.	of the
	speaker appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Deliverv	confident.	comfortable.	tentative.	uncomfortable.
v	A variety of			
	types of	Supporting		
	supporting	materials		Insufficient
	materials	(explanations,	Supporting	supporting
	(explanations,	examples,	materials	materials
	examples,	illustrations,	(explanations,	(explanations,
	illustrations,	statistics,	examples,	examples,
	statistics,	analogies,	illustrations,	illustrations,
	analogies,	quotations from	statistics,	statistics,
	quotations from	relevant	analogies,	analogies,
	relevant	authorities)	quotations from	quotations from
	authorities) make	make	relevant	relevant
	appropriate	appropriate	authorities) make	authorities) make
	reference to	reference to	appropriate	reference to
	information or	information or	reference to	information or
	analysis that	analysis that	information or	analysis that
	significantly	generally	analysis that	minimally
	supports the	supports the	partially supports	supports the
	presentation or	presentation or	the presentation	presentation or
	establishes the	establishes the	or establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material			topic.	topic.
	Central message	Central message		Central message
	is compelling	is clear and	Central message	can be deduced
Control	(precisely stated,	the summer that	18 Dasically	DUL IS NOL
Central	appropriately	the supporting	understandable	explicitly stated in
wiessage	repeatea,	material.	but is not often	the presentation.

memorable, and	1	repeated and is	
strongly	1	not memorable.	
supported.)			

Source: Association of American Colleges and Universities **Date revised: February 15, 2022**

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Wowh

Assoc.Prof. Nguyen Van Sinh

Course Name: Internet of Things

Course Code: IT134IU

1. General information

Course designation	The course explains the architecture, components of Internet of Thing networks.					
Semester(s) in which the course is taught						
Person responsible for the course	Dr. Le Duy Tan					
Language	English					
Relation to curriculum	Elective (All programs)					
Teaching methods	Lecture, lesson, project, ser	minar.				
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120					
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1					
Required and recommended prerequisites for joining the course	Computer Networks					
Course objectives	The students will study the communication techniques between the components from short range to long range such as Bluetooth, Zigbee, Wi-fi, Lora, NB-IoT, Moreover, the data storage, organization and analytics are also studied in this course.					
Course learning outcomes	CLO 1. The ability of designing and implementing some Internet of Thing systems; CLO 2. The ability of collecting data then applying some data mining techniques to analyze the data in some IoT applications.					
	Competency level	Course learning outcome (CLO)				
	Knowledge	CLO 1				
	Skill	CLO 1 and CLO 2				
	Attitude	CLO 1				
Content	<i>The description of the cont</i> <i>of the content and the level</i> Weight: lecture session (3)	ents should clearly indicate the weighting hours)	g			

	Teaching levels: I (Introduce); T (Teach); U (Utilized	e)	
	Торіс	Weight	Level
	Week 1: Introduction to Internet of Things	1	Ι
	Week 2 : IoT applications (1st presentation from industry)	1	U
	Week 3: Sensors and actuators in IoTs	1	Т
	Week 4-8: Communication technologies in IoTs: PAN (Bluetooth, Zigbee), LAN (IEEE 802.11), WAN (LoRa, LTE)	5	Т
	Week 9: Data collection in IoT	1	T, U
	Week 10: IoT applications (cont.) (2nd presentation from industry)	1	U
	Week 11-14: Data analytics	4	T, U
	Week 15: Review	1	U
Examination forms	Multiple-choice questions, short-answer questions		•
Study and examination requirements	Attendance: A minimum attendance of 80 percent is the class sessions. Students will be assessed on the b participation. Questions and comments are strongly Assignments/Examination: Students must have mor points overall to pass this course.	s compulse basis of the encourage re than 50/	ory for eir class ed. 100
Reading list	 [1] Raj Kamal, Internet of Things Architecture and Design Principles, Mc Graw H [2] Hanes, David, et al. IoT fundamen technologies, protocols, and use cases for the Cisco Press, 2017. [3] Singh, Rajesh, et al. Internet of things with Arduino. CRC Press, 2019. [4] Dow, Colin. Internet of things programmi modern IoT solutions with the Raspberry Pi 3 Publishing Ltd 2018 	ill India, 2 tals: Net internet of Raspberry ng project and Pytho	2017 working f things. y Pi and ts: build n. Packt

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1		$\sqrt{\sqrt{}}$			$\checkmark\checkmark$	
2						\checkmark

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning	Resources
				activities	

1	Introduction to Internet of Things	1, 2	Homework	Lecture, Discussion, Inclass-Quiz	[1]
2	IoT applications (1st presentation from industry)	1	Homework	Lecture, Group work	[2]
3	Sensors and actuators in IoTs	1	Homework	Lecture, Discussion, Inclass-Quiz	[1]
4	Midterm		Written exam		
5 - 9	Communication technologies in IoTs: PAN (Bluetooth, Zigbee), LAN (IEEE 802.11), WAN (LoRa, LTE)	1	Homework	Lecture, Discussion, Inclass-Quiz	[1] [2]
10	Data collection in IoT	2	Homework	Lecture, Discussion, Inclass-Quiz	[1]
11	IoT applications (cont.) (2nd presentation from industry)	1, 2	Homework	Lecture, Group work	[2]
12 - 14	Data analytics	2	Homework	Lecture, Discussion, Inclass-Quiz, Presentation	[1]
15	Week 15: Review		Homework	Review-Test	
	Final exam		Written exam		

Assessment plan 4.

Assessment Type	CLO1	CLO2
Quiz (5%)		10%
Labs (20%)	20%	20%
Midterm examination (30%)	30%	20%
Projects/Presentations/ Report (5%)	25%	
Final examination (40%)	25%	50%

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	10	
content		
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	
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

Н	lolistic 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
			Issue/ problem	
	Issue/ problem to		to be	
	be considered	Issue/ problem to	considered	
	critically is stated	be considered	critically is	
	clearly and	critically is	stated but	
	described	stated, described,	description	Issue/ problem
	comprehensively,	and clarified so	leaves some	to be
	delivering all	that	terms	considered
	relevant	understanding is	undefined,	critically is
	information	not seriously	ambiguities	stated without
Explanation of	necessary for full	impeded by	unexplored,	clarification or
issues	understanding.	omissions.	boundaries	description.

			undetermined,	
			and/ or	
			backgrounds	
			unknown.	
			Information is	
			taken from	
			source(s) with	
	Information is		some	
	taken from	Information is	interpretation/	
	source(s) with	taken from	evaluation, but	
	enough	source(s) with	not enough to	Information is
	interpretation/	enough	develop a	taken from
	evaluation to	interpretation/	coherent	source(s)
	develop a	evaluation to	analysis or	without any
	comprehensive	develop a	synthesis.	interpretation/
Evidence	analysis or	coherent analysis	Viewpoints of	evaluation.
Selecting and	synthesis.	or synthesis.	experts are	Viewpoints of
using information	Viewpoints of	Viewpoints of	taken as	experts are
to investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	Shows an
			assumptions.	emerging
	Thoroughly		Identifies	awareness of
	(systematically		several	present
	and methodically)		relevant	assumptions
	analyzes own and		contexts when	(sometimes
	others'		presenting a	labels
	assumptions and	Identifies own	position. May	assertions as
	carefully	and others'	be more aware	assumptions).
	evaluates the	assumptions and	of others'	Begins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's own	contexts when
context and	presenting a	presenting a	(or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific position	Specific position		
	(perspective,	(perspective,	~	
	thesis/	thesis/hypothesis)	Specific	Specific
	hypothesis) is	takes into account	position	position
	ımagınatıve,	the complexities	(perspective,	(perspective,
	taking into	of an issue.	thesis/	thesis/
Student's	account the	Others' points of	hypothesis)	hypothesis) is
position	complexities of	view are	acknowledges	stated, but 1s
(perspective,	an issue. Limits	acknowledged	different sides	simplistic and
thesis/hypothesis)	of position	within position	of an issue.	obvious.

(p th	perspective, nesis/	(perspective, thesis/		
hypothesis) are		hypothesis).		
ac	cknowledged.			
0	thers' points of			
V1	iew are			
sy	ynthesized			
W	or this position			
(p	berspective,			
tn 1	lesis/			
ny	ypotnesis).		Conclusion in	
			Conclusion is	
C	analyziana and		to information	Conclusion is
	onclusions and	Conclusion is	(hereaver	conclusion is
re	enated outcomes	Conclusion is	(because	ticonsistently
(0	d implications)	ronge of	abosen to fit	the to some of
al	nu implications)	information	the desired	information
al	e logical allu	including	analusion):	discussed:
in	formed	opposing	conclusion),	related
	valuation and	viewpoints:	outcomes	outcomes
ah	hility to place	related outcomes	(consequences	(consequences
Conclusions and ex	vidence and		and	and
related outcomes ne	erspectives	and implications)	implications)	implications)
(implications and di	iscussed in	are identified	are identified	are
consequences) pr	riority order	clearly	clearly	oversimplified

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and			
	conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction and	pattern (specific	
	the body, and	conclusion,	introduction and	Organizational
	transitions) is	sequenced	conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and is	transitions) is	the body, and	sequenced
	skillful and	clearly and	transitions) is	material within the
	makes the	consistently	intermittently	body, and
	content of the	observable	observable	transitions) is not
	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.

	Language		Language	
	choices are	Language	choices are	
	imaginative	choices are	mundane and	Language choices
	memorable and	thoughtful and	commonnlace	are unclear and
	compelling and	generally	and nartially	minimally support
	enhance the	support the	support the	the effectiveness
	effectiveness of	effectiveness of	effectiveness of	of the
	the presentation	the presentation	the presentation	presentation
	L'onguaga in	L'anguaga in	L'anguaga in	L'anguaga in
	presentation is	presentation is	presentation is	presentation is not
τ	appropriate to	appropriate to	appropriate to	appropriate to
Language	audience.	audience.	audience.	audience.
	Delivery	DI	Delivery	Delivery
	techniques	Delivery	techniques	techniques
	(posture, gesture,	techniques	(posture, gesture,	(posture, gesture,
	eye contact, and	(posture, gesture,	eye contact, and	eye contact, and
	vocal	eye contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the
	speaker appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
		Supporting		
	A variety of	materials		Insufficient
	types of	(explanations,	Supporting	supporting
	supporting	examples,	materials	materials
	materials	illustrations,	(explanations,	(explanations,
	(explanations,	statistics,	examples,	examples,
	examples,	analogies,	illustrations,	illustrations,
	illustrations,	quotations from	statistics,	statistics,
	statistics,	relevant	analogies,	analogies,
	analogies,	authorities)	quotations from	quotations from
	quotations from	make	relevant	relevant
	relevant	appropriate	authorities) make	authorities) make
	authorities) make	reference to	appropriate	reference to
	appropriate	information or	reference to	information or
	reference to	analysis that	information or	analysis that
	information or	generally	analysis that	minimally
	analysis that	supports the	partially supports	supports the
	significantly	presentation or	the presentation	presentation or
	supports the	establishes the	or establishes the	establishes the
	presentation or	presenter's	presenter's	presenter's
	establishes the	credibility/	credibility/	credibility/
Supporting	presenter's	authority on the	authority on the	authority on the
	credibility/	tonic	tonic	topic

	authority on the topic.			
	Central message			
	is compelling			
	(precisely stated,		Central message	
	appropriately	Central message	is basically	Central message
	repeated,	is clear and	understandable	can be deduced
	memorable, and	consistent with	but is not often	but is not
Central	strongly	the supporting	repeated and is	explicitly stated in
Message	supported.)	material.	not memorable.	the presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering ₄₇

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Mobile Application Development

Course Code: IT133IU

1. General miorn						
Course designation	Advan	ced programming co	urse with focus on mobile environment			
Semester(s) in which the course is taught	7					
Person responsible for the course	MSc. I	Le Thanh Son				
Language	Englis	h				
Relation to curriculum	Electiv	e (All programs)				
Teaching methods	Lectur	e				
Workload (incl. contact hours, self- study hours)	Total v Contac sessior Private 120	vorkload: 195 et hours (please specie n, etc.): 45 (lecture) + e study including exam	fy whether lecture, exercise, laboratory 30 (laboratory) mination preparation, specified in hours:			
Credit points	Numbo Lectur Labora	er of credits: 4 e: 3 ntory: 1				
Required and recommended prerequisites for joining the course	Object	-oriented analysis and	d design			
Course objectives	This c progra throug compo with co mobile writing in form	ourse is designed to mming in the mobile hout the course. The nents, concepts, struct ommon user interface e etc. Introduction to g Android application n of lab exercise prog	o introduce and familiarize students with environment: Android platform will be used e course starts with introductions to basic etures of Android applications then move on e elements, persistent storage, database for o most common tools and techniques for a is also included with hands on experience gramming project.			
Course learning outcomes	CLO 1 Androi CLO 2 databa CLO 3 CLO 4	CLO 1. Understand the structure of mobile application, especially Android application CLO 2. Understand most common mobile platform user interface, database, services CLO 3. Able to develop mobile application CLO 4. Team working				
		Knowledge	1			

1. General information

	1							
		Skill	2, 3					
		Attitude	4					
Content	The de the cor Weigh Teachi	<i>The description of the contents should clearly indicate the weighting of the content and the level.</i> Weight: lecture session (3 hours)						
		Tonic Weight Level						
	In	troduction to mobile	nrogramming	3	I			
	A	ndroid and Modal Vi	ew Controller	3	I, T			
		ctivity Lifecycle		3	I. T			
	A	droid SDK Versions	and Compatbility	3	I, T			
	C	reating UI: Lavout an	d Widgets	3	T, U			
	Li	stFragment	6	3				
	V	iewPager		3	T, U			
	D	ialogs	3	T, U				
	М	/IediaPlayer		3	T, U			
	A	Action Bar		3	T, U			
	Sa	wing and Loading Lo	3	T, U				
	Co	ontext Menu and Cor	3	T, U				
	Та	aking Pictures and Ha	andling Images	3	T, U			
	In	tents		3	T, U			
	Bi	rowsing the Web & V	WebView	3	T, U			
Examination forms	Multip	le-choice questions,	short-answer question	S				
Study and	Attend	ance: A minimum at	tendance of 80 percent	t is compu	lsory for			
examination	the cla	ss sessions. Students	will be assessed on th	e basis of	their class			
requirements	participation. Questions and comments are strongly encouraged.							
	Assign	ments/Examination:	Students must have m	ore than 5	0/100			
	points	overall to pass this co	ourse.					
Reading list	1. C	C. Stewart, K. Marsci Nerd Ranch Guide 3r	cano, Android Program d. 2017	mming: T	he Big			
	2. I	D. Griffiths, Head Fir Guide 1st, 2015	st Android Developm	ent: A Bra	in-Friendly			

2. Learning Outcomes Matrix

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					

2	x				
3		XX			XXX
4			X		XXX

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to mobile programming	1	Quiz	Lecture	2
2	Android and Modal View Controller	1	Quiz	Lecture	2
3	Activity Lifecycle	1	Quiz	Lecture	2
4	Adroid SDK Versions and Compatbility	1	Quiz, Lab, Midterm	Lecture, Discussion	2
5	Creating UI: Layout and Widgets	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
6	ListFragment	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
7	ViewPager	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
8	Dialogs	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
	Midterm				
9	MediaPlayer	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
10	Action Bar	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
11	Saving and Loading Local Files	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
12	Context Menu and Contextual Action Mode	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
13	Taking Pictures and Handling Images	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
14	Intents	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
15	Browsing the Web & WebView	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
	Final exam				

4. Assessment plan

Quiz / Assigment (10%)	50%	10%	10%	70%
Labs (20%)	10%	30%	30%	30%
Midterm examination (30%)	30%	30%	30%	
Final examination (40%)	10%	30%	30%	

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/A	Assignme	ent:
Date:		-	•
	Evalu	ator:	
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and summarizes principal	10		
content			
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		
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

Н	lolistic 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.

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

5.3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	relevance of contexts when presenting a position.		position. May be more aware of others' assumptions than one's own (or vice	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.

Oral communication value rubric for evaluating presentation tasks:

Capstone	Milestone	Benchmark

194

l l				
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and			
	conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction and	pattern (specific	
	the body, and	conclusion,	introduction and	Organizational
	transitions) is	sequenced	conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion.
	observable and is	transitions) is	the body, and	sequenced
	skillful and	clearly and	transitions) is	material within the
	makes the	consistently	intermittently	body, and
	content of the	observable	observable	transitions) is not
	presentation	within the	within the	observable within
Organization	cohesive.	presentation.	presentation.	the presentation.
o i guine union	Language	P	Language	
	choices are	Language	choices are	
	imaginative	choices are	mundane and	Language choices
	memorable and	thoughtful and	commonnlace	are unclear and
	compelling and	generally	and nartially	minimally support
	enhance the	support the	support the	the effectiveness
	effectiveness of	effectiveness of	effectiveness of	of the
	the presentation	the presentation	the presentation	nresentation
	L'anguage in	L'anguage in	L'anguage in	L'anguage in
	presentation is	presentation is	presentation is	presentation is not
	appropriate to	appropriate to	appropriate to	appropriate to
Languaga	appropriate to	appropriate to	appropriate to	appropriate to
Language	Delivery	audichee.	Delivery	Delivery
	techniques	Delivery	techniques	techniques
	(posture gesture	techniques	(posture gesture	(posturo gosturo
	(positie, gesture,	(posture gesture	(positile, gesitile,	(positie, gesture,
	eye contact, and	(posture, gesture,	eye contact, and	eye contact, and
	vocal	eye contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	data at from the
	make the	expressiveness)	make the	uerraci from the
	presentation	make the	presentation	understandability
	compeniing, and	presentation	understandable,	of the
	speaker appears	interesting, and	and speaker	presentation, and
D. I.	polished and	speaker appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of	Supporting		
	supporting	materials		Insufficient
	materials	(explanations,	Supporting	supporting
	(explanations,	examples,	materials	materials
	examples,	illustrations,	(explanations,	(explanations,
	illustrations,	statistics,	examples,	examples,
	statistics,	analogies,	illustrations,	illustrations,
	analogies,	quotations from	statistics,	statistics,
	quotations from	relevant	analogies,	analogies,
	relevant	authorities)	quotations from	quotations from
	authorities) make	make	relevant	relevant
	appropriate	appropriate	authorities) make	authorities) make
	reference to	reference to	appropriate	reference to
	information or	information or	reference to	information or
	analysis that	analysis that	information or	analysis that
	significantly	generally	analysis that	minimally
	supports the	supports the	partially supports	supports the
	presentation or	presentation or	the presentation	presentation or
	establishes the	establishes the	or establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central message			
	is compelling			
	(precisely stated,		Central message	
	appropriately	Central message	is basically	Central message
	repeated,	is clear and	understandable	can be deduced
	memorable, and	consistent with	but is not often	but is not
Central	strongly	the supporting	repeated and is	explicitly stated in
Message	supported.)	material.	not memorable.	the presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Wowh

Assoc.Prof. Nguyen Van Sinh

Course Name: Human-Computer Interaction

1. General information This course provides students with fundamental interaction principles Course designation between human and computers. Semester(s) in which 7,8 the course is taught Person responsible for Dr. Vi Chi Thanh the course Language English Relation to Elective (CS) curriculum Lecture, lesson, project, seminar. Teaching methods Total workload: 195 Workload (incl. Contact hours (please specify whether lecture, exercise, laboratory contact hours, selfsession, etc.): 45 (lecture) + 30 (laboratory) study hours) Private study including examination preparation, specified in hours: 120 Number of credits: 4 Credit points Lecture: 3 Laboratory: 1 Required and None recommended prerequisites for joining the course This course provides students with fundamental interaction principles Course objectives between human and computers. CLO 1. Know how to gather requirements. Course learning CLO 2 Apply human-computer interaction principles in user interface outcomes design process CLO 3 Choose the appropriate interface evaluation method CLO 4. Understand different design principles for mobile applications, the Web, and emerging technologies. Competency **Course learning outcome** level (CLO)2, 3, 4 Knowledge 1 Skill 1 Attitude

Course Code: IT044IU

Content	The description of the contents should clearly indicate the weighting			
	of the c	ontent and the level.		
	Weight	: lecture session ($\frac{3}{2}$ hours)	άτι	
	Teachir	ng levels: I (Introduce); I (Teach); U (Utilize)	
		Торіс	Weigh	Leve
			t	1
		Human factors	1	Ι
		Human perception and cognition principles	2	Т
		User-centered design	2	T,U
		Requirements gathering techniques	1	T,U
		Interface design process	2	T,U
		Prototyping techniques	2	T,U
		Interface evaluation methodology	1	T,U
		Interaction styles and techniques	1	Т
		HCI for mobile applications, the Web, and emerging technologies	2	T,U
		Data analysis	1	T,U
Examination forms	Short-a	nswer questions		
Study and	Attenda	ance: A minimum attendance of 80 per	rcent is co	ompulsory for
examination	the clas	s sessions. Students will be assessed c	on the base	is of their class
requirements	particip	ation. Questions and comments are str	rongly en	couraged.
	Assign	nents/Examination: Students must hav	ve more th	nan 50/100
	points of	overall to pass this course.		
Reading list	[1] Sha Beyond	rp, H., Preece, J., Rogers, Y. (2019). I Human-Computer Interaction. United	nteraction d Kingdor	n Design: n: Wiley.
	[2] Dix Interact	, A. (2003). Human-computer ion. Germany: Pearson/Prentice-Hall.		
	[3] Mac	cKenzie, I. S. (2012). Human-Comput	er Interac	tion: An
	Empirio	cal Research Perspective. Netherlands	: Elsevier	Science.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	1	2	3	4	5	6
1			Х			
2	Х				Х	
3		Х			Х	
4		X				

Week	Торіс	CLO	Assessme nts	Learning activities	Resources
1	Human factors	1	Midterm exam	In-class activities	
2,3	Human perception and cognition principles	2	Midterm exam	In-class activities	
4,5	User-centered design	2	Midterm exam, Project, Lab quiz	In-class activities	
6	Requirements gathering techniques	1	Midterm exam, Project	In-class activities	
7,8	Interface design process	2	Midterm exam, Project	In-class activities	
Midter	rm exam				
9,10	Prototyping techniques	2	Project	In-class activities	
11	Interface evaluation methodology	3	Final exam, Project	In-class activities	
12	Interaction styles and techniques	3	Final exam	In-class activities	
13,14	HCI for mobile applications, the Web, and emerging technologies	4	Lab quiz	In-class activities	
15	Data analysis	2, 4	Final exam, Project	In-class activities	
Final e	exam				

3. Planned learning activities and teaching methods

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%

Final examination (40%)	30%	50%	50%
-------------------------	-----	-----	-----

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for V	Writter	1 Repo	rts	
Student: HW/Assignme	Student: HW/Assignment:			
Evaluator:				
Date:				
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and	10			
summarizes principal content				
Introduction demonstrates thorough knowledge	15			
of relevant background and prior work				
Analysis and discussion demonstrate good	30			
subject mastery				
Summary and conclusions appropriate and	5			
complete				
Organization (10%)				
Distinct introduction, body, conclusions	5			
Content clearly and logically organized, good				
transitions				
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			
S	Description			
c				
0				
r				
e				
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.			

200

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
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	
	critically is stated	to be considered	terms	
	clearly and	critically is	undefined.	
	described	stated.	ambiguities	
	comprehensively	described and	unexplored	Issue/ problem
	delivering all	clarified so that	boundaries	to be considered
	relevant	understanding is	undetermined	critically is
Explana	information	not seriously	and/ or	stated without
tion of	necessary for full	impeded by	backgrounds	clarification or
issues	understanding.	omissions.	unknown.	description.
155405	understanding.		Information is	
			taken from	
			source(s) with	
	Information is	Information is	some	
Evidenc	taken from	taken from	interpretation/	
e	source(s) with	source(s) with	evaluation but	
Selecting	enough	enough	not enough to	
and	interpretation/	interpretation/	develop a	Information is
usino	evaluation to	evaluation to	coherent	taken from
informati	develop a	develop a	analysis or	source(s)
on to	comprehensive	coherent	synthesis	without any
investiga	analysis or	analysis or	Viewpoints of	interpretation/
te a	synthesis.	synthesis.	experts are	evaluation.
point of	Viewpoints of	Viewpoints of	taken as	Viewpoints of
view or	experts are	experts are	mostly fact.	experts are taken
conclusi	questioned	subject to	with little	as fact, without
on	thoroughly.	questioning.	questioning.	question.
	Thoroughly	Identifies own	Ouestions	Shows an
Influenc	(systematically and	and others'	some	emerging
e of	methodically)	assumptions and	assumptions.	awareness of
context	analyzes own and	several relevant	Identifies	present
and	others'	contexts when	several	assumptions

assumpt ions	assumptions and carefully evaluates the relevance of contexts when presenting a position.	presenting a position.	relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	(sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student' s position (perspec tive, thesis/hy pothesis)	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/hypothesi s) 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.
Conclusi ons and related outcome s (implica tions and consequ ences)	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.

Oral communication value rubric for evaluating presentation tasks:

Capstone	Milestone		Benchmark	
4	3	2	1	
	Organizational			
----------	---------------------------------	------------------	------------------	----------------------
	nattern (specific			
	introduction and	Organizational		
	conclusion	nattorn	Organizational	
		(an a sife	organizational	
	sequencea	(specific	pattern	
	material within	introduction	(specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced material
	is skillful and	clearly and	transitions) is	within the body,
	makes the	consistently	intermittently	and transitions) is
	content of the	observable	observable	not observable
Organiz	presentation	within the	within the	within the
ation	cohesive.	presentation.	presentation.	presentation.
			Language	•
	Language	Language	choices are	
	choices are	choices are	mundane and	
	imaginative.	thoughtful and	commonplace	
	memorable, and	generally	and partially	Language choices
	compelling, and	support the	support the	are unclear and
	enhance the	effectiveness of	effectiveness of	minimally support
	effectiveness of	the	the	the effectiveness of
	the presentation. presentation.		presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is not
Languag	appropriate to	appropriate to	appropriate to	appropriate to
e	audience	audience	audience	audience
C .	Delivery	uuurenee.	Delivery	uudionee.
	techniques	Delivery	techniques	Delivery
	(posture	techniques	(posture	techniques
	gesture eve	(posture	gesture eve	(posture gesture
	contact and	gesture eve	contact and	eve contact and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling. and	presentation	understandable.	of the presentation.
	speaker appears	interesting, and	and speaker	and speaker
	polished and	speaker appears	appears	appears
Deliverv	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	
	(explanations,	(explanations,	(explanations,	Insufficient
	examples,	examples,	examples,	supporting
	illustrations,	illustrations,	illustrations,	materials
	statistics,	statistics,	statistics,	(explanations,
	analogies,	analogies,	analogies,	examples,
	quotations from	quotations from	quotations from	illustrations,
	relevant	relevant	relevant	statistics,
	authorities)	authorities)	authorities)	analogies,
	make	make	make	quotations from
	appropriate	appropriate	appropriate	relevant
	reference to	reference to	reference to	authorities) make
	information or	information or	information or	reference to
	analysis that	analysis that	analysis that	information or
	significantly	generally	partially	analysis that
	supports the	supports the	supports the	minimally supports
	presentation or	presentation or	presentation or	the presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
Supporti	credibility/	credibility/	credibility/	credibility/
ng	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central message			
	is compelling			
	(precisely		Central	
	stated,	Central	message is	
	appropriately	message is	basically	Central message
	repeated,	clear and	understandable	can be deduced but
	memorable, and	consistent with	but is not often	is not explicitly
Central	strongly	the supporting	repeated and is	stated in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Mont

Assoc.Prof. Nguyen Van Sinh

Course Name: Cloud Computing

Course Code: IT164IU

1. General infor	mation
Course designation	The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure.
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Le Duy Tan
Language	English
Relation to curriculum	Elective (CS, NE, CE)
Teaching methods	Lecture
Workload (incl. contact hours, self- study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours. Private study including examination preparation, specified in hours: 120 hours.
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Computer Networks
Course objectives	This course concentrates on parallel programming techniques for cloud computing and large-scale distributed systems which form the cloud infrastructure. The topics include overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art solutions for cloud computing developed by Google, Amazon, Microsoft, Yahoo, VMWare, etc. Students will also apply what they learn in one programming assignment and one project executed over Amazon Web Services.
Course learning outcomes	CLO 1. Analyze the trade-offs between deploying applications in the cloud and over the local infrastructure.CLO 2. Able to deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.

	CLO 3. Solve a real-world problem using cloud computing through group collaboration.				
		Competency level	Course learning of (CLO)	utcome	
		Knowledge	1		
		Skill	2, 3		
		Attitude	3		
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)				weighting
	Тор	Dic		Weigh t	Level
	Intr	oduction to Cloud Com	puting	1	Ι
	Clo	Cloud Computing Platforms			Т
	Para	Parallel Programming in the Cloud			T, U
	Dist	Distributed Storage Systems			T, U
	Virt	Virtualization			T, U
	Clo	ud Security		2	Т
	Mu	lticore Operating System	ns	1	Т
Examination forms	Short-answer questions, Programming exercises				
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	 Rountree, Derrick, and Ileana Castrillo. <i>The basics of cloud computing: Understanding the fundamentals of cloud computing in theory and practice</i>. Newnes, 2013. Patterson, Scott. Learn AWS Serverless Computing: A Beginner's Guide to Using AWS Lambda, Amazon API Gateway, and Services from Amazon Web Services. Packt Publishing Ltd, 2019. 				

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO\SL OT	1	2	3	4	5	6
1	Х					

2	XX		
3			Х

3. Planned learning activities and teaching methods

We ek	Торіс	CLO	Assessment s	Learning activities	Resource s
1	Introduction to Cloud Computing	1	Quiz	Lecture	1
2	Cloud Computing Platforms – Part 1	1	Quiz	Lecture	1
3	Cloud Computing Platforms – Part 2	1	Quiz	Lecture, Discussion , In-class Exercise	2
4	Cloud Computing Platforms – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
5	Parallel Programming in the Cloud – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
6	Parallel Programming in the Cloud – Part 2	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	2
7	Parallel Programming in the Cloud – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
8	Distributed Storage Systems – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
Midt	term				
9	Distributed Storage Systems – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
10	Distributed Storage Systems – Part 3	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
11	Virtualization – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion	1

				, In-class Exercise	
12	Virtualization – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
13	Cloud Security – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1, 2
14	Cloud Security – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
15	Multicore Operating Systems	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
Final	Final				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz / Assigment (10%)	50%	10%	10%
Labs (20%)	10%	30%	30%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	10%	30%	30%

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

5. Rubrics (optional)

5.4. Grading checklist

Grading checklist for Written Reports				
Student: HW	HW/Assignment:			
Eva	luator:	•••••		
Date:				
		Max.	Score	Comments
Technical content (60%	%)			
Abstract clearly identifies purpose an	d	10		
summarizes principal content				
Introduction demonstrates thorough		15		
knowledge of relevant background and prior				
work				

Analysis and discussion demonstrate good	30	
subject mastery		
Summary and conclusions appropriate and	5	
complete		
Organization (10%)		
Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
Presentation (20%)		
Correct spelling, grammar, and syntax	10	
Clear and easy to read	10	
Quality of Layout and Graphics (10%)	10	
TOTAL SCORE	100	

5.5. 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.

5.6. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Miles	tone	Benchmark
	4	3	2	1
			Issue/ problem	
	Issue/ problem to		to be	
	be considered	Issue/ problem	considered	
	critically is stated	to be considered	critically is	
	clearly and	critically is	stated but	
	described	stated,	description	
	comprehensively,	described, and	leaves some	Issue/ problem
	delivering all	clarified so that	terms	to be considered
Expla	relevant	understanding is	undefined,	critically is
natio	information	not seriously	ambiguities	stated without
n of	necessary for full	impeded by	unexplored,	clarification or
issues	understanding.	omissions.	boundaries	description.

			undetermined.	
			and/ or	
			backgrounds	
			unknown.	
Evide			Information is	
nce			taken from	
Selecti			source(s) with	
ng	Information is	Information is	some	
and	taken from	taken from	interpretation/	
using	source(s) with	source(s) with	evaluation, but	
inform	enough	enough	not enough to	
ation	interpretation/	interpretation/	develop a	Information is
to	evaluation to	evaluation to	coherent	taken from
investi	develop a	develop a	analysis or	source(s)
gate a	comprehensive	coherent	synthesis.	without any
point	analysis or	analysis or	Viewpoints of	interpretation/
of	synthesis.	synthesis.	experts are	evaluation.
view	Viewpoints of	Viewpoints of	taken as	Viewpoints of
or	experts are	experts are	mostly fact,	experts are taken
conclu	questioned	subject to	with little	as fact, without
sion	thoroughly.	questioning.	questioning.	question.
			Questions	G1
			some	Shows an
	751 11		assumptions.	emerging
	I norougnly		Identifies	awareness of
	(systematically and		several	present
	methodically)		relevant	assumptions
Influe	analyzes own and	Idantifica own	contexts when	(sometimes
Influe nos of	others	and others!	presenting a	labels assertions
	assumptions and	and others	he means arrange	as assumptions).
conte	the relevance of	assumptions and	of others'	identify some
At and	anterests when	several relevant	orouners	a antarta when
	presenting a	presenting a	then one's own	presenting a
ntions	presenting a	presenting a	(or vice verse)	presenting a
puons	Specific position	Specific	(of vice versa).	position.
Stude	(nersnective	position		
nt'e	(perspective, thesis/ hypothesis)	(nersnective		
nositi	is imaginative	thesis/hynothesi	Specific	
on	taking into account	s) takes into	position	Specific position
(ners	the complexities of	account the	(nerspective	(nerspective
nectiv	an issue. Limits of	complexities of	thesis/	thesis/
росон, е.	position	an issue. Others'	hypothesis)	hypothesis) is
-, thesis/	(perspective	points of view	acknowledges	stated, but is
hynot	thesis/ hypothesis)	are	different sides	simplistic and
hesis)	are acknowledged.	acknowledged	of an issue.	obvious.

	Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	within position (perspective, thesis/ hypothesis).		
			Conclusion is	
		Conclusion is	logically tied	
Concl		logically tied to	to information	
usions	Conclusions and	a range of	(because	
and	related outcomes	information,	information is	
relate	(consequences and	including	chosen to fit	Conclusion is
d	implications) are	opposing	the desired	inconsistently
outco	logical and reflect	viewpoints;	conclusion);	tied to some of
mes	student's informed	related	some related	the information
(impli	evaluation and	outcomes	outcomes	discussed;
cation	ability to place	(consequences	(consequences	related outcomes
s and	evidence and	and	and	(consequences
conse	perspectives	implications)	implications)	and
quenc	discussed in	are identified	are identified	implications) are
es)	priority order.	clearly.	clearly.	oversimplified.

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced material
	is skillful and	clearly and	transitions) is	within the body,
	makes the	consistently	intermittently	and transitions) is
Orga	content of the	observable	observable	not observable
nizati	presentation	within the	within the	within the
on	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language choices
	choices are	choices are	choices are	are unclear and
	imaginative,	thoughtful and	mundane and	minimally support
Lang	memorable, and	generally	commonplace	the effectiveness of
uage	compelling, and	support the	and partially	the presentation.

	enhance the	effectiveness of	support the	Language in
	effectiveness of	the	effectiveness of	presentation is not
	the presentation.	presentation.	the	appropriate to
	Language in	Language in	presentation.	audience.
	presentation is	presentation is	Language in	
	appropriate to	appropriate to	presentation is	
	audience.	audience.	appropriate to	
			audience.	
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the presentation,
	speaker appears	interesting, and	and speaker	and speaker
Delive	polished and	speaker appears	appears	appears
ry	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	
	(explanations,	(explanations,	(explanations,	Insufficient
	examples,	examples,	examples,	supporting
	illustrations,	illustrations,	illustrations,	materials
	statistics,	statistics,	statistics,	(explanations
	0000000			(explanations,
	allalogies,	analogies,	analogies,	examples,
	quotations from	analogies, quotations from	analogies, quotations from	examples, illustrations,
	quotations from relevant	analogies, quotations from relevant	analogies, quotations from relevant	examples, illustrations, statistics,
	quotations from relevant authorities)	analogies, quotations from relevant authorities)	analogies, quotations from relevant authorities)	examples, illustrations, statistics, analogies,
	quotations from relevant authorities) make	analogies, quotations from relevant authorities) make	analogies, quotations from relevant authorities) make	examples, illustrations, statistics, analogies, quotations from
	authorities) make appropriate	analogies, quotations from relevant authorities) make appropriate	analogies, quotations from relevant authorities) make appropriate	examples, illustrations, statistics, analogies, quotations from relevant
	quotations from relevant authorities) make appropriate reference to	analogies, quotations from relevant authorities) make appropriate reference to	analogies, quotations from relevant authorities) make appropriate reference to	examples, illustrations, statistics, analogies, quotations from relevant authorities) make
	quotations from relevant authorities) make appropriate reference to information or	analogies, quotations from relevant authorities) make appropriate reference to information or	analogies, quotations from relevant authorities) make appropriate reference to information or	examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to
	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or
	quotations from relevant authorities) make appropriate reference to information or analysis that significantly	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially	examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that
	authorities) make appropriate reference to information or analysis that significantly supports the	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the	examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports
	quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or	examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or
Sector	quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the	examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the
Supp	quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's	examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's
Supp orting	quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/	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/
Supp orting Mater	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	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	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	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

	Central message			
	(precisely		Central	
	stated,	Central	message is	
	appropriately	message is	basically	Central message
Centr	repeated,	clear and	understandable	can be deduced but
al	memorable, and	consistent with	but is not often	is not explicitly
Messa	strongly	the supporting	repeated and is	stated in the
ge	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: August 28, 2023

Ho Chi Minh City, 28/08/2023 Dean of School of Computer Science and Engineering

Mont

Assoc.Prof. Nguyen Van Sinh

Course Name: Security Technology and Implementation

Course Code: IT165IU

1.	General information			
	Course designation	The course will concentrate on security technologies that can be employed to safeguard and maintain a network. The course will also cover risk management, business continuity and recovery planning, operations security, access control systems, and software development security.		
	Semester(s) in which the course is taught	7,9		
	Person responsible for the course	Dr. Le Hai Duong		
	Language	English		
	Relation to curriculum	Compulsory		
	Teaching methods	Lecture, lesson, project, seminar.		
	Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120		
	Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1		
	Required and recommended prerequisites for joining the course	Computer Networks		
	Course objectives	This course introduces students to information security principles, cryptography systems (symmetric and public key encryptions), risk management, security architecture and design, business continuity operations security, access control systems, protecting TCP/IP network, firewalls, virtual private network, IPSec, software development security.		
	Course learning outcomes	CLO 1. Gain understanding of information security and the cryptography concepts including symmetric key encryption, hash function, message authentication code, public key encryption, digital signature and digital envelope;		

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	CLO 2 impler CLO 3 CLO 4 CLO 5	CLO 2. Apply the concepts of authentication and authorization in implementing secure systems and networks; CLO 3. Analyze and evaluate security risk and security design; CLO 4. Understand and apply software development security; CLO 5. Apply security technologies in operations.			
		Competency level	Course learning out (CLO)	tcome	
	Knowledge CLO1, CLO2, CLO4			4, CLO5	
		Skill	CLO2, CLO3, CLO4	4, CLO6	
		Attitude			
Content The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)				ndicate th tilize)	e
	Тор	oic		Weigh	Leve
	Info	rmation security n	rinciples	ι 1	T
	Gov	vernance and risk m	anagement.	1	T.U
	Seci	rity architecture at	nd design.	1	T
	Busi	iness continuity and ning;	d disaster recovery	1	T,U
	Ope	ration security;		2	T,U
	Acc	ess control systems	s and methodology;	1	Т
	Cry	ptography;		2	T,U
	Ove secu	rview network and rity;	telecommunications	1	T,U
	Basi	ic security infrastru	ctures and routers;	1	Т
	Fire	walls		1	T,U
	Intru prot	usion detection systems	tems and intrusion	1	Т
	Virt	ual private network	and IPSec;	1	Т
	Soft	ware Development	t security.	1	T,U
Examination forms	Multip	le-choice question	s, short-answer questic	ons	
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				pulsory sis of ongly n 50/100

Reading list	1.	William Stallings and Lawrence Brown, Computer
		Security - Principles and Practice 4th edition, 2018
	2.	Mark S. Merkow and Jim Breithaupt, Information
		Security: Principles and Practices, 2nd edition, 2014.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-6) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х		Х	Х		
2		Х				
3	Х					
4	Х					
5	Х					
6	Х					

3. Planned learning activities and teaching methods

Wee k	Торіс	CLO	Assessments	Learning activities	Resour ces
1	Information security principles	1	Quiz, Exam	Lecture, Exercises, Lab	[1,2]
2	Governance and risk management;	3	Quiz, Exam	Lecture, Lab	[2]
3	Security architecture and design;	3	Quiz, Exam	Lecture, Lab	[2]
4	Business continuity and disaster recovery planning;	3	Quiz, Exam	Lecture, Lab	[2]
5,6	Operation security;	5	Quiz, Exam	Lecture, Lab	[2]
7	Access control systems and methodology;	2		Lecture, Lab	
	Midterm exam				
8,9	Cryptography;	1	Quiz, Exam	Lecture	[1]
10	Overview network and telecommunications;	5	Quiz, Exam	Lecture, Lab	[2]
11	Basic security infrastructures and routers;	5	Quiz, Exam	Lecture, Lab	[2]
12	Firewalls	5	Quiz, Exam	Lecture, Exercises,	[1,2]

13	Intrusion detection systems and intrusion protection systems	5	Quiz, Exam	Lecture, Exercises,	[1,2]
14	Virtual private network and IPSec;	5	Quiz, Exam	Lecture, Lab	[1,2]
15	Software Development security.	4	Quiz, Exam	Lecture	[2]
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Midterm examination (30%)	30%	80%	55%		10%
Final examination (40%)	40%			75%	60%
Exercises/ Quiz (30%)	30%	20%	45%	25%	30%

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

- 1. 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.↔
- 5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports				
Student: HW/Ass	HW/Assignment:			
Evaluato	r:			
Date:				
·····				
		Max.	Score	Comments
Technical content (60%)				
Abstract clearly identifies purpose and		10		
summarizes principal content				
Introduction demonstrates thorough knowledge				
of relevant background and prior work				
Analysis and discussion demonstrate good		30		
subject mastery				
Summary and conclusions appropriate and		5		
complete				

Organization (10%)		
Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
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 rub	oric 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

Explan ation 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.
			Information is	
			taken from	
	Information is	Information is	some	
Eviden	taken from	taken from	interpretation/	
ce	source(s) with	source(s) with	evaluation, but	
Selectin	enough	enough	not enough to	Information is
g and	interpretation/	interpretation/	develop a	taken from
using	evaluation to	evaluation to	coherent	source(s)
informa	develop a	develop a	analysis or	without any
tion to	comprehensive	coherent	synthesis.	interpretation/
investig	analysis or	analysis or	viewpoints of	evaluation.
ale a	Synthesis. Viewpoints of	Synthesis. Viewpoints of	experts are	v lewpoints of
view or	v icwpolitits 01	v iewpoints of	nakell as	taken as fact
conclus	auestioned	subject to	with little	without
ion	thoroughly.	auestioning	auestioning	auestion.
		- <u>1</u> 8.	Questions	Shows an
	Thoroughly		some	emerging
	(systematically and		assumptions.	awareness of
	methodically)		Identifies	present
	analyzes own and		several	assumptions
	others'	Identifies own	relevant	(sometimes
Influen	assumptions and	and others'	contexts when	labels
ce of	carefully evaluates	assumptions and	presenting a	assertions as
context	the relevance of	several relevant	position. May	assumptions).
and	contexts when	contexts when	be more aware	Begins to
assump	presenting a	presenting a	or others	contexts when
110113	position.	position.	assumptions	COLLEARS WHELL

			than one's own	presenting a
			(of vice versa).	position.
Studen t's positio n (perspe ctive, thesis/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	Specific position (perspective, thesis/hypothesi s) takes into account the complexities of an issue. Others' points of view are acknowledged within position	Specific position (perspective, thesis/ hypothesis)	Specific position (perspective, thesis/ hypothesis) is
vpothe	(perspective,	thesis/	different sides	simplistic and
sis)	thesis/ hypothesis).	hypothesis).	of an issue.	obvious.
	Conclusions and	Conclusion is logically tied to	Conclusion is logically tied to information (because	Conclusion is
Conclu	related outcomes	information,	information is	inconsistently
sions	(consequences and	including	chosen to fit	tied to some of
and	implications) are	opposing	the desired	the information
related	logical and reflect	viewpoints;	conclusion);	discussed;
outcom	student's informed	related	some related	related
es	evaluation and	outcomes	outcomes	outcomes
(implic	ability to place	(consequences	(consequences	(consequences
ations	evidence and	and	and	and
and	perspectives	implications)	implications)	implications)
conseq	discussed in	are identified	are identified	are
uences)	priority order.	clearly.	clearly.	oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

Capstone	Milestone		Benchmark
4	3	2	1

Organi	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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within
zation	cohesive.	presentation.	presentation.	the presentation.
Langu age	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 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	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and
Deliver v	polished and confident	speaker appears	appears tentative	speaker appears
Langu age Deliver y	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience. Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience. Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience. Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience. Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

Suppor ting Materi al	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.
aı Centra	Central message is compelling (precisely stated, appropriately repeated,	Central message is clear and	Central message is basically understandable	Central message can be deduced but is not
l Messag e	memorable, and strongly supported.)	consistent with the supporting material.	but is not often repeated and is not memorable.	explicitly stated in the presentation.

Source: Association of American Colleges and Universities Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

TT

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Month North

Assoc.Prof. Nguyen Van Sin

Course Name: Software Quality Verification and Validation

Course Code: IT166IU

. General information	
1. Course designation	
Semester(s) in which the course is taught	7,9
Person responsible for the course	Tran Thanh Tung, Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours: 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.
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Object-Oriented Programming
Course objectives	Introduction to software verification, validation, and testing. Strategies and techniques are presented for testing software, and also for planning software testing.
Course learning outcomes	CLO 1. Describe and explain how testing activities involve within software development process. CLO 2. Understand and apply best practices for software testing. CLO 3. Create test cases based on system requirement
	Competency level Course learning outcome (CLO)
	Knowledge CLO1, CLO2
	Skill CLO2, CLO3
	Attitude CLO2

1. General information

Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach): U (Utilize)				
	Topic Weight Level]			
	Software3ITesting Overview0				
	Software3TTestingFoundationsT				
	Software3TTestingActivitiesImage: second sec				
	Model-Driven3T, UTest Design				
	Test3T, UAutomation				
	Testing First3TApproach				
	Criteria-Based 3 T Test Design				
	Input Space 3 T Partitioning				
	Graph 3 T Coverage				
	Logic 3 T Coverage				
	Writing Test 3 T, U Plans 7, U				
	Test3T, Uimplementation				
Examination forms	Short-answer 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	of S			
	encouraged.				

	Assignments/Examination: Students must have more than 50/100 points overall to pass this course		
	overall to pass this course.		
Reading list	 Paul Ammann, Jeff Offutt; Introduction to Software Testing, 2nd, 2017 		
	 James A. Whittaker; Exploratory Software Testing, 2009. 		
	 Glendford J. Myers, Tom Badgett, Corey Sandler; The art of Software Testing, 2012. 		

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:

	SLO					
CLO	1	2	3	4	5	6
1	XX					
2		XXX				
3						Х

Week	Торіс	CLO	Assessment s	Learning activities	Resources
1	Software Testing Overview	1	Quiz	Lecture	
2	Software Testing Foundations	1	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
3	Software Testing Activities	2	Quiz	Lecture, Discussion	[2]
4	Model- Driven Test Design	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
5	Test Automation	2,3	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]

6	Test Automation – Tools	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
7	Testing First Approach	2,3	Lab, Quiz, Midterm	Lecture, Discussion	
8	Criteria- Based Test Design	2,3	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
9	Midterm				
10	Input Space Partitioning – Part 1	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
11	Input Space Partitioning – Part 2	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,2,3]
12	Graph Coverage	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
13	Logic Coverage	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,3]
14	Writing Test Plans	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[2,3]
15	Test implementat ion	2,3	Lab, Quiz, Final	Lecture, Discussion	[2,3]
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz (5%)	Х	Х	
Labs (20%)		Х	
Midterm examination (30%)	Х	Х	X
Projects/Presentati ons/ Report (10%)		X	Х
Final examination (40%)	Х	Х	X

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

1. 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.↔

5. Rubrics (optional)

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

5.1. Grading checklist

5.2. Holistic rubric

Holis	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
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	
	critically is stated	to be considered	terms	
	clearly and	critically is	undefined.	
	described	stated.	ambiguities	
	comprehensively.	described and	unexplored.	Issue/ problem
	delivering all	clarified so that	boundaries	to be considered
	relevant	understanding is	undetermined.	critically is
Explana	information	not seriously	and/ or	stated without
tion of	necessary for full	impeded by	backgrounds	clarification or
issues	understanding.	omissions.	unknown.	description.
			Information is	
			taken from	
			source(s) with	
	Information is	Information is	some	
Evidenc	taken from	taken from	interpretation/	
e	source(s) with	source(s) with	evaluation. but	
Selecting	enough	enough	not enough to	
and	interpretation/	interpretation/	develop a	Information is
using	evaluation to	evaluation to	coherent	taken from
informati	develop a	develop a	analysis or	source(s)
on to	comprehensive	coherent	synthesis.	without any
investiga	analysis or	analysis or	Viewpoints of	interpretation/
te a	synthesis.	synthesis.	experts are	evaluation.
point of	Viewpoints of	Viewpoints of	taken as	Viewpoints of
view or	experts are	experts are	mostly fact,	experts are taken
conclusi	questioned	subject to	with little	as fact, without
on	thoroughly.	questioning.	questioning.	question.
	Thoroughly	Identifies own	Questions	Shows an
Influenc	(systematically and	and others'	some	emerging
e of	methodically)	assumptions and	assumptions.	awareness of
context	analyzes own and	several relevant	Identifies	present
and	others'	contexts when	several	assumptions

assumpt ions	assumptions and carefully evaluates the relevance of contexts when presenting a position.	presenting a position.	relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	(sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Student' s position (perspec tive, thesis/hy pothesis)	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/hypothesi s) 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.
Conclusi ons and related outcome s (implica tions and consequ ences)	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

	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	
	the body, and	and conclusion.	introduction	Organizational
	transitions) is	sequenced	and conclusion	nattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body and	material within	conclusion
	observable and	transitions) is	the body and	sequenced material
	is skillful and	clearly and	transitions) is	within the body
	makes the	consistently	intermittently	and transitions) is
	content of the	observable	observable	not observable
Organiz	presentation	within the	within the	within the
organiz	cohesive	presentation	presentation	nresentation
ation	concerve.	presentation.	I anguage	presentation.
	Language	Language	choices are	
	choices are	choices are	mundane and	
	imaginativa	thoughtful and		
	mamorable and	apparelly	and partially	Languaga choicas
	inemorable, and	generally	and partially	Language choices
	competing, and	support the	support the	are unclear and
	ennance the	effectiveness of	effectiveness of	minimally support
	effectiveness of	the	the	the effectiveness of
	the presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
-	presentation is	presentation is	presentation is	presentation is not
Languag	appropriate to	appropriate to	appropriate to	appropriate to
e	audience.	audience.	audience.	audience.
	Delivery	D 11	Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the presentation,
	speaker appears	interesting, and	and speaker	and speaker
	polished and	speaker appears	appears	appears
Deliverv	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	
	(explanations,	(explanations,	(explanations,	Insufficient
	examples,	examples,	examples,	supporting
	illustrations,	illustrations,	illustrations,	materials
	statistics,	statistics,	statistics,	(explanations,
	analogies,	analogies,	analogies,	examples,
	quotations from	quotations from	quotations from	illustrations,
	relevant	relevant	relevant	statistics,
	authorities)	authorities)	authorities)	analogies,
	make	make	make	quotations from
	appropriate	appropriate	appropriate	relevant
	reference to	reference to	reference to	authorities) make
	information or	information or	information or	reference to
	analysis that	analysis that	analysis that	information or
	significantly	generally	partially	analysis that
	supports the	supports the	supports the	minimally supports
	presentation or	presentation or	presentation or	the presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
Supporti	credibility/	credibility/	credibility/	credibility/
ng	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central message			
	is compelling			
	(precisely		Central	
	stated,	Central	message is	
	appropriately	message is	basically	Central message
	repeated,	clear and	understandable	can be deduced but
	memorable, and	consistent with	but is not often	is not explicitly
Central	strongly	the supporting	repeated and is	stated in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities Date revised: August 29th, 2023

Ho Chi Minh City, 29/08/2023 Dean of School of Computer Science and Engineering

TT

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Assoc.Prof. Nguyen Van Sinh

Course Name: Game Development

Course Code: IT167IU

Course designation	This course is an introduction to the theory and practice of the process of designing games and playful experiences.
Semester(s) in which the course is taught	7,9
Person responsible for the course	Dr. Le Duy Tan
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours. Private study including examination preparation, specified in hours: 120 hours.
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Object Oriented Programming
Course objectives	This course is an introduction to the theory and practice of the process of designing games and playful experiences. Students are familiarized with methods, concepts, techniques, and literature used in the design of games. The strategy is process-oriented, focusing on aspects such as: Rapid prototyping, play testing, and design iteration using a player-centered approach.
Course learning outcomes	CLO 1. Understand the emergence of the academic study of design methods and game design.CLO 2. Able to structure and conduct a game design project from conceptualization to playable prototype.

1. General information

	CLO 3. Solve a real-world through group collaboratio	problem using game n.	design kr	nowledge
	Competency level	Course learning o (CLO)	utcome	
	Knowledge	1		
	Skill	2, 3		
	Attitude	3		
Content	The description of the cont weighting of the content and Weight: lecture session (3) Teaching levels: I (Introdu	ents should clearly ind ad the level. hours) ce); T (Teach); U (Uti	dicate the	
	Торіс		Weigh t	Level
	Introduction to Game Dev	velopment	1	Ι
	Platforms and Publishing		3	Т
	Game Development Cycle		3	T, U
	Principles of Game Design		3	T, U
	Trade-Offs in Game Desi	gn	2	T, U
	Game Engines, Game Systems and Elements; Map and Level Editors		2	Т
	Games Marketing and Di	stribution	1	Т
Examination forms	Short-answer questions, Pr	ogramming exercises		
Study and examination requirements	Attendance: A minimum at the class sessions. Student class participation. Que encouraged. Assignments/Examination: points overall to pass this c	tendance of 80 percen s will be assessed on stions and comme Students must have r course.	t is compu the basis nts are nore than	Ilsory for s of their strongly 50/100
Reading list	4. Nystrom, Robert. G Benning, 2014.	ame programming pat	terns. Gei	never
	5. Gregory, Jason. Gar	ne engine architecture	e. crc Pres	s, 2018.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO\SL	1	2	3	4	5	6
OT						

1	Х			
2		XXX		
3				Х

Wee k	Торіс	CLO	Assessment s	Learning activities	Resour ces
1	Introduction to Game Development	1	Quiz	Lecture	1
2	Platforms and Publishing – Part 1	1	Quiz	Lecture	1
3	Platforms and Publishing – Part 2	1	Quiz	Lecture, Discussion , In-class Exercise	2
4	Platforms and Publishing – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
5	Game Development Cycle – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
6	Game Development Cycle – Part 2	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	2
7	Game Development Cycle – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
8	Principles of Game Design – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
Midte	erm		·		
9	Principles of Game Design – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
10	Principles of Game Design – Part 3	2, 3	Quiz, Lab, Final	Lecture, Discussion	1

1. Planned learning activities and teaching methods

				, In-class	
11	Trade-Offs in Game Design – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
12	Trade-Offs in Game Design – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
13	Game Engines, Game Systems and Elements; Map and Level Editors – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1, 2
14	Game Engines, Game Systems and Elements; Map and Level Editors – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
15	Games Marketing and Distribution	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
Final					

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz / Assigment (10%)	50%	10%	10%
Labs (20%)	10%	30%	30%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	10%	30%	30%

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

5. Rubrics (optional)

5.7. Grading checklist

Grading checklist for Written Reports				
Student:	HW/Assignme	ent:	•••••	• • • • • • •
Date:	Evaluator:	•••••		•••••
		Max.	Score	Comments
Technical content (6	0%)			

Abstract clearly identifies purpose and summarizes	10	
principal content		
Introduction demonstrates thorough knowledge of	15	
relevant background and prior work		
Analysis and discussion demonstrate good subject	30	
mastery		
Summary and conclusions appropriate and complete	5	
Organization (10%)		
Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
Presentation (20%)		
Correct spelling, grammar, and syntax	10	
Clear and easy to read	10	
Quality of Layout and Graphics (10%)	10	
TOTAL SCORE	100	

5.8. Holistic rubric

Holi	stic rubric for evaluating the entire document, e.g., exercises/quizzes/HW
Scor	Description
e	
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.

5.9. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
	Issue/ problem to	Issue/ problem	Issue/ problem	Issue/
	be considered	to be considered	to be	problem to
	critically is stated	critically is	considered	be
Explanation	clearly and	stated,	critically is	considered
of issues	described	described, and	stated but	critically is

	comprehensively, delivering all relevant information necessary for full understanding.	clarified so that understanding is not seriously impeded by omissions.	description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	stated without clarification or description.
Evidence Selecting and using information to investigate a point of view or conclusion	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 interpretatio n/ 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.

	Specific position			
	(perspective,			
	thesis/ hypothesis)	Specific		
	is imaginative,	position		
	taking into account	(perspective,		
	the complexities of	thesis/hypothesi		
	an issue. Limits of	s) takes into		
	position	account the		
	(perspective,	complexities of		a : a
	thesis/ hypothesis)	an issue. Others'	Specific	Specific
	are acknowledged.	points of view	position	position
	Others' points of	are	(perspective,	(perspective,
Student's	view are	acknowledged	thesis/	thesis/
position	synthesized within	within position	hypothesis)	hypothesis)
(perspective,	position	(perspective,	acknowledges	is stated, but
thesis/hypot	(perspective,	thesis/	different sides	is simplistic
hesis)	thesis/ hypothesis).	hypothesis).	of an issue.	and obvious.
		C 1 · · ·	Conclusion is	Conclusion
		Conclusion is	logically fied	1S
		logically fied to	to information	inconsistenti
	Conclusions and	a range of	(because	y tied to
	related outcomes	information,	information is	some of the
	(consequences and	including	chosen to fit	information
	implications) are	opposing	the desired	discussed;
	logical and reflect	viewpoints;	conclusion);	related
Conclusions	student's informed	related	some related	outcomes
and related	evaluation and	outcomes	outcomes	(consequenc
outcomes	ability to place	(consequences	(consequences	es and
(implication	evidence and	and	and	implications
s and	perspectives	implications)	implications)) are
consequence	aiscussed in	are identified	are identified	oversimplifi
S)	priority order.	cieariy.	clearly.	ea.

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational	Organizational	Organizational	Organizational
	pattern (specific	pattern	pattern	pattern
	introduction and	(specific	(specific	(specific
	conclusion,	introduction	introduction	introduction
	sequenced	and conclusion,	and conclusion,	and conclusion,
	material within	sequenced	sequenced	sequenced
Organizatio	the body, and	material within	material within	material within
n	transitions) is	the body, and	the body, and	the body, and
	clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	transitions) is clearly and consistently observable within the presentation.	transitions) is intermittently observable within the presentation.	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 understandabili ty of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics,	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies,

	analogies,	relevant	relevant	quotations
	quotations from	authorities)	authorities)	from relevant
	relevant	make	make	authorities)
	authorities)	appropriate	appropriate	make reference
	make	reference to	reference to	to information
	appropriate	information or	information or	or analysis that
	reference to	analysis that	analysis that	minimally
	information or	generally	partially	supports the
	analysis that	supports the	supports the	presentation or
	significantly	presentation or	presentation or	establishes the
	supports the	establishes the	establishes the	presenter's
	presentation or	presenter's	presenter's	credibility/
	establishes the	credibility/	credibility/	authority on
	presenter's	authority on the	authority on the	the topic.
	credibility/	topic.	topic.	_
	authority on the			
	topic.			
	Central message			
	is compelling			
	(precisely		Central	
	stated,	Central	message is	Central
	appropriately	message is	basically	message can be
	repeated,	clear and	understandable	deduced but is
	memorable, and	consistent with	but is not often	not explicitly
Central	strongly	the supporting	repeated and is	stated in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: August 28, 2023

Ho Chi Minh City, 28/08/2023 Dean of School of Computer Science and Engineering

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Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Blockchain

Course Code: IT150IU

1. General information

Course designation	Introduction to Blockchain technology
Semester(s) in which the course is taught	6,7
Person responsible for the course	Tran Thanh Tung, Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours: 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.
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	None
Course objectives	This subject introduces the students the foundation of blockchain technology and its applications. Students will study blockchain concepts and principles how it works. This course covers relevant topics blockchain space. The course starts with the basics of blockchain, cryptography, fundamental understanding of bitcoins. Then, the applications of blockchain technology is introduced in different areas of finance, healthcare, supply chain, etc. A complete picture of the ecosystem surrounding blockchain technology and development trends are also discussed.
Course learning outcomes	CLO 1. Understand basic contents of blockchain technology. CLO 2. Explain different types of blockchain development: Ethereum, smart contract security, bitcoin CLO 3. Apply blockchain techniques to setup the development environment to writing and deploying smart contracts, the workhorse of blockchain applications, integrating cryptocurrency micropayments into web apps

	CLO 4. Work in a team to build a blockchain application project.						
		Competency level	Course learning ou	utcome (C	CLO)		
		Knowledge	CLO1, CLO1				
		Skill	CLO3, CLO4				
		Attitude	CLO2				
Content	The weig Wei	<i>description of the co</i> <i>ghting of the content</i> ight: lecture session (description of the contents should clearly indicate the hting of the content and the level. ght: lecture session (3 hours)				
	Tea	Ton	(1000); 1 (1000); 0 (1000)	Weight	Loval		
	L	I Up			I		
			•	3			
		ryptography & crypt	ocurrencies	3			
		low Bitcoin achieve	decentralization	3	1, 1		
	N	Aechanics of Bitcoin		3	Т, U		
	H	Iow to store and use	Bitcoin	3	T, U		
	E	Bitcoin mining		3	Т		
	E	Bitcoin and Anonymit	LY	3	Т		
	E	Ethereum		3	I, T		
	S	olidity		3	T, U		
	Т	°oken		3	I, T		
	C	Dracle		3	I, T		
	Γ	Decentralized Applica	tions (Dapps)	3	T, U		
	Γ	Design pattern for blo	ckchain applications	3	Т		
	R	Real-world application	ns	3	I, T		
Examination forms	Mul	tiple-choice question	s, short-answer quest	tions			
Study and examination requirements	Atte for their enco Ass poir	endance: A minimum the class sessions. Stu r class participation. (ouraged. ignments/Examination nts overall to pass this	attendance of 80 per- adents will be assesse Questions and common: Students must hav s course.	cent is cor ad on the b ents are str e more that	npulsory asis of rongly an 50/100		
Reading list	 points overall to pass this course. [1] Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction. Princeton, 2016 [2] Andreas M. Antonopoulos, and Gavin Wood Ph. D. Mastering Ethereum: Building Smart Contracts and DApps. O'Reilly Media, 2018 [3] Xiwei Xu, Ingo Weber, and Mark Staples. Architecture for 						

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:

	SLO					
CLO	1	2	3	4	5	6
1	Х					
2	Х	Х				
3		Х				Х
4						Х

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction	1	Quiz	Teaching, Presentation	
2	Cryptography & cryptocurrencies	1	Quiz, In-class exercises	Teaching, Presentation	
3	How Bitcoin achieve decentralization	1, 2	Quiz, In-class exercises	Teaching, Presentation	
4	Mechanics of Bitcoin	1, 2	Quiz, In-class exercises	Teaching, Presentation	
5	How to store and use Bitcoin	1, 2	Quiz, In-class exercises	Teaching, Presentation	
6	Bitcoin mining	1, 2	Quiz, In-class exercises	Teaching, Presentation	
7	Bitcoin and Anonymity	2	Quiz, In-class exercises	Teaching, Presentation	
8	Midterm				
9	Ethereum	2,3	Project	Teaching, Presentation	
10	Solidity	2,3	Project	Teaching, Presentation	
11	Token	3,4	Quiz, In-class exercises	Teaching, Presentation	
12	Oracle	2,3	Quiz, In-class exercises	Teaching, Presentation Group discussion	
13	Decentralized Applications (Dapps)	3,4	Quiz, In-class exercises	Teaching, Presentation	

Week	Торіс	CLO	Assessments	Learning activities	Resources
14	Design pattern for blockchain applications	3,4	Quiz, In-class exercises	Teaching, Presentation, In-class reading	
15	Real-world applications	3,4	Presentation	Teaching, Presentation Group discussion	
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (20%)			х	Х
Midterm examination (30%)	х	х		
Final examination (40%)		х	X	
Exercises/ Quiz (10%)	Х			

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

- 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.
- 1. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports				
Student:	HW/Assignment:			
Date:				
	Evalu	lator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
Summary and conclusions appropriate and complete	5			
Organization (10%)				
Distinct introduction, body, conclusions	5			

Content clearly and logically organized, good	5	
transitions		
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

Holi	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	Milest	one	Benchmark
	4	3	2	1
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.

			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Fuidanca	comprehensive	coherent	synthesis	interpretation/
Evidence Solooting and	comprehensive		Viewneinte	avaluation
selecting and	analysis of	analysis of	v lewpoints	View einte of
	synthesis.	synthesis.	of experts are	viewpoints of
information to	viewpoints of	viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific	Specific	,	· · · · · · · · · · · · · · · · · · ·
	position	position		
	(perspective.	(perspective.		
	thesis/	thesis/hypothesi		
	hypothesis) is	s) takes into	Specific	
	imaginative.	account the	position	Specific
	taking into	complexities of	(perspective.	position
	account the	an issue. Others'	thesis/	(perspective
Student's	complexities of	points of view	hypothesis)	thesis/
nosition	an issue Limits	are	acknowledge	hypothesis) is
(nersnective.	of position	acknowledged	s different	stated, but is
thesis/hynothesi	or position	addition lougou		Statung, Out 15
	(perspective.	within position	sides of an	simplistic and

	hypothesis) are	thesis/		
	acknowledged.	hypothesis).		
	Others' points of			
	view are			
	synthesized			
	within position			
	(perspective,			
	thesis/			
	hypothesis).			
			Conclusion	
			is logically	
Conclusions			tied to	
and related		Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.

	Language			
	choices are			
	choices are		T an ave as	
	imaginative,	T		
	memorable,	Language	choices are	-
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
Lunguage	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eve contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling.	presentation	presentation	understandability
	and speaker	interesting and	understandable	of the
	annears	speaker	and speaker	presentation and
	polished and	annears	annears	speaker appears
Delivery	confident	comfortable	tentative	uncomfortable
Denvery	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations	(explanations	materials
	materials	(explanations,	examples	(avalanations
	(ovplanations	illustrations	illustrations	(explanations,
	(explainations,	inustrations,	infustitations,	illustrations
	examples,	statistics,	statistics,	inustrations,
	musuations,	analogies,	analogies,	statistics,
	statistics,	quotations	quotations	analogies,
	analogies,			quotations from
	quotations	authorities)	authorities)	relevant
	from relevant	make	make	authornes)
	aumornes)	appropriate	appropriate	to information
	inake	reference to	reference to	to information or
	appropriate	information or	information or	analysis that
	reference to analysis that a		analysis that	minimally
	information or	generally	partially	supports the
G	analysis that	supports the	supports the	presentation or
Supporting	significantly	presentation or	presentation or	establishes the
Material	supports the	establishes the	establishes the	presenter's

	presentation or establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	credibility/ authority on the topic.
	Central message is compelling (precisely stated, appropriately repeated, memorable,	Central message is clear and consistent with	Central message is basically understandable but is not often	Central message can be deduced but is not explicitly stated
Central	and strongly	the supporting	repeated and is	in the
message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Assoc.Prof. Nguyen Van Sinh

Course Name: Development and Operations (DevOps)

Course Code: IT156IU

1. General information

Course designation	This course is an introduction to DevOps to help students understand its principles and practices. Key concepts and terminology will be covered with real-life case studies, examples and practical exercises. Common and popular tools to achieve DevOps models will be introduced as well.
Semester(s) in which the course is taught	7,8
Person responsible for the course	Tran Thanh Tung, PhD.
Language	English
Relation to curriculum	Elective (NE)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	None
Course objectives	This course is an introduction to DevOps to help students understand its principles and practices. Key concepts and terminology will be covered with real-life case studies, example and practical exercises. Common and popular tools to achieve DevOps models will be introduced as well.
Course learning outcomes	CLO 1. Define and discuss the key concepts and principles of DevOps CLO 2 Explain the benefit of DevOps and continuous delivery CLO 3 Understand infrastructure automation, build and deployment automation, the transformation to DevOps models CLO 4. Work with common and popular DevOps tools

		Competency level	Course learning out	tcome (CI	.0)		
		Knowledge	1,2				
		Skill	3,4				
		Attitude	4				
Content	The description of the contents should clearly indicate the						
	wei	weighting of the content and the level.					
	We	ight: lecture session ($\frac{3}{2}$ hours)	T. •1• \			
	Tea	ching levels: I (Introc	duce); T (Teach); U (U	tilize)			
	To	pic		Weight	Level		
	Int	Introduction to DevOps 3 1					
	Int	roduction to Cloud C	Computing	3	Ι		
	Li	nux Basics and Shell	Scripting	3	T,U		
	Ve	ersioning and Build T	ool	3	Т		
	Au Co	tomation: Continuou Intinuous Deploymen	is Integration, it	3	Т		
	Co	onfiguration Manager	nent	3	I,T		
	Co	ontainers, Container v	s Virtual Machine	3	I,T		
	De	ployment pipeline		3	I,T		
	Po	st production		3	I,T		
	Di	saster recovery		3	Ι		
	Co	ntinuous Monitoring for DevOps		3	I,T		
	Int	frastructure and deplo	3	Ι			
Examination forms	Sho	rt-answer questions					
Study and	Atte	endance: A minimum	attendance of 80 perc	ent is com	pulsory		
examination	for	the class sessions. Stu	udents will be assessed	l on the ba	sis of		
requirements	the	r class participation.	Questions and comme	nts are stro	ongly		
		ouragea. ignments/Examinatic	n. Students must have	more that	n		
	50/	100 points overall to 1	pass this course.		.1		
Reading list	[1] Jeffery D.Smith, Operations Anti-Patterns, DevOps Solutions, Manning Publications 2020						
	[2] Nicole Forsgren, Accelerate: The Science of Lean Software and DevOps: Building and Scaling High Performing Technology Organizations, IT Revolution Press 2018						
	[3] Sof Aut	Jez Humble and Davi tware Releases thr omation, Addison-W	id Farley. Continuous ough Build, Test, esley Professional, 20	Delivery: and Dep 10	Reliable loyment		
	[4] Inte	Paul M. Duvall, Stev gration: Improving	ve Matyas, Andrew G Software Quality and	lover. Con d Reducir	ntinuous 1g Risk,		

Addisc	on-Wesley	Professional,	2007Len	Bass	and	John	Klein.
Deploy	ment and	Operations for	Software	Engin	ieers,	2019	

2. Learning Outcomes Matrix

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 T	1	2	3	4	5	6
1	Х					
2		XXX				
3						Х

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to DevOps				
2,3	Introduction to Cloud Computing				
4,5	Linux Basics and Shell Scripting				
6	Versioning and Build Tool				
7	Automation: Continuous Integration, Continuous Deployment				
8	Configuration Management				
Midter	·m exam				
9,10	Containers, Container vs Virtual Machine				
11	Deployment pipeline				
12	Post production				
13	Disaster recovery				
14	Continuous Monitoring for DevOps				
15	Infrastructure and deployment security				
Final e	exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
-----------------	------	------	------	------

Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%
Final examination (40%)		30%	50%	50%

5.

Rubrics (optional) 5.1. Grading checklist

Grading checklist for Written Reports				
Student:	HW/A	HW/Assignment:		
Date:	•••••			
	Evalu	lator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
Summary and conclusions appropriate and complete	5			
Organization (10%)				
Distinct introduction, body, conclusions	5			
Content clearly and logically organized, good	5			
transitions				
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

Holi	stic 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
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Evidence	comprehensive	coherent	synthesis.	interpretation/
Selecting and	analysis or	analysis or	Viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	Viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.

			Ouestions	
			some	
			assumptions	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	nresent
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		presenting a	aucis
	and others	Identifies own	May be more	assertions
	assumptions	and others!	way of	Desing to
	and calefully	and others	aware or	identify some
	relevance of	assumptions and	others	acentary sollie
Influence of	contexts when	several relevant	then anola	when
aontoxt and	contexts when	contexts when	than one s	when procenting a
context and	presenting a	presenting a	Userse)	presenting a
	Specific	position.	versa).	position.
	position			
	(perspective			
	thesis/			
	hypothesis) is			
	imaginative			
	taking into			
	against the	Specific		
	account the	specific		
	complexities of	(normonative		
	all issue. Lillins	thesis/hypothesi		
		a) takag into		
	(perspective,	s) takes into		
	hypothesis) are	account the	Specific	
	nypomesis) are	complexities of	specific	Specific
	Others' points of	all issue. Others	(porceportivo	specific
	view are	points of view	thesis/	(perspective
Student's	synthesized	acknowledged	hypothesis)	thesis/
nosition	within position	within position	acknowledge	hypothesis) is
(nersnective	(nerspective	(nerspective	s different	stated but is
thesis/hynothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue	obvious.
~)	Conclusions	Conclusion is	Conclusion	Conclusion is
	and related	logically tied to	is logically	inconsistently
	outcomes	a range of	tied to	tied to some
Conclusions	(consequences	information,	information	of the
and related	and	including	(because	information
outcomes	implications)	opposing	information	discussed;
(implications	are logical and	viewpoints;	is chosen to	related
and	reflect student's	related	fit the	outcomes
consequences)	informed	outcomes	desired	(consequence

evaluation and	(consequences	conclusion);	s and
ability to place	and	some related	implications)
evidence and	implications)	outcomes	are
perspectives	are identified	(consequence	oversimplifie
discussed in	clearly.	s and	d.
discussed in priority order.	clearly.	s and implications) are identified clearly.	

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language			
	choices are			
	imaginative,		Language	
	memorable,	Language	choices are	
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
_	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.

	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eve contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling.	presentation	presentation	understandability
	and speaker	interesting, and	understandable.	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Deliverv	confident.	comfortable.	tentative.	uncomfortable.
v	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations	quotations	quotations	statistics,
	from relevant	from relevant	from relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic.	the topic.	the topic.	topic.
	Central			
	message is		Central	
	compelling	Central	message is	Central message
	(precisely	message is	basically	can be deduced
	stated,	clear and	understandable	but is not
	appropriately	consistent with	but is not often	explicitly stated
Central	repeated,	the supporting	repeated and is	in the
Message	memorable,	material.	not memorable.	presentation.

and strongly supported.)		
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Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Wowh

Assoc.Prof. Nguyen Van Sinh

Course Name: Data Science and Visualization

1. General information				
Course designation	Introduction to Data Visu	alization		
Semester(s) in which the course is taught	4,6			
Person responsible for the course	Tran Thanh Tung, Dr.			
Language	English			
Relation to curriculum	Compulsory / elective / s programmes with which	pecialisation Names of other study the module is shared		
Teaching methods	Lecture, lesson, project, s	seminar.		
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours: 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.			
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1			
Required and recommended prerequisites for joining the course	Prerequisite course of Da	ta Science and Data Visualization		
Course objectives	The goal of this course is to introduce students to the key principles, methods, and techniques for effective visual analysis of data. The course begins with aims and key principles of data visualization. The course continues with different aspects of visualization including techniques and method for presenting different data types, and for discussing and analyzing visualizations. Thorough the course, students will be introduced to many visualization systems and visual tools via hand-on exercises.			
Course learning outcomes	CLO 1. Understand the p CLO 2. Create well-desig tools. CLO 3. Evaluate a visual	rinciples of data and graphic design. gned data visualizations with appropriate lization design.		
	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO1		
	Skill	CLO2, CLO3		
	Attitude	CLO3		

Course Code: IT138IU

Content	The description of the contents should clearly indicate the weighting of the content and the level.				
	Weight: lecture session (3 hours)				
	Topic Weight Level				
	Visualization design principles	3	I. T		
	Perception, Cognition, Color	3	T		
	Data abstraction, data types	3	I, T		
	Visual encoding with marks and channels	3	T, U		
	Tasks and Interactivity	3	Т		
	Validation and visualization	3	Т		
	Arrange text and sets	3	Т		
	Arrange spatial data	3	Т		
	Arrange tree and graphs/networks	3	Т		
	Facets and views	3	Т		
	Focus+Context	3	Т		
	Filtering and Aggregation	3	Т		
Examination forms	Multiple-choice questions, short-answer quest	tions			
Study and	Attendance: A minimum attendance of 80 percent is compulsory				
examination	for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strengly				
requirements	encouraged.				
	Assignments/Examination: Students must have more than 50/100				
	points overall to pass this course.				
Reading list	[1] Edward R. Tufte, The Visual Display of	of Quantita	ative		
	[2] Tamara Munzner Visualization Analys	sis and De	sion 1st		
	2014		51 <u>5</u> 11 150,		
	[3] Colin Ware, Visual Thinking for Desig	n 1st, 200	4		
	[4] Scott Murray, Interactive Data Visualiz	zation for	the Web		
	1st, 2013				
	[5] Alberto Cairo, The Functional Art: An introduction to information graphics and visualization 1st 2012				
	[6] Cole Nussbaumer Knaflic, Storytelling with Data: A Data				
	Visualization Guide for Business Professionals 1st, 2015				

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:

	SLO					
CLO	1	2	3	4	5	6
1	Х	Х				
2		Х	Х			
3		Х				

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Visualization design principles	1	Quiz	Teaching, presentation	
2	Perception, Cognition, Color	1,2	Quiz, Project	Teaching, presentation	
3	Data abstraction, data types	2,3	Quiz, Project	Teaching, presentation	
4	Visual encoding with marks and channels	2,3	Quiz, Project	Teaching, presentation	
5	Tasks and Interactivity	2,3	Quiz, Project	Teaching, presentation	
6	Midterm				
7	Validation and visualization	1,3	Quiz, in-class exercises, Project	Teaching, Discussion	
8	Arrange text and sets	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
9	Arrange spatial data	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
10	Arrange tree and graphs/networks	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
11	Facets and views	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
12	Focus+Context	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
13	Filtering and Aggregation	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
14	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)		х	x
Midterm examination (30%)	х	x	
Final examination (40%)		x	x
Exercises/ Quiz (10%)	X	x	

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

- 1. 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.
- 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	10				
principal content					
Introduction demonstrates thorough knowledge of	15				
relevant background and prior work					
Analysis and discussion demonstrate good subject	30				
mastery					
Summary and conclusions appropriate and complete	5				
Organization (10%)					
Distinct introduction, body, conclusions	5				
Content clearly and logically organized, good	5				
transitions					
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

Holi	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
	4 Issue/ problem to be considered critically is stated clearly	3 Issue/ problem to be considered	2 Issue/ problem to be considered critically is stated but description leaves some terms	1
Explanation of issues	and described comprehensivel y, delivering all relevant information necessary for full understanding.	critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	undefined, ambiguities unexplored, boundaries undetermined , and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence Selecting and using information to	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of	Information is taken from source(s) with some interpretation / evaluation, but not enough to develop a coherent analysis or synthesis.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are
investigate a point of view or conclusion	experts are questioned thoroughly.	experts are subject to questioning.	Viewpoints of experts are taken as	taken as fact, without question.

			mostly fact,	
			with little	
			questioning.	
	Thoroughly (systematically and methodically) analyzes own and others' assumptions and	Identifies own	Questions some assumptions. Identifies several relevant contexts when presenting a position.	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions)
	carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position	Specific position (perspective, thesis/hypothesi		
	(perspective, thesis/	s) takes into account the	Specific	
	nypotnesis) are acknowledged. Others' points of view are	an issue. Others' points of view are	position (perspective, thesis/	Specific position (perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position (nerspective	(perspective	(nerspective	s different	stated but is
thesis/hynothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.

			Conclusion is	
	Conclusions and		logically tied	
	related	Conclusion is	to	Conclusion is
	outcomes	logically tied to	information	inconsistently
	(consequences	a range of	(because	tied to some
	and	information,	information	of the
	implications)	including	is chosen to	information
	are logical and	opposing	fit the desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions and	evaluation and	outcomes	outcomes	(consequence
related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizationa			
	1 pattern			
	(specific			
	introduction	Organizationa		
	and	l pattern	Organizationa	
	conclusion,	(specific	1 pattern	
	sequenced	introduction	(specific	
	material	and	introduction	Organizational
	within the	conclusion,	and	pattern
	body, and	sequenced	conclusion,	(specific
	transitions) is	material	sequenced	introduction
	clearly and	within the	material	and conclusion,
	consistently	body, and	within the	sequenced
	observable	transitions) is	body, and	material within
	and is skillful	clearly and	transitions) is	the body, and
	and makes the	consistently	intermittently	transitions) is
	content of the	observable	observable	not observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful	mundane and	unclear and
	memorable,	and generally	commonplace	minimally
	and	support the	and partially	support the
	compelling,	effectiveness	support the	effectiveness of
	and enhance	of the	effectiveness	the
Language	the	presentation.	of the	presentation.

Oral communication value rubric for evaluating presentation tasks:

Delivery techniques (posture, gesture, eye contact, and expressivenes s) make the presentation and speaker polished and confident.Delivery techniques (posture, gesture, eye contact, and expressivenes s) make the presentation and speaker polished and appears analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, statistics, analogies, from relevant authorities)Delivery techniques (confident, comfortable.Delivery techniques (confident, 		effectiveness of the presentation. Language in presentation is appropriate to audience.	Language in presentation is appropriate to audience.	presentation. Language in presentation is appropriate to audience.	Language in presentation is not appropriate to audience.
Supporting materialsSupporting materialsSupporting materialsInsufficient(explanations, examples, illustrations, statistics, analogies, from relevant authorities)Supporting materialsInsufficient(explanations, examples, illustrations, analogies, from relevant authorities)(explanations, examples, illustrations, istatistics, analogies, inform relevant appropriate information thatSupporting materials information information 	Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressivenes s) make the presentation compelling, and speaker appears polished and confident. A variety of types of supporting	Delivery techniques (posture, gesture, eye contact, and vocal expressivenes s) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressivenes s) make the presentation understandabl e, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandabili ty of the presentation, and speaker appears uncomfortable.
Supporting authority on authority on authority on authority on the		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/	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/	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/	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/
Material the topic the topic topic	Supporting Material	authority on the topic	authority on the topic	authority on the topic	authority on the

	Central			
	message is			
	compelling		Central	
	(precisely	Central	message is	
	stated,	message is	basically	Central
	appropriately	clear and	understandabl	message can be
	repeated,	consistent	e but is not	deduced but is
	memorable,	with the	often repeated	not explicitly
	and strongly	supporting	and is not	stated in the
Central Message	supported.)	material.	memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

And Alexander

Assoc.Prof. Nguyen Van Sinh

Course Name: Critical Thinking

Course Code: PE008IU

1. General information

Course designation	This course provides the nature and techniques of thought as a basis for our claims, beliefs, and attitudes about the world. The course also explores the process in which people develop their claims and support their beliefs. Specifically, the course includes the theory and practice of presenting arguments in oral and written forms, making deductive and inductive arguments, evaluating the validity or strength of arguments, detecting fallacies in arguments, and refuting fallacious arguments. Resources for the reasoning process include hypothetical and real-life situations in various fields of natural sciences, social sciences, and humanities.
Semester(s) in which the course is taught	1, 2, 3
Person responsible for the course	Trần Thanh Tú (Ph.D) Nguyễn Thị Thủy (Ph.D) Phạm Ngọc (Ph.D) Nguyễn Văn Tiếp (Ph.D) Vũ Tiến Thịnh (MA) Đỗ Thị Diệu Ngọc (MA)
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lectures, discussions, homework assignments, students' presentations
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 135 Contact hours (lecture, exercise): 45 Private study including examination preparation, specified in hours: 90
Credit points	3
Required and recommended	None

prerequisites for joining the course							
Course objectives	his course will enable students to						
	develop the habits of assessing and defending the reasonableness of their beliefs and values as well as those of others						
	appreciate the importance of looking at an issue from a variety of perspectives						
	apply critical the	inking skills in both public and personal settings					
Course learning outcomes	Upon the succes able to:	ssful completion of this course, students will be					
	Competency level	Course learning outcome (CLO)					
	Knowledge	CLO1. Know the general concepts and standards of critical thinking; and comprehend the disadvantages of barriers to critical thinking in various contexts					
	Skill	CLO2. Know the elements of an argument and two patterns of reasoning					
		CLO3 Know the fallacies of relevance and insufficient evidence in arguments					
		CLO4. Construct and evaluate deductive and inductive arguments in spoken and written forms					
		CLO5. Test the validity of deductive arguments using Venn diagram and truth tables					
		CLO6. Analyze and standardize arguments					
		CLO7. Evaluate truth claims and refute arguments					
		CLO8. Analyze weaknesses in inductive arguments to strengthen them					
	Attitude	CLO9. Defend personal/group beliefs with good arguments and in appropriate manners (project presentations)					

Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (2 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)						
	Tonic Weight Level						
	Introduction to Critical thinking	3	L T. U				
	Recognizing arguments	3	T, U				
	Basic logical concepts	3	T, U				
	A little categorical logic	3	T, U				
	A little propositional logic	3	T, U				
	Logical fallacies I	3	T, U				
	Logical fallacies II	3	T, U				
	Review for Midterm test	3	U				
	Analyzing arguments	3	T, U				
	Evaluating arguments and truth claims	3	T, U				
	Inductive reasoning	3	T, U				
	Project: Group presentation	9	U				
	Review for Final Exam	3	U				
Examination forms	40 multiple-choice questions for the mid and group presentations for the final proj	term and ect	final exai	ns			
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. Overall passing score: 50/100						
Reading list	[1] Bassham, Irwin, Nardone, and Wallace, <i>Critical Thinking</i> <i>A Student's Introduction</i> , 6 th edition, McGraw-Hill Education 2020.						
	[2] Moore, B.N. et al. (2009). <i>Critical T</i> McGraw-Hill	hinking, 9	9th ed.				
	[3] Patrick J. Hurley (2012). <i>A Concise</i> (11 th ed.), Wadsworth, Cengage Learnin	Introducti g	ion to Log	gic			
	+ Relevant web resources						

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:

	SLO					
CLO	1	2	3	4	5	6
1						
2						
3						

3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Critical thinking	1	HW 1/Quiz 1	Lecture, Discussion, Homework, Quiz	[1] Chapter 1
2	Recognizing arguments	2	HW 2/Quiz 2	Lecture, Discussion, Homework, Quiz	[1] Chapter 2
3	Basic logical concepts	2	HW 3/Quiz 3	Lecture, Discussion, Homework, Quiz	[1] Chapter 3
4	A little categorical logic	3	HW 4/Quiz 4	Lecture, Discussion, Homework, Quiz	[1] Chapter 9
5	A little propositional logic	3	HW 5/Quiz 5	Lecture, Discussion, Homework, Quiz	[1] Chapter 10
6	Logical fallacies I	4	HW 6/Quiz 6	Lecture, Discussion, Homework, Quiz	[1] Chapter 5
7	Logical fallacies II	4	HW 7/Quiz 7	Lecture, Discussion, Homework, Quiz	[1] Chapter 6
8	Review for midterm ex	xam + s	sample test		
9 + 10	Mi	dterm	exam: Chapter	rs 1, 2, 3, 9, 10	
11	Analyzing arguments		HW 8/Quiz 8	Lecture, Discussion, Homework	[1] Chapter 7
12	Evaluating arguments and truth claims	Lating ments and truth5HW 9/Quiz 9Lecture, Discussion, Homework		Lecture, Discussion, Homework	[1] Chapter 8
13	Inductive reasoning	2	HW 10/Quiz 10	Lecture, Discussion, Homework	[1] Chapter 11

14	Project: Group presentation	6	Group work	Presentation, Discussion		
15	Project: Group presentation	6	Group work	Presentation, Discussion		
16	Project: Group presentation	6	Group work	Presentation, Discussion		
17	Review for final exam + sample test					
18	Reserved week					
19+20	Final exam: Chapters 5, 6, 7, 8, 11					

4. Assessment plan

Assessmen	CLO								
t Type	1	2	3	4	5	6	7	8	9
Class participatio n and Assignment s (30%)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass				80% Pass
Midterm exam (30%)						80% Pass	80% Pass	80% Pass	
Final exam (40%)						80% Pass	80% Pass	80% Pass	

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

5. Rubrics (optional)

Course Name: Probability, Statistics and Random Process

Course Code: MA026IU

1. General information

Course designation	The course is aimed to provide the beginning students in engineering with the simple concepts and techniques of probabilistic and statistics models and stochastic processes.					
Semester(s) in which the course is taught	1, 2, 3					
Person responsible for the course	Dr. Ta Quoc Bao Dr. Pham Hai Ha					
Language	English					
Relation to curriculum	Compulsory					
Teaching methods	Lecture, lesson, project, seminar.					
Workload (incl.	(Estimated) Total workload: 135					
contact hours, self- study hours)	Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45					
	Private study including examination preparation, specified in hours: 90					
Credit points	3					
Required and recommended prerequisites for joining the course	Calculus 1 and Calculus 2					
Course objectives	Students will be provided with skills of using data from a variety of sources, be introduced to contemporary computing and database environments, such as R/Python, and be exposed to case studies from outside the classroom. Through this unit, students will become acquainted with the challenges of contemporary data science and gain an appreciation of the foundational skills necessary to turn data into information.					

Course learning outcomes	Upon the successful completion of this course students will be able to:						
	Competency level	Course learning outcome (CLO)					
	Knowledge	CLO1. Identify basic concept such as sample space, events, probability, conditional probability, independence; distribution an mean, variance of random variables; important statistics including sample mean, sample proportion, sample variance and sample standard deviation.					
	Skill	CLO2. Compute probability of simple and complicated events with probability rules; Evaluate probability, mean and variance of random variables and function of random variables.					
		CLO3. Conduct estimate parameter(s) and hypothesis testing procedure from sample data.					
		on probability, lassify state and a Markov chain.					
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)						
	Торіс	Weight	Level				
	Introduction	1	I, T				
	Counting tech	1	T, U				
	Conditional rules	2	T, U				
	Random va expectation	4	T, U				
	Markov chain	2	T, U				
	Introduction Descriptive	1	I, T				
	Parameter es	2	T, U				
	Hypothesis te	2	T, U				
Examination forms	Written 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	 R. Walpole et al, Probability and Statistics for Engineers and Scientists, 9th edition. S. Ross, Introduction to Probability Models, 9th edition. S. Ross, Introduction Probability and Statistics for Engineers and Scientist, 3th edition 						

2. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to probability	1	Quiz1	Lecture, HW	[1].1 [2].2 [3].3
2	Counting techniques	2		Lecture, HW	[1].2
3 - 4	Calculating probability	2	Quiz2	Lecture HW	[1].2 [2].1 [3].3
5-6	Random variables	2	Quiz3	Lecture, HW	[1].3, [2].2, 3 [3].4
7	Mean – Variance – Covariance	2	HW1	Lecture, Discussion, HW	[1].4 [2].2 [3].4
8	Special distributions	2		Lecture, HW	[1].5, 6 [2].2 [3].5
9	Midterm				
10 -11	Markov chain	4	HW2	Lecture, Discussion, HW	[2].4
12	Descriptive statistics	1		Lecture, Discussion, HW	[1]. 1. [3].2
13 - 14	Parameter estimation	3	Quiz4	Lecture, Discussion, HW	[1]. 9 [3].7

15 -	Hypothesis testing	3	Quiz5	Lecture,	[1]. 10
16				Discussion,	[3]. 8
				HW	
17	Final exam				

3. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes	Qz1	Qz2, Qz3	Qz3, Qz4	
(10%)	70%Pass	70%Pass	70% Pass	
Homework exercises	HW1			HW2
(10%)	70%Pass			70%Pass
	Part I	Part II		
Midterm exam (30%)	70%Pass	70%Pass		
			Part II	Part I
Final exam (50%)			70%Pass	70%Pass

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

4. Date revised: January 12, 2022

Course Name: Chủ nghĩa xã hội khoa học (Scientific socialism) Course Code: PE017IU

1. Thông tin chung

Tên môn học (tiếng	Chủ nghĩa xã hội khoa học
Tên môn học (tiếng	Scientific socialism
Mã số môn học:	PE017IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
Số tiết lý thuyết:	30 (trên lớp)
Số tiết thực	
Số tiết tự học:	60 (về nhà)
Môn học trước:	l. Kinh tế chính trị Mác - Lênin, 2. 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. 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 vẩn 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 nghãi Mác-Leenin*, 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)

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Chuẩn	Mô tả	Tiêu chí đánh giá	Mục	Chuẩn	Mức
đầu ra			tiêu	đầu ra	độ
			môn	CDIO	giảng
			học	CTÐT	dạy
,					(I/T/U)
5.1. Kiêr	n thức		1	[
		LO.1.1 – Khái lược sự			
		ra đời CHủ nghĩa xã			
		hội khoa học, hoàn			
LO.1	NHẠP MÔN CHỦ	cánh lịch sứ và vai trò			
	NGHĨA XÃ	cua Cac Mac va	2.1	1 1 2	10
	HỘI KHOA	PH.Angghen	2.1	1.1.3	13
	HỌC	LO.I.2 – Nhận biệt			
		dược các giai doạn			
		Chủ nghĩa vĩ hội khoa			
		học thể biên qua các			
		tác nhẩm			
		$I O 1 3 - N \check{a} m r \tilde{o} d u \alpha c$			
		đối tương nhương			
		nhán và ý nghĩa của			
		viêc nghiên cứu Chủ			
		nghĩa xã hôi khoa học			
		LO.2.1- Hiểu rõ khái	2.1		
		niệm giai cấp coongn	2.1		
		hân và đặc điểm của			
		giai cấp công nhan	2.1		
	SÚ MÊNH	LO.2.2 – Nắm rõ nội	2.1		
LO.2	LICH SƯ	dung, đặc điểm sứ			
	CUA GIAI CÂP CÔNG	mệnh lịch sử của giai	2.1		
	NHÂN	cấp công nhân	2.1		
		LO.2.3 – Giải thích			
		được những điều kiện	21	1.1.3	T4
		quy định sứ mệnh lịch	2.1		
		sử của giai câp công			
		nhân			
		LO.2.4 - Phân tích	2.1		
		được những điêm	2.2		
		tương đồng và khác			
		biệt của giai cap công			
		thur high air month of	2.1		
		nục mẹn sư mẹnn của	2.2		
		giai cap cong nnan			

		. /			
		trên thê giới hiện nay			
		LO.2.5 – Năm 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 môt số giải pháp			
		chủ yếu để xây dựng			
		giai cấp công nhân			
		Viêt Nam hiên nav			
		LO.3.1 – Hiểu rõ Chủ			
	CHỦ NGHĨA	nghĩa xã hội là giai			
LO.3	XA HỌI VA	đoạn đầu của hình thái			
	IHUIKY OUÁ ĐÔ LÊN	kinh tế - xã hội công			
	CHỦ NGHĨA	sản chủ nghĩa			
	XÃ HỘI	$I \cap 3 = Trình hày$			
		được những đặc trưng	21	113	13
		cơ bản của chủ nghĩa	2.1	1.1.5	15
		vã hội			
		$I \cap 2 2$ Ciải thính			
		LU.5.5 - Gial union			
		théah guan sủa thời			
		Knach quan cua thời $1 r r r r r r r r r r r r r r r r r r $			
		ky qua do len chu			
		ngnia xa nọi và nhưng			
		dạc điệm cơ bản của			
		thời kỳ quả độ lên chu			
		nghĩa xa họi			
		LO.3.4 – Hieu ro dạc			
		trưng của thời kỳ quả			
		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.4.1 – Giải thích			
		được quan niệm về	2.1		
		dân chủ và sự ra đời và			
		phát triển dân chủ			

LO.4	DÂN CHỦ XÃ	trong lịch sử xã hội			
	HỘI CHỦ	loài người			
	NGHĨA VÀ	LO.4.2 – Nắm rõ quá			
	NHÀ NƯỚC	trình ra đời và bản chất			
	XÃ HỘI CHỦ	của nền dân chủ xã hội		1.1.3	T4
	NGHĨA	chủ nghĩa			
		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			
		LO.4.4 - hiểu được sự			
		ra đời phát triển và bản			
		chất của nền dân chủ			
		xã hội chủ nghĩa ở			
		Việt Nam			
		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			
		LO.5.1 – Trình bày			
		được khái niệm cơ cấu			
		xã hội – khái quát và			
	~	sự biên đôi của cơ câu			
	CO CAU XA	xã hội giai câp trong			
LO.5	HỌI GIAI CAP	thời kì quá độ lên chủ			
	VA LIEN	nghĩa xã hội	2.1	1.1.3	I3
	MINH GIAI	LO.5.2 – giải thích			
	CAP, TANG	được tính tất yêu của			
	LOP TRONG	liên minh giai câp,			
	THOIKY	tâng trong thời kỳ quá			
		do len chu nghĩa xã			
	CHU NGHIA Vã liệi				
	λΑ ΗΨΙ	LU.5.5 - Hieu ro co			
		cau xa nọi – giai cap ơ			
		việt inam trong thời Ki			
		qua uọ và trình bày			
		nnung giai phap co			

		bản nhằm xây dựng.			
		phát triển lối liên minh			
		giại cấn tầng lớn xã			
		hội ở Việt Nam			
		nội ở việt Nam			
		?			
		LO.6.1 – Hiêu rõ khái	2.1		
		niệm, đặc trưng cơ bản			
		của dân tộc và quan			
		điểm của chú nghĩa			
	VÂN ĐỀ DÂN	Mác – Leenin về vấn			
	TỘC VÀ TÔN	đề dân tộc	2.1		
	GIÁO TRONG	LO.6.2 – Trình bày			
LO.6	THỜI KÌ	được những đặc điểm			
	OUÁ ĐÔ LÊN	cơ bản của dân tộc ở			
	CHĽ NGHĨA	Việt Nam và quan			
		điểm chính sách dân	2.1		
	MIIQI	tôc của Đảnh và Nhà	2.1		
		nyrée Viêt Nam		1 1 2	т1
				1.1.3	14
		LO.6.3 - Hieu dược			
		bản chất, nguồn gốc,			
		tính chất của tôn giáo			
		và nguyên tăc cơ bản	2.1		
		giải quyết vấn đề tôn	2.2		
		giáo trong thời kỳ quá			
		độ lên chủ nghĩa xã			
		hội	2.1		
			2.2		
		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			
		nguong ton giao men			
		пау			
		IO(5 U ² ~ 4			
		LO.0.3 - Hieu ro dược			
		dạc điệm quan hệ dân			
		tọc và tồn giáo ở Việt			
		Nam và trình bày được			
		các định hướng cơ bản			
		nhăm giải quyết mối			
		quan hệ giữa dân tộc			

r					
		và tôn giáo ở Việt			
		Nam hiện nay			
		LO.7.1 – Khái lược			
		được vị trí, chức năng			
		và vại trò của gia đình			
	VÂN ĐỀ CIA	trong võ hội			
			-		
107		LO./.2 – Nnạn biệt	2.1	1 1 2	10
LO./	THUIKY	dược các cơ sơ xay	2.1	1.1.3	13
	QUA ĐỌ LEN	dựng gia đình trong			
	CHU NGHIA	thời kỳ quá độ lên chủ			
	XA HỌI	nghĩa xã hội	-		
		LO.7.3 – Giải thích			
		được sự biến đổi của			
		gia đình Việt Nam			
		trong thời kỳ quá đội			
		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 vã hội			
5) V.		ligina xa nọi			
3.2. Ny I	ung				
		LO.8.1 – Có kỹ năng		2.1.1	
		khái quát hóa để rút ra		2.1.1	
		Từ khóa trí thức đối		2.3.1	
	THỂ HIÊN	với mỗi nội dụng và tự			
	KHẢ NĂNG	duy vó hệ thống	21	2.4.4	114
1.0.8	KHÁLOUÁT	IO82 - Có kỹ nặng	2.1		01
20.0	ΗΟΑ ΤΙΙ	trình bày thuyết minh	2.2		
	DUV TRANG	nhản biên tranh luận			
	\mathbf{U}	bùng biên những trị		2.5	
	DIÊN I ÀM	thức lý luôn đang hao		3.1.5	
	DILIN, LAIVI	thuc ly luận dang nộc			
		tạp, nghiên cửu dựa			
		tren thực tien			
		LO.8.3 – Có kỹ năng			
		giao tiêp xã hội, hợp			
		tác và làm việc nhóm,			
		chia sẻ tri thức và kinh			
		nghiệm, khả năng điều			

		hành nhóm làm việc			
		LO.9.1 - Co y thức			
	/	trách nhiệm bảo vệ			
	THỂ HIỆN Y	tính khoa học, cách			
	THỨC NHẬN	mạng trong lý luận của			
LO.9	THỨC	chủ nghĩa Mác –	2.1	3.1	U3
	TRONG VÀ	Leenin về CNXH và	2.2		
	SAU KHI	con đường đi lên			
	HỌC TẬP	CNXH ở Việt Nam			
		LO.9.2 – Có ý thức,			
		trách nhiệm cá nhân			
		đối với tập thể, cộng			
		đồng			
		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 (tiất)	Nội dung giảng day	LO	Hoạt động dạy và học	Đánh giá
(uer)	uạy		-	gia
1 (tiết 1)	Giới thiệu về môn học	LO.1 LO.4	 Dạy: Giới thiệu đề cương môn học Giới thiệu nội dung đề tài thuyết trình nhóm (GHW) Học ở lớp: Chia nhóm (5 SV/nhóm) Giới thiệu nhóm học tập Học ngoài lớp: Chọn đề tài thuyết trình của nhóm (GHW) Đọc trước tài liệu chương 1. 	
			Dạy: 1.S. P. RA ĐỜI CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌC 1.1. Hoàn cảnh lịch sử sự ra đời của chủ nghĩa xã hội khoa học 1.2. Vai trò của C. Mác và Ăngghen	

Chương 1 NHẬP MÔNTRIỀN CƠ BẢN CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌCThi2CHỦ NGHĨA XÃ HỘI KHOA HỌCC. Mác và Ph.Ăngghen phát triển chủ nghĩa xã hội khoa học 2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới 2.2. Chủ nghĩa xã hội(Quiz triển sáng tạo chủ nghĩa xã hội thoa học triển sáng tạo chủ nghĩa xã hội thoa học	cì
Chương 1 NHẬP MÔNNGHĨA XÃ HỘI KHOA HỌC 2.1. C. Mác và Ph.Ăngghen phát triển chủ nghĩa xã hội khoa học 2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới 2.2. Qui the same same same same same same same sam	cì
2Chương I NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỘCNGHIA XA HỘI KHOA HỘC 2.1. C. Mác và Ph.Ăngghen phát triển chủ nghĩa xã hội khoa học 2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới 2.2. QuizIni giữa l (Quiz	cì
2NHẠP MON CHỦ NGHĨA XÃ HỘI KHOA HỌC2.1. C. Mác và Ph.Angghen phát triển chủ nghĩa xã hội khoa học 2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới 2.2. Quiz(Quiz (Quiz	(Ì
2CHU NGHIA XÃ HỘI KHOA HỌCtriên chủ nghĩa xã hội khoa học 2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới(Quiz	
XÃ HỘI KHOA HỌC2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới)
HỌC triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới	
khoa học trong điều kiện mới	
2.3. Sự vận dụng và phát triển sáng	
tạo chủ nghĩa xã hội khoa học từ	
sau khi lênin que đời đến nay	
$2 \hat{D} \hat{D} \hat{I} \hat{I} \hat{I} \hat{O} \hat{I} \hat{I} \hat{O} \hat{I} \hat{I} \hat{O} \hat{I} \hat{I} \hat{I} \hat{O} \hat{I} \hat{I} \hat{O} \hat{I} \hat{I} \hat{O} \hat{I} \hat{I} \hat{I} \hat{O} \hat{I} \hat{I} \hat{I} \hat{I} \hat{I} \hat{I} \hat{I} I$	
3.001100NG, PHUONG PHAP	
VA Y NGHIA CUA VIỆC	
NGHIEN CUU CHU NGHIA XA	
HỌI KHOA HỌC	
3.1. Đôi tượng nghiên cứu của chủ	
nghĩa xã hội khoa học	
3.2. Phương pháp nghiên cứu của	
chủ nghĩa xã hôi khoa học	
Ý nghĩa của việc nghiên cứu chủ	
nghĩa xã hội khoa học	
Học ở lớn: Thảo luận và nhát hiểu	
trên lớn	
$\mathbf{D}_{\mathbf{r}} \left\{ \mathbf{r} \in \mathcal{A}_{\mathbf{r}}^{\mathbf{r}} : \mathbf{r} \in \mathcal{A}_{\mathbf{r}}^{\mathbf{r}} \right\}$	
- Phac thao noi dung thuyet trinn	
nhom GHW	
- Đọc trước tài liệu chương 2.	
Dạy:	
Chương 2 1.QUAN ĐIÊM CƠ BẢN CỦA	
SỨ MỆNH LỊCH LO.2 CHỦ NGHĨA MÁC - LEENIN VỀ Thi	
3 SỬ CỦA GIAI LO.4 GIAI CÁP CÔNG NHÂN VÀ SỨ giữa 1	cỳ
CÂP CÔNG LO.5 MÊNH LICH SỬ THẾ GIỚI CỦA (Quiz)
NHÂN GIẠI CẮP CÔNG NHÂN	/
1.1 Khái niệm và đặc điểm của	
giại cấn công nhận	
1.2 Nội dụng và đặc điẩm sứ mậnh	
lich sử sủa giai cấn câng nhận	
1.2. Nhông điền cáp công linan	
1.3. Nhưng điều kiện quy định sư	
menn lịch sử của giai cap công	
nhân	
2.GIAI CAP CONG NHAN VA	
VIỆC THỰC HIỆN SƯ MỆNH	
LỊCH SƯ CỦA GIA1 CÂP CÔNG	
NHÂN HIỆN NAY	
2.1. Giai cấp công nhân hiện nay	
2.2. Thực hiện sứ mệnh lịch sử của	
giai cấp công nhân trên thế giới	

			 3.SÚ MỆNH LỊCH SỬ CÙA GIAI CÂP CÔNG NHÂN VIỆT NAM 3.1. Đặc điểm của giai cấp công nhân Việt Nam 3.2. Nội dung sứ mệnh lịch sử của giai cấp công nhân Việt Nam hiện nay 3.3. Phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Đọc trước tài liệu chương 3 	
4	Chương 3 CHỦ NGHĨA XÃ HỘI VÀ THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.3 LO.4 LO.5	 Dạy: 1. CHỦ NGHĨA XÃ HỘI 1.1. Chủ nghĩa xã hội, giai đoạn đầu của hình thái kinh tế - xã hội công sản chủ nghĩa 1.2. Điều kiện ra dời chủ nghĩa xã hội 1.3. Những đặt trưng cơ bản của chủ nghĩa xã hội 2. THỜI KỶ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI 2.1. Tính tất yếu khách quan của thời kỳ quá độ lên chủ nghĩa xã hội 2. Đặc điểm của thời kỳ quá độ lên chủ nghĩa xã hội 3. QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM 3.1. Quá độ lên chủ nghĩa xã hội bỏ qua chế độ tư bản chủ nghĩa xã hội bỏ qua chế độ tư bản chủ nghĩa xã hội bỏ qua chế độ tư bản chủ nghĩa xã hội và phương hướng xây dựng chủ nghĩa xã hội ở Việt Nam hiện nay Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: Đọc trước tài liệu chương 4 	Thuyết trình nhóm (GHW) Thi giữa kỳ (Quiz)
5	Chương 4 DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA	LO.2 LO.4 LO.5	Dạy: 1. DÂN CHỦ VÀ DÂN CHỦ XÃ HỘI CHỦ NGHĨA 1.1. Dân chủ và sự ra đời, phát triển của dân chủ 1.2. Dân chủ xã hội chủ nghĩa	Thuyết trình nhóm (GHW)

			 NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA Sự ra đời, bản chất, chức năng của nhà nước xã hội chủ nghĩa Mối quan hệ giữa dân chủ xã hội chủ nghĩa và nhà nước xã hội chủ nghĩa DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC PHÁP QUYỀN XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM 	Thi cuối kỳ (FEX)
			Việt Nam 3.2. Nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam hiện nay	
			 3.3. Phát huy dân chủ xã hội chủ nghĩa, xây dựng nhà nước pháp quyền xã hội chủ nghĩa ở Việt Nam Học ở lớp: Thảo luận và phát biểu Học ngoài lớp: 	
			Đọc trước tài liệu chương 5 trên lớp	
6	Chương 5 CƠ CÂU XÃ HỘI – GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.3 LO.4 LO.5	 Dạy: 1. CƠ CÂU XÃ HỘI GIAI CẤP TRONG THỜI KY QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI 1.1. Khái niệm và vị trí của cơ cấu xã hội - giai cấp trong cơ cấu xã hội 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 2. LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KY QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI 3. CƠ CÂU XÃ HỘI - GIAI CẤP, VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KY QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM 3.1. Cơ cấu xã hội - giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam 3.2. Liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam Học ở lớp: Thảo luận và phát biểu trên lớp 	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)

			Đọc trước tài liệu chương 6	
7	Chương 6 VÂN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.2 LO.4 LO.5	 Dạy: 1. DÂN TỘC TRONG THỜI Kỵ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI 1.1. Chủ nghĩa Mác - Lênin về dân tộc 1.2. Dân tộc và quan hệ dân tộc ở Việt Nam 2. TÔN GIÁO TRONG THỜI Kỵ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI 2.1. Chủ nghĩa Mác - Lênin về tôn giáo 2.2. Tôn giáo ở Việt Nam và chính sách tôn giáo của Đảng, Nhà nước ta hiện nay 3. QUAN HỆ DÂN TỘC VÀ TÔN GIÁO ở VIỆT NAM 3.1. Đặc điểm quan hệ dân tộc và tôn giáo ở Việt Nam 3.2. Định hướng giải quyết mối quan hệ dân tộc và tôn giáo ở Việt Nam 3.3. Phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay Học ở lớp: Thảo luận và phát biểu trên lớp Học ngoài lớp: 	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
			Dạy:	
8	Chương 7 VÂN ĐỀ GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HÔI		 KHÁI NIỆM, VỊ TRÍ VÀ CHỨC NĂNG CỦA GIA ĐÌNH 1.1. Khái niệm gia đình 1.2. Vị trí của gia đình trong xã hội 1.3. Chức năng cơ bản của gia đình 2.CƠ SỞ XÂY DỰNG GIA ĐÌNH TRONG THỜI KỲ 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 	Thuyết trình nhóm (GHW)

		3.XÂY DỰNG GIA ĐÌNH VIỆT	Thi
		NAM TRONG THỜI KỲ QUÁ	cuối kỳ
		ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	(FEX)
		3.1. Sự biển 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 đô lên chủ	
		nghĩa xã hôi	
		Học ở lớp: Thảo luân và phát biểu	
		trên lớp	
		Học ngoài lớp:	
		Hoàn thiên bài thuyết trình	
		. ,	

7. Đánh giá môn học

S T 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
2	Quiz	Bài thi	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 (Discussi on 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	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%		<u>L0.</u>

8. Tiêu chí đánh giá chuẩn đầu ra môn học

ТТ	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, biếu 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 Ngân hàng đề thi của
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 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 dề 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	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: <u>daotao.spas@vnuhcm.edu.vn</u>

- 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 họ

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Course Name: Principles of Programming Languages

Course Code: IT092

	11101	11				
Course designation	Th	is course provides stu	dents the important principles of			
	pro	gramming languages	•			
Semester(s) in which	6					
the course is taught						
Person responsible	Dr.	Ha Viet Uyen Synh				
for the course						
Language	Eng	glish				
Relation to	Co	mpulsory (CS)				
curriculum						
Teaching methods	Lee	cture, lesson, project,	seminar.			
Workload (incl.	To	tal workload: 195				
contact hours, self-	Contact hours: 45 (lecture) + 30 (laboratory)					
study hours)	Private study including examination preparation, specified in					
,	hours: 120					
Credit points	Nu	mber of credits : 4				
-	Lee	cture: 3				
	Lal	boratory: 1				
Required and						
recommended						
prerequisites for						
joining the course						
Course objectives	Th	is course helps studer	ts: Learn important principles of			
	pro	gramming languages	; Learn basic components of			
	pro	gramming languages	; Learn programming language			
	par	adigms; Improve pro	gramming and software engineering			
	ski	lls				
Course learning	CL	O 1. Understand a wi	de range of programming paradigms			
outcomes	CL	O 2. Understand how	v different programming languages			
	evo	olved				
	CL	O 3. Understand the	differences in problem domains and			
	lan	guage suitability				
	CL	O 4. Understand the	basic features of programming			
	language translation					
	CLO 5. Understand implementation techniques for selected					
	language constructs					
		Competency level	Course learning outcome (CLO)			
		Knowledge	1,2,3,4,5			
		Skill	2			

1. General information

	Attitude					
Content	The description of the conversion of the conversion of the content Weight: lecture session Teaching levels: I (Intro	ontents should clearly t and the level. (3 hours) oduce); T (Teach); U (v indicate t Utilize)	he		
	Торіс		Weight	Level		
	Preliminaries		3	I,T		
	Evolution of the Major Languages	Programmin	6	I,T		
	Functional Programmi	6	I,T			
	Software processes De Semantics	scribing Syntax and	3	I,T		
	Lexical and Syntax An	alytics	3	I,T		
	Names, Bindings, Typ Scopes	3	I,T			
	Data Types		3	I,T		
	Expressions and Assig	nment Statement	3	I,T		
	Logic Programming La	anguages	6	I,T		
	Statement-Level Contr	ol Structures	3	I,T		
	Subprograms	3	I,T			
	Implement Subprogram	3	I,T			
Examination forms	Multiple-choice questions, short-answer 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. Robert W. Sebesta, Concepts of programming languages 10th, 2012					
	2. Terrence W.Pratt Programming Lan 4th, 2011	and Marvin V. Zelkov Iguages - Design and I	vitz, Implement	ation		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-5) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	x					
2		Х				
3	х					
4	X					
5	Х					

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Preliminaries	1	Quiz,	lecture, exercises	
2	Evolution of the Major Programming Languages	2,3	Quiz,	lecture, exercises	
3	Functional Programming Languages	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
4	Software processes Describing Syntax and Semantics	3,4,5	Quiz, Exam	lecture, exercises	
5	Lexical and Syntax Analytics	4,5	Quiz, Exam	lecture, exercises	
6	Midterm				
7	Names, Bindings, Type Checking, and Scopes	4,5	Quiz, Exam	lecture, exercises	
8	Data Types	4,5	Quiz, Exam	lecture, exercises	
9	Expressions and Assignment Statement	4,5	Quiz, Exam	lecture, exercises	
10	Logic Programming Languages	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
11	Statement-Level Control Structures	4,5	Quiz, Exam	lecture, exercises	
12	Subprograms	4,5	Quiz, Exam	lecture, exercises	
13	Implement Subprograms	4,5	Quiz, Exam	lecture, exercises	
14	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Midterm examination (30%)	50%	50%	50%		
Final examination (40%)				50%	50%

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Exercises/ Quiz (10%)	20%	20%	20%	20%	20%
Lab. Assignments (20%)	30%	30%	30%	30%	30%

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/A	Assignme	ent:		
Date:					
	Evalu	lator:			
	Max.	Score	Comments		
Technical content (60%)					
Abstract clearly identifies purpose and summarizes	10				
principal content					
Introduction demonstrates thorough knowledge of	15				
relevant background and prior work					
Analysis and discussion demonstrate good subject	30				
mastery					
Summary and conclusions appropriate and complete	5				
Organization (10%)					
Distinct introduction, body, conclusions	5				
Content clearly and logically organized, good	5				
transitions					
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

Holi	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.

	Capstone	Milest	one	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 Selecting and using information to investigate a point of view or conclusion	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	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	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions).

5.3. Analytic rubric *Critical thinking value rubric for evaluating questions in exams:*

	relevance of		be more	Begins to
	contexts when		aware of	identify some
	presenting a		others'	contexts when
	position.		assumptions	presenting a
	-		than one's	position.
			own (or vice	-
			versa).	
	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position	Specific position (perspective, thesis/hypothesis)		
	(perspective,	takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Sussifie	Sussifie
	Others' points of	an issue. Others	specific	specific
	view are	points of view	(perspective	(perspective
	synthesized	acknowledged	thesis/	thesis/
Student's	within position	within position	hypothesis)	hypothesis) is
nosition	(nerspective	(perspective	acknowledges	stated but is
(nersnective	thesis/	thesis/	different sides	simplistic and
(perspective, thesis/hynothesis)	hypothesis)	hypothesis)	of an issue	obvious
		nypotneois).	Conclusion is	0011045.
			logically tied	
	Conclusions and		to information	Conclusion is
	related outcomes	Conclusion is	(because	inconsistently
	(consequences	logically tied to a	information is	tied to some of
	and implications)	range of	chosen to fit	the
	are logical and	information,	the desired	information
	reflect student's	including	conclusion);	discussed;
	informed	opposing	some related	related
	evaluation and	viewpoints;	outcomes	outcomes
	ability to place	related outcomes	(consequences	(consequences
Conclusions and	evidence and	(consequences	and	and
related outcomes	perspectives	and implications)	implications)	implications)
(implications and	discussed in	are identified	are identified	are
consequences)	priority order.	clearly.	clearly.	oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

Capstone	Milestone		Benchmark
4	3	2	1

	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body and	and conclusion	introduction	nattern (specific
	the body, and	and conclusion,	and conclusion	introduction and
		sequenceu		
	clearly and	material within	sequencea	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the consistently		intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language			
	choices are			
	imaginative.		Language	
	memorable	Language	choices are	
	and	choices are	mundane and	Language
	compelling	thoughtful and	commonnlace	choices are
	and anhanaa	anorally	and nortially	unaleer and
		generally		
	the	support the	support the	minimally
	effectiveness of	effectiveness of	effectiveness of	support the
	the	the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
	Delivery			
	techniques		Delivery	
	(posture,	Delivery	techniques	Delivery
	gesture, eye	techniques	(posture,	techniques
	contact, and	(posture.	gesture, eve	(posture, gesture,
	vocal	gesture, eve	contact, and	eve contact, and
	expressiveness)	contact and	vocal	vocal
	make the	vocal	evpressiveness)	expressiveness)
	nrecentation	evnressiveness	make the	detract from the
		males the	make the	uculati nom me
	compening,	make the	presentation	
	and speaker	presentation	understandable,	or the
	appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations from	quotations from	quotations from	statistics,
	relevant	relevant	relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
~	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central .			
	message is			
	compelling			
	(precisely		Central .	
	stated,	Central .	message 1s	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable,	consistent with	but is not often	explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

A Science

Assoc.Prof. Nguyen Van Sinh

Course Name: Data Mining

Course Code: IT160IU

1. General information

Course designation	This subject intro- algorithms of data mining process.	duces the students to the principles and a mining, and the requirements of a data		
Semester(s) in which the course is taught	6,8			
Person responsible for the course	Dr. Nguyen Thi T	'hanh Sang		
Language	English			
Relation to curriculum	Elective (CS, NE, Compulsory (DS)	, CE)		
Teaching methods	Lecture, lesson, p	roject, laboratory.		
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120			
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1			
Required and recommended prerequisites for joining the course	Object-Oriented Programming			
Course objectives	Students will study data mining concepts and algorithms to solve problems of knowledge discovery. They will be equipped with skills of using recent data mining software for solving practical problems and gain experience of doing independent study and research			
Course learning				
outcomes	Competency level	Course learning outcome (CLO)		
	Knowledge	CLO 1. Understand basic contents of data warehousing and data mining. CLO 2. Explain modern algorithms in the area of data mining and knowledge discovery.		
	Skill	CLO 3. Apply data mining techniques to some case studies using existing datasets.		

	Attitude	CLO 4. Work in a team to b mining process.	ouild a dat	a
Content	The description of weighting of the c Weight: lecture se Teaching levels: I	<i>f the contents should clearly</i> <i>content and the level.</i> ession (3 hours) ((Introduce); T (Teach); U (U	<i>indicate th</i> Jtilize)	ee
	Торіс		Weight	Level
	Introduction to I	Data Mining	1	Ι
	Know your data		1	T, U
	Data preprocessi	1	T, U	
	Data mining kno	1	T, U	
	Evaluating what	1	Т	
	Data mining algo	2	T, U	
	Mining Frequent Correlations: Ba	2	Т	
	Data mining algo	2	Т	
	Classification: A	dvanced Methods	1	T, I
	Semantic data m	ining	1	Ι
Examination forms	Multiple-choice q	uestions, short-answer questi	ions	
Study and examination requirements	Attendance: A mi for the class sessi- their class particip encouraged. Assignments/Exa 50/100 points over	nimum attendance of 80 percons. Students will be assessed bation. Questions and comme mination: Students must have arall to pass this course.	cent is con d on the ba ents are str e more tha	npulsory asis of ongly n
Reading list	 [1] Jiawei Han, M. <i>Techniques</i>, 3rd E. [2] Ian H.Witten, Pal, <i>Data Mining</i>. <i>Techniques</i>, Fourt [3] A. Lawrynow: based Approach ((April 15, 2017). 	licheline Kamber, <i>Data Mini</i> dition, 2011. Eibe Frank, Mark A. Hall, an <i>Practical Machine Learning</i> th Edition, Morgan Kaufman icz, <i>Semantic Data Mining: A</i> <i>Studies on the Semantic Web</i> ISBN-10 1614997454	ng: Conce nd Christo g Tools an n, 2016. An Ontolog), IOS Pre	pts and pher J. d gy- ss

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

			SI	Ο		
CLO	1	2	3	4	5	6
1	X					

2	X			
3				X
4			X	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to Data Mining	1		Lecture, Discussion	[1, 2]. Chapter 1
2	Know your data	1	Quiz.s2	Lecture, In-class quiz	[1]. Chapter 2
3	Data preprocessing	1,4		Lecture, Discussion	[1]. Chapter 3
4	Data mining knowledge representation	1	Quiz.s4	Lecture, In-class quiz	[2]. Chapter 3; Reading [1]. Chapter 4 – Data Warehousing
5	Evaluating what's been learned	1	Quiz.s5	Lecture, In-class quiz	[2]. Chapter 5
6-7	Data mining algorithms: Classification	2,3	Quiz.s6-7	Lecture, In-class quiz	[1]. Chapter 8; [2]. Chapter 4.3
8	Data mining to code	3		Lecture, Discussion	
9	Midterm				
10-11	Mining Frequent Patterns, Association and Correlations: Basic Concept and Methods	2,3,4	Quiz.s10-11	Lecture, In-class quiz	[1]. Chapter 6; [2]. Chapter 4.5
12-13	Data mining algorithms: Clustering	2,3,4	Quiz.s12-13	Lecture, In-class quiz	[1]. Chapter 10; [2]. Chapter 4.8
14	Classification: Advanced Methods	2	Quiz.s14	Lecture, In-class quiz	[1]. Chapter 9
15	Semantic data mining	2		Lecture, Discussion	[3]
16	Revision			Review- test	
17	Final exam				

Laboratory	
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Week	Lab
5	Introduction to Weka
6	Evaluation
7	Simple classifiers
8	Programming - Pre-processing data
9	More classifiers
10	Putting it all together
11	Programming - Clustering
12	Programming - Sequential pattern discovery

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (10%)			100%	
Programming (20%)			70%	30%
Midterm examination (30%)	50%	50%		
Final examination (40%)		40%	60%	

5. Rubrics (optional) 5.1. Grading checklist

Grading checklist for Written Reports						
Student:	HW/Assignment:					
Date:	•••••		••			
	Evalu	ator:				
	Max.	Score	Comments			
Technical content (60%)						
Abstract clearly identifies purpose and summarizes	10					
principal content						
Introduction demonstrates thorough knowledge of	15					
relevant background and prior work						
Analysis and discussion demonstrate good subject	30					
mastery						
Summary and conclusions appropriate and complete	5					
Organization (10%)						
Distinct introduction, body, conclusions	5					
Content clearly and logically organized, good	5					
transitions						
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

Holi	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

	Capstone	Milest	one	Benchmark
	4	3	2	1
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information	
	taken from	taken from	is taken from	Information is
	source(s) with	source(s) with	source(s)	taken from
Evidence	enough	enough	with some	source(s)
Selecting and	interpretation/	interpretation/	interpretation	without any
using	evaluation to	evaluation to	/ evaluation,	interpretation/
information to	develop a	develop a	but not	evaluation.
investigate a	comprehensive	coherent	enough to	Viewpoints of
point of view or	analysis or	analysis or	develop a	experts are
conclusion	synthesis.	synthesis.	coherent	taken as fact,

Critical thinking value rubric for evaluating questions in exams:

	Viewpoints of	Viewpoints of	analysis or	without
	experts are	experts are	synthesis.	question.
	questioned	subject to	Viewpoints	1
	thoroughly.	questioning.	of experts are	
		1 0	taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific			
	position			
	(perspective,			
	tnesis/			
	imaginativa			
	taking into			
	account the	Specific		
	complexities of	nosition		
	an issue. Limits	(nerspective		
	of position	thesis/hypothesi		
	(perspective.	s) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.

		1	1	
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Digital Image Processing

Course Code: IT130IU

1. General information

Course designation	This	This course provides students fundamental knowledge of digital					
Semester(s) in which the course is taught	7	7					
Person responsible for the course	Dr.	Dr. Ha Viet Uyen Synh					
Language	Eng	English					
Relation to curriculum	Elec	etive (All programs)					
Teaching methods	Lect	ture, lesson, project, s	seminar.				
Workload (incl.	Tota	ıl workload: 195					
contact hours, self-	Con	tact hours: 45 (lectur	e) + 30 (laboratory)				
study hours)	hou	rs: 120	xamination preparation, specified in				
Credit points	Nun	nber of credits : 4					
	Lect	ture: 3					
-	Lab	oratory: 1					
Required and							
prerequisites for							
joining the course							
Course objectives	This	s course helps student	s discuss digital image processing				
	func	lamentals; review of	Digital Signal Processing algorithms				
	such	as Discrete Fourier	Transform; intensity transforms,				
	freq	uency domain filterin	ng; image restoration and reconstruction;				
	colo	r image processing; 1	nultiresolution processing; image				
	com	pression; morpholog	ical image processing.				
Course learning		1. Understand bases	s of digital image formation.				
outcomes) 2. Understand the c	olor image foundations.				
	CLC	Competency level	Course learning outcome (CLO)				
		Knowledge					
		CI 11	2				
		SKIII	5				
		Attitude					
Content	The	description of the con	ntents should clearly indicate the				
	weig Weig	gnung of the content of abt: lecture session (ana me level. 2 hours)				
	Tea	ching levels. I (Introd	buce): T (Teach): U (Utilize)				
	reaching levels: I (Introduce); I (Teach); U (Utilize)						

	Торіс	Weight	Level
	Chapter 1: Introduction	3	I, T
	Chapter 2: Digital Image Fundamentals	6	I, T
	Chapter 3: Intensity Transformations and Spatial Filtering (part 1)	3	T, U
	Chapter 3: Intensity Transformations and Spatial Filtering (part 2)	6	T, U
	Chapter 4: Filtering in the frequency domain	6	T, U
	Chapter 5: Image restoration and reconstruction	3	T, U
	Chapter 6: Color Image processing	3	T, U
	Chapter 7: Wavelets and multiresolution processing (part 1)	3	T, U
	Chapter 7: Wavelets and multiresolution processing (part 2)	3	T, U
	Chapter 8: Image compression	3	T, U
	Chapter 9: Morphological image processing	3	T, U
	Chapter 10: Image segmentation	3	T, U
	Chapter 11: Representation and description	3	T, U
	Chapter 12: Object recognition	3	T, U
	Revision Application Design and Development	3	
Examination forms	Multiple-choice questions, short-answer question	ons	
Study and	Attendance: A minimum attendance of 80 perce	ent is com	pulsory
examination	for the class sessions. Students will be assessed	on the bas	sis of
requirements	encouraged.	its are stro	ngly
	Assignments/Examination: Students must have	more than	ı 50/100
	points overall to pass this course.		
Reading list	1. Rafael C. Gonzalez, Richard E. Woods, D Processing 3rd, 2008	Digital Ima	ge

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х	X				
2	Х	X				
3						X

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Chapter 1: Introduction	1,2	Quiz, Lab, Exam	lecture, exercises	
2	Chapter 2: Digital Image Fundamentals	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
3	Chapter 3: Intensity Transformations and Spatial Filtering (part 1)	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	
4	Chapter 3: Intensity Transformations and Spatial Filtering (part 2)	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	
5	Chapter 4: Filtering in the frequency domain	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
6	Chapter 5: Image restoration and reconstruction	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
7	Chapter 6: Color Image processing	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
8	Midterm				
9	Chapter 7: Wavelets and multiresolution processing (part 1)	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
10	Chapter 7: Wavelets and multiresolution processing (part 2)	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
11	Chapter 8: Image compression	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
12	Chapter 9: Morphological image processing	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
13	Chapter 10: Image segmentation	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
14	Chapter 11: Representation and description	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
15	Chapter 12: Object recognition	2,3	Quiz, Lab, Exam	lecture, exercises, lab	

3. Planned learning activities and teaching methods

16	Revision Application Design and Development	1,2,3		
17	Final exam			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)	20%	20%	20%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	40%	40%	40%
Exercises/ Quiz (10%)	10%	10%	10%

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

5. Rubrics (optional)

5. Rubrics (optional)				
5.1. Grading checklist				
Grading checklist for Written	Repor	ts		
Student:	HW/Assignment:			
Date:				
	Eval	uator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
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			

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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
			Issue/ problem	
		Issue/	to be considered	
		problem to be	critically is	
	Issue/ problem to	considered	stated but	
	be considered	critically is	description	
	critically is stated	stated,	leaves some	
	clearly and	described,	terms undefined,	
	described	and clarified	ambiguities	
	comprehensively,	so that	unexplored,	Issue/ problem to
	delivering all	understandin	boundaries	be considered
	relevant	g is not	undetermined,	critically is stated
	information	seriously	and/ or	without
Explanatio	necessary for full	impeded by	backgrounds	clarification or
n of issues	understanding.	omissions.	unknown.	description.
			Information is	
			taken from	
	Information is	Information	source(s) with	
	taken from	is taken from	some	
	source(s) with	source(s)	interpretation/	
	enough	with enough	evaluation, but	
	interpretation/	interpretation	not enough to	Information is
Evidence	evaluation to	/ evaluation	develop a	taken from
Selecting	develop a	to develop a	coherent	source(s) without
and using	comprehensive	coherent	analysis or	any
information	analysis or	analysis or	synthesis.	interpretation/
to	synthesis.	synthesis.	Viewpoints of	evaluation.
investigate a	Viewpoints of	Viewpoints	experts are	Viewpoints of
point of	experts are	of experts are	taken as mostly	experts are taken
view or	questioned	subject to	fact, with little	as fact, without
conclusion	thoroughly.	questioning.	questioning.	question.
	Thoroughly		Ouestions some	Shows an
--------------	-------------------	----------------	-------------------	--------------------
	(systematically		assumptions	emerging
	and methodically)	Identifies	Identifies	awareness of
	analyzes own and	own and	several relevant	nresent
	others'	others'	contexts when	assumptions
	ounces	occumptions	presenting a	(sometimes labels
		assumptions	presenting a	(sometimes labels
			position. May	assertions as
та с	evaluates the	relevant	be more aware	assumptions).
Influence of	relevance of	contexts	of others'	Begins to identify
context and	contexts when	when	assumptions	some contexts
assumption	presenting a	presenting a	than one's own	when presenting a
S	position.	position.	(or vice versa).	position.
	Specific position			
	(perspective,			
	thesis/			
	hypothesis) is			
	imaginative,	Specific		
	taking into	position		
	account the	(perspective,		
	complexities of	thesis/hypoth		
	an issue. Limits	esis) takes		
	of position	into account		
	(nerspective	the		
	thesis/	complexities		
	hypothosis) are	of an issue		
	nypotnesis) are	Of an issue.	C : f	
	acknowledged.	Others points	specific	G 'C' '.'
	Others' points of	of view are	position	Specific position
Student's	view are	acknowledge	(perspective,	(perspective,
position	synthesized	d within	thesis/	thesis/
(perspectiv	within position	position	hypothesis)	hypothesis) is
е,	(perspective,	(perspective,	acknowledges	stated, but is
thesis/hypo	thesis/	thesis/	different sides	simplistic and
thesis)	hypothesis).	hypothesis).	of an issue.	obvious.
			Conclusion is	
		Conclusion is	logically tied to	
	Conclusions and	logically tied	information	
	related outcomes	to a range of	(because	
	(consequences	information,	information is	
	and implications)	including	chosen to fit the	Conclusion is
	are logical and	opposing	desired	inconsistently
Conclusion	reflect student's	viewpoints;	conclusion);	tied to some of
s and	informed	related	some related	the information
related	evaluation and	outcomes	outcomes	discussed; related
outcomes	ability to place	(consequence	(consequences	outcomes
(implicatio	evidence and	s and	and	(consequences
ns and	perspectives	implications)	implications)	and implications)
consequenc	discussed in	are identified	are identified	are
es)	priority order.	clearly.	clearly.	oversimplified.

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction			
	and conclusion,	Organizational		
	sequenced	pattern (specific	Organizational	
	material within	introduction	pattern (specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language		Language	
	choices are	Language	choices are	
	imaginative,	choices are	mundane and	Language
	memorable, and	thoughtful and	commonplace	choices are
	compelling, and	generally	and partially	unclear and
	enhance the	support the	support the	minimally
	effectiveness of	effectiveness of	effectiveness of	support the
	the	the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the
	speaker appears	interesting, and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Deliverv	confident.	comfortable.	tentative.	uncomfortable.

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks:

	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations from	quotations from	quotations from	statistics,
	relevant	relevant	relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
-	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic.	topic.	topic.	topic.
	Central			
	message is			
	compelling		~ .	
	(precisely	~ .	Central	~ 1
	stated,	Central	message is	Central message
	appropriately	message is clear	basically	can be deduced
	repeated,	and consistent	understandable	but 1s not
	memorable, and	with the	but is not often	explicitly stated
Central	strongly	supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities Date revised: February 15, 2022

> Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Wowh

TT

Assoc.Prof. Nguyen Van Sinh

Course Name: Software Architecture

Course Code: IT114IU

1. General information

Course designation	This course provides student methodogies and techniques in					
Semester(s) in which the course is taught	7					
Person responsible for the course	Dr. Ha Viet Uyen Synh	Dr. Ha Viet Uyen Synh				
Language	English					
Relation to curriculum	Elective (CS)					
Teaching methods	Lecture, lesson, project,	, seminar.				
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours: 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120					
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1					
Required and recommended prerequisites for joining the course						
Course objectives	Provides the student with a thorough understanding of varying methodologies and techniques in analysis, design and implementation of information system by using UML.					
Course learning outcomes	CLO 1. Understand the steps of the System Development Life Cycle and the techniques for each step CLO 2. Using a CASE tool in analysis and design of a system. CLO 3. Apply to a real system					
	Competency level	Course learning ou	itcome (C	LO)		
	Knowledge	1,2				
	Skill	3				
	Attitude					
Content	The description of the c weighting of the content Weight: lecture session Teaching levels: I (Intro	ontents should clearly t and the level. (3 hours) oduce); T (Teach); U	y indicate (Utilize)	the		
	Торіс		Weight	Level		
	Introduction to system design,	s analysis and	3	Ι		

Requirements.	3	T,U		
Use Case Modeling	6	T,U		
Dynamic Modeling	6	T,U		
State-Dependent Dynamic Interaction	6	T,U		
Modeling				
Data Modeling	6	T,U		
Normal Forms	6	T,U		
Structural Modeing 6				
Architectural Design. 3 I,T				
Multiple-choice questions, short-answer questions				
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 ha	ve more tl	nan		
50/100 points overall to pass this course.				
1. Kenneth E. Kendall, Julie E. Kendall, Systems Analysis				
and Design 7th, 2006				
2 Gary B Shelly Thomas I Cashman Harry I				
2. Gary B. Shelly, Thomas J. Cashman, Harry J.				
	Requirements. Use Case Modeling Dynamic Modeling State-Dependent Dynamic Interaction Modeling Data Modeling Normal Forms Structural Modeing Architectural Design. Multiple-choice questions, short-answer quest Attendance: A minimum attendance of 80 per compulsory for the class sessions. Students with basis of their class participation. Question are strongly encouraged. Assignments/Examination: Students must ha 50/100 points overall to pass this course. 1. Kenneth E. Kendall, Julie E. Kendall, S and Design 7th, 2006	Requirements.3Use Case Modeling6Dynamic Modeling6State-Dependent Dynamic Interaction6Modeling6Data Modeling6Normal Forms6Structural Modeing6Architectural Design.3Multiple-choice questions, short-answer questionsAttendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be asse the basis of their class participation. Questions and com are strongly encouraged.Assignments/Examination: Students must have more th 50/100 points overall to pass this course.1. Kenneth E. Kendall, Julie E. Kendall, Systems A and Design 7th, 2006		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1			X			
2			X			
3		X				

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to systems analysis and design,	1,2	Quiz	lecture, exercises	
2	Requirements.	1,2,3	Quiz, Lab	lecture, exercises, lab	
3	Use Case Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	
4	Midterm				
5	Dynamic Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	

6	State-Dependent Dynamic Interaction Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
7	Data Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
8	Normal Forms	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
9	Structural Modeing	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
10	Architectural Design.	1,2	Quiz	lecture, exercises
11	Final exam			

4. Assessment plan

Assessment Type

Assessment Type	CLO1	CLO2	CLO3
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	40%	40%	40%
Exercises/ Quiz (10%)	10%	10%	10%
Lab. Assignments (20%)	20%	20%	20%

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/	HW/Assignment:		
Date:			••	
	Evalı	ator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
Summary and conclusions appropriate and complete	5			
Organization (10%)				

Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
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

Holi	stic 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	Milest	one	Benchmark
	4	3	2	1
	4 Issue/ problem to be considered critically is stated clearly and described comprehensivel	3 Issue/ problem to be considered critically is stated,	2 Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities	1 Issue/ problem to be
	y, delivering all	described, and unexplored,		considered
	information	understanding is undetermine		stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.

			Information	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Fvidence	comprehensive	coherent	synthesis	interpretation/
Solocting and	analysis or	analysis or	Viewpoints	evaluation
Selecting unu	allarysis of	analysis of	viewpoints	Viewpoints of
using	Synthesis.	Synthesis.	of experts are	viewpoints of
information to	viewpoints of	viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific	Specific		
	position	position		
	(perspective.	(perspective.		
	thesis/	thesis/hypothesi		
	hypothesis) is	s) takes into	Specific	
	imaginative	account the	position	Specific
	taking into complexities c		(perspective	position
	account the	an issue Others'	thesis/	(perspective
Student's	complexities of	noints of view	hypothesis	thesis/
nosition	an issue I imite	are	acknowledge	hypothesis) is
(nersnective	of position	acknowledged	s different	stated but is
thesis/hynothesi	or position	uonito wieugeu		Stated, Out 15
	(perspective	within position	sides of an	simplistic and

	hypothesis) are	thesis/		
	acknowledged.	hypothesis).		
	Others' points of			
	view are			
	synthesized			
	within position			
	(perspective,			
	thesis/			
	hypothesis).			
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.

	.			
	Language			
	choices are			
	imaginative,		Language	
	memorable.	Language	choices are	
	and	choices are	mundane and	Language
	compelling	thoughtful and		choices are
	compenning,			
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Γαησμασε	audience	audience	audience	to audience
Lungunge	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eve	(posture.	(posture.	techniques
	contact, and	gesture, eve	gesture, eve	(posture, gesture,
	vocal	contact and	contact and	eve contact and
	expressiveness)	vocal	vocal	vocal
	males the	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations,	(explanations,	materials
	materials	examples.	examples.	(explanations.
	(explanations.	illustrations.	illustrations.	examples.
	examples.	statistics.	statistics.	illustrations.
	illustrations.	analogies.	analogies.	statistics.
	statistics	quotations	quotations	analogies
	analogies	from relevant	from relevant	quotations from
	quotations	authorities)	authorities)	relevant
	from relevant	make	make	authorities)
	authorities)	appropriate	appropriate	make reference
	make	reference to	reference to	to information or
	annronriata	information or	information or	analysis that
	appropriate	analysis that	analysis that	minimally
		anarysis tilat	anarysis that	
	information or	generally	partially	supports the
a	analysis that	supports the	supports the	presentation or
Supporting	significantly	presentation or	presentation or	establishes the
Material	supports the	establishes the	establishes the	presenter's

	presentation or establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	credibility/ authority on the topic.
	Central message is compelling (precisely stated, appropriately repeated, memorable,	Central message is clear and consistent with	Central message is basically understandable but is not often	Central message can be deduced but is not explicitly stated
Central Message	and strongly	the supporting	repeated and is	in the presentation
Central Message	stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	message is basically understandable but is not often repeated and is not memorable.	Central messa can be deduce but is not explicitly stat in the presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

T

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Net-centric Programming

Course Code: IT096IU

1. General information

Course designation	Advanced programming course with focus on developing network application						
Semester(s) in which the course is taught	6	6					
Person responsible for the course	MS	MSc. Le Thanh Son					
Language	Eng	lish					
Relation to curriculum	Cor Elec	npulsory (NE) ctive (CS)					
Teaching methods	Lec	ture					
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120						
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1						
Required and recommended prerequisites for joining the course	Cor	nputer Networks					
Course objectives	Advanced programming with a focus on developing software for networked systems using UNIX as a reference platform. Topics: Programming Tools, Software Design, Programming Techniques, Environment of a UNIX Process, Memory Allocation, Garbage Collection, Process Control, Process Relationships, Signals, Reliable Signals, Threads, I/O Multiplexing, Datagram and Stream Sockets, Multicasting, Device Driver and Kernel Programming. Secure Programming						
Course learning outcomes	CLO 1. Understand the structure of network applications CLO 2. Able to develop network applications using TCP and UDP sockets CLO 3. Understand and implement network applications using popular Internet protocols CLO 4. Team working						
		Competency level	Course learning outcome (CLO)				
		Knowledge	1, 2, 3				

		Skill	2, 3				
		Attitude	4				
Content	The weig Wei	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours)					
	To	Topic Weight Level					
	Ne	twork revisions		3	Ι		
	Int So	roduction to Client/S cket Programming	3	I, T	`		
	TC	P Socket Programmi	ing	3	Т, І	J	
	UI	OP Socket Programm	ing	3	Т, Ч	J	
	So	cket name and DNS		3	Т, Т	J	
	Ne	twork Data and Netw	vork Errors				
	Ca	ches and Message Qu	ueues	3	Т, Т	J	
	НЛ	HTTP Clients				J	
	ΗΊ	TP Server	3	Т, Т	J		
	We	eb Socket, Web Fram	3	Т, Т	J		
	We	eb Scraping		3	Т, Т	J	
	Bu	ilding and Parsing E	mail	3	Т, Т	J	
	FT	Р		3	Т, Т	J	
	Te	lnet and SSH		3	Т, І	J	
	Re	mote Procedure Call	(RPC)	3	Т, Т	J	
Examination forms	Mul	tiple-choice question	s, short-answer question	ons			
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	 Michael J.Donahoo, Kenneth L.Calvert, TCP/IP Socket in C: A Practical Guide for Programmers 2nd, 2009 W. R. Stevens, B. Fenner, A. M. Rudoff, Unix Network Programming, Vol. 1: The Sockets Networking API 3rd, 2003 Brandon Rhodes, Foundations of Python Network Programming 3rd, 2014 				in ,		

2. Learning Outcomes Matrix

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					
2		XX				
3		XXX				
4						X

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Network revisions	1	Quiz	Lecture	2
2	Introduction to Client/Server networking and Socket Programming	2	Quiz, Lab, Midterm	Lecture	1
3	TCP Socket Programming	2	Quiz, Lab, Midterm	Lecture, Discussion	1, 2
4	UDP Socket Programming	2	Quiz, Lab, Midterm	Lecture, Discussion	1, 2
5	Socket name and DNS	2	Quiz, Lab, Midterm	Lecture, Discussion	2, 3
6	Network Data and Network Errors	2	Quiz, Lab, Midterm	Lecture, Discussion	2, 3
7	Caches and Message Queues	2	Quiz, Lab, Midterm	Lecture, Discussion	2, 3
8	HTTP Clients	3, 4	Quiz, Lab, Final	Lecture, Discussion	2, 3
Midter	m exam	-			
9	HTTP Server	3, 4	Quiz, Lab, Final	Lecture, Discussion	2, 3
10	Web Socket, Web Frame Work	3, 4	Quiz, Final	Lecture, Discussion	2, 3
11	Web Scraping	3, 4	Quiz, Final	Lecture, Discussion	2, 3
12	Building and Parsing Email	3	Quiz, Final	Lecture, Discussion	2, 3
13	FTP	3	Quiz, Final	Lecture, Discussion	2, 3
14	Telnet and SSH	3	Quiz, Final	Lecture, Discussion	2, 3
15	Remote Procedure Call (RPC)	3	Quiz, Final	Lecture, Discussion	2, 3
Final e	exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quiz / Assigment (10%)		10%	10%	100%
Labs (20%)	30%	30%	40%	
Midterm examination (30%)	70%	40%		
Final examination (40%)		20%	50%	

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

 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.

5. Rubrics (optional)

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

5.1. Grading checklist

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HWScoreDescription

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
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information	
	taken from	taken from	is taken from	
	source(s) with	source(s) with	source(s)	
	enough	enough	with some	Information is
	interpretation/	interpretation/	interpretation	taken from
	evaluation to	evaluation to	/ evaluation,	source(s)
	develop a	develop a	but not	without any
Evidence	comprehensive	coherent	enough to	interpretation/
Selecting and	analysis or	analysis or	develop a	evaluation.
using	synthesis.	synthesis.	coherent	Viewpoints of
information to	Viewpoints of	Viewpoints of	analysis or	experts are
investigate a	experts are	experts are	synthesis.	taken as fact,
point of view or	questioned	subject to	Viewpoints	without
conclusion	thoroughly.	questioning.	of experts are	question.

			takan as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	nresent
	and		contexts	accumptions
	and mothedian (1)		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific	positioni	(cibu):	poblici
	position			
	(perspective			
	thesis/			
	hymothesis) is			
	inypotnesis) is			
	imaginative,			
	taking into	a : a		
	account the	Specific		
	complexities of	position		
	an issue. Limits	(perspective,		
	of position	thesis/hypothesi		
	(perspective,	s) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective.	(perspective	(perspective	s different	stated, but is
thesis/hynothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis)	hypothesis)	issue	obvious
· · · /	mppourosis).	in pouronoj.	10040.	0011045.

			Conclusion	
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	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 techniques	Delivery	Delivery	Delivery
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations	quotations	quotations	statistics,
	from relevant	from relevant	from relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic.	the topic.	the topic.	topic.
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable,	consistent with	but is not often	explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Wowh

Assoc.Prof. Nguyen Van Sinh

TT

Course Name: Internship

Course Code: IT082IU

1. General information

Course designation	This course helps students to do an internship in industry and prepare a topic for a pre-thesis and thesis
Semester(s) in which the course is taught	7
Person responsible for the course	Lecturer of School of Computer Science and Engineering; Advisor of the Company/Organization (in Industry)
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Total workload: 90 hours Private study including examination preparation, specified in hours: 90
Credit points	Number of credits : 3 Lecture: 0 Laboratory: 3
Required and recommended prerequisites for joining the course	Follows requirements of the academic program
Course objectives	This course requires students to work in IT-related organizations or businesses from June to September. Each student has supervised by a faculty member at the School and an instructor at the organization. The student will join/run a technical project, and/or participate in soft skills courses. The internship lasts minimum 8 weeks and 3 sessions per week. Students have to report progress to instructors after 3 weeks of receiving the project. Depending on the project requirements of the organization or business, students may arrange for longer time. At the end of the internship, students will submit internship reports and assessment reports from the instructor at the organization or business to the School. Instructors read the reports and confirm the internship marks for the students. Students can also register this course in main semesters or take part in internships abroad for a period of 6 months. The registration and evaluation process are similar.
Course learning outcomes	CLO 1. Recognize the roles of an engineer in practical environment.

	CLO proj	CLO 2. Develop practical products or run product development projects in industry CLO 3. Follow requirements/regulations and laws				
		Competency level Course learning outcome (CLO)				
		Knowledge	CLO1, CLO2		,	
		Skill	CLO1, CLO2			
		Attitude	CLO3			
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: within 3 months Teaching levels: I (Introduce): T (Teach): II (IItilize)					
	To	opic		Weight	Level]
	Int	roduction of the inter	rnship place	9	U	
	Re pro	Review the existing issues of an assigned project			U	
	Stu de	udy and solve some is velopment	ssues in product	9	U	
	Im for	plement some new fu the project product	unctions or features	9	U	
	Pre	esentation		9	U	
Examination forms	Mu	ltiple-choice question	ns, short-answer questi	ons		
Study and examination	Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of					
requirements	their class participation. Questions and comments are strongly					
	enc	ouraged.	n. Students must have	more that	•	
	ASS 50/	100 points overall to	bass this course.		1	
Reading list						

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1		Х				Х
2		Х				Х
3				Х	Х	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning	Resources
				activities	

1	Introduction of the internship place	1,2	Check and Evaluate	Research and working	At company or organization
3	Review the existing issues of an assigned project	1,2	Check and Evaluate	Research and working	At company or organization
4	Study and solve some issues in product development	1,2	Check and Evaluate	Research and working	At company or organization
5	Implement some new functions or features for the project product	1,2	Check and Evaluate	Research and working	At company or organization
6	Presentation	1,2,3	Check and Evaluate	Research and working	At company or organization
7	Final grade				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Final grade (100%)	30%	40%	30%

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

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

5.

Rubrics (optional) . Grading checklist 5.1.

	TOTAL SCORE	100	
5.2. Holistic rubric			

0121 1101	
Holi	stic 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 mended 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	Milest	one	Benchmark
	4	3	2	1
	Issue/ problem to be considered critically is stated clearly and described comprehensivel y, delivering all relevant information necessary for	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermine d, and/ or	Issue/ problem to be considered critically is stated without clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information	Information is
Evidence	taken from	taken from	is taken from	taken from
Selecting and	source(s) with	source(s) with	source(s)	source(s)
using	enough	enough	with some	without any
information to	interpretation/	interpretation/	interpretation	interpretation/
investigate a	evaluation to	evaluation to	/ evaluation,	evaluation.
point of view or	develop a	develop a	but not	Viewpoints of
conclusion	comprehensive	coherent	enough to	experts are

	analysis or	analysis or	develop a	taken as fact,
	synthesis.	synthesis.	coherent	without
	Viewpoints of	Viewpoints of	analysis or	question.
	experts are	experts are	synthesis.	•
	questioned	subject to	Viewpoints	
	thoroughly.	questioning.	of experts are	
			taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'	T1	position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others	identify some
I., A.,	relevance of	several relevant	assumptions	contexts
influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
	position.	position.	versa).	position.
	position			
	(nerspective			
	thesis/			
	hypothesis) is			
	imaginative.	Specific		
	taking into	position		
	account the	(perspective,		
	complexities of	thesis/hypothesi		
	an issue. Limits	s) takes into		
	of position	account the		
	(perspective,	complexities of	Specific	
	thesis/	an issue. Others'	position	Specific
	hypothesis) are	points of view	(perspective,	position
	acknowledged.	are	thesis/	(perspective,
Student's	Others' points of	acknowledged	hypothesis)	thesis/
position	view are	within position	acknowledge	hypothesis) is
(perspective,	synthesized	(perspective,	s different	stated, but is
thesis/hypothesi	within position	thesis/	sides of an	simplistic and
S)	(perspective,	hypothesis).	issue.	obvious.

	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 (consequence s and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequence s and implications) are oversimplifie d.

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and makes the		transitions) is	the body, and
			intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.

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	presentation or establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	credibility/ authority on the topic.
Central	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly	Central message is clear and consistent with the supporting	Central message is basically understandable but is not often repeated and is	Central message can be deduced but is not explicitly stated in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

science Mouth

Assoc.Prof. Nguyen Van Sinh

Course Name: Software Engineering

Course Code: IT076IU

1. General information

Course designation	This course focuses on the design of software by implementing significant projects in teams				
Semester(s) in which the course is taught	5,7				
Person responsible for the course	Assoc. Prof. Dr. Nguyen Thi Thuy Loan				
Language	English				
Relation to curriculum	Compulsory (CS, CE) Elective (NE)				
Teaching methods	Lecture, lesson, project, seminar.				
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120				
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1				
Required and recommended prerequisites for joining the course	IT069IU (Object-Oriented Programming)				
Course objectives	This course provides students the fundamentals of software engineering concepts, methodologies, and processes. It covers the subjects on software process models, agile development methodologies, requirements engineering and analysis models, software design and implementation methods, test strategies, and software evolution. Students apply contemporary agile requirements analysis, planning, architecture, design, implementation and testing practices to software engineering project work in small teams.				
Course learning outcomes	CLO 1. Describe the implement of software development process. CLO 2. Apply the principles and methods of software engineering in practice. CLO3. Practice teamwork skills in a software engineering project.				

		Knowledge	CLO1					
		Skill	CLO2, CLO3					
		Attitude	CLO3					
Content	The	e description of the contents should clearly indicate the						
	wei	ghting of the content and the level.						
	We	ight: lecture session ((3 hours)					
	Tea	ching levels: I (Intro	duce); T (Teach); U	(Utilize)	 1	1		
		Торіс	Topic Weight Level					
		Software developme	ent in practice	3	Ι			
		Beginning a project	- - -	3	T, U			
		Requirements		7.5	T, U			
		The user experience	The user experience 4		T, U			
		System design		6	T, U			
		Program development		7.5	T, U			
		Reliability and testin	6	T, U				
		The business of soft	The business of software development					
		Review	3	I, U				
Examination forms	Mu	Multiple-choice questions, short-answer questions						
Study and	Atte	endance: A minimum	attendance of 80 p	ercent is c	ompulse	ory		
examination	for	the class sessions. Stu	udents will be asses	sed on the	basis of	f		
requirements	thei	their class participation. Questions and comments are strongly						
	enc	ouraged.						
	Ass	ignments/Examinatio	on: Students must ha	ave more t	than 50/1	100		
	poir	nts overall to pass thi	s course.					
Reading list	1	. Ian Sommerville, S	Software Engineerin	ıg 10th, 20)19.			
	2	. Hyrum Wright, Tit	us Winters, and Tor	m Manshr	eck.			
		Software Engineer	ing at Google, 2020)				
	3	. Hans van Vliet, So	ftware Engineering	: Principle	es and			
		Practice 3rd. 2008						

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1						XXX
2			XX			XXX
3			XX		XXX	

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Software development in practice	1	Quiz	Lecture	[1]
2	Beginning a project	1,3	Quiz, Midterm, Project	Lecture, Discussion, In- class, exercise	[1,3]
3	Requirements	2,3	Quiz, Midterm, Project	Lecture, Discussion, In- class, exercise	[1,2]
4	The user experience	2,3	Quiz, Midterm, Project	Lecture, Discussion, In- class, exercise	[1,2]
5	System design	2,3	Quiz, Midterm, Project	Lecture, Discussion, In- class, exercise	[1,2,3]
6	Midterm				
7	Program development	2,3	Quiz, Final, Project	Lecture, Discussion, In- class, exercise	[1,2,3]
8	Reliability and testing	2,3	Quiz, Final, Project	Lecture, Discussion, In- class, exercise	[1,2,3]
9	The business of software development	2,3	Quiz, Project	Lecture, Discussion, In- class, exercise	[1,2,3]
10	Review	1,3	Quiz	Discussion, In- class, exercise	[1,2]
11	Final exam				

3. Planned learning activities and teaching methods

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Midterm examination (25%)	30%	20%	
Projects/Presentations/ Report (25%)	30%	30%	60%
Final examination (40%)	30%	40%	
Exercises/ Quiz (10%)	10%	10%	40%

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

2. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports

Student:	HW/A	Assignme	ent:
Date:			
	Evalu	ator:	
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and summarizes	10		
principal content			
Introduction demonstrates thorough knowledge of	15		
relevant background and prior work			
Analysis and discussion demonstrate good subject	30		
mastery			
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good	5		
transitions			
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

Holi	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

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

			assumptions than one's	presenting a position.
			own (or vice versa).	
	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	Specific position (perspective, thesis/hypothesi s) takes into account the complexities of an issue. Others' points of view	Specific position (perspective	Specific
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
	hypothesis).	hypothesis).	Conclusion	oovious.
	Conclusions and related	Conclusion is	is logically tied to information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	viewpoints:	aesirea	uiscussed;
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Oral communication value rubric for evaluating presentation tasks:

	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion	nattern	Organizational	
	sequenced	(specific	nattern	
	material within	introduction	(specific	Organizational
	the body and	and conclusion	introduction	nattern (specific
	transitions) is	sequenced	and conclusion	introduction and
	clearly and	material within	sequenced	conclusion
	consistently	the body and	material within	sequenced
	observable and	transitions) is	the body and	motorial within
	is skillful and	algority and	transitions) is	the body and
	no skilling the	clearly and	intermittently	the body, and
	makes the	consistently	abaamaabla	abaamaabla
	content of the	observable	observable	observable
0	presentation	within the	within the	within the
Organization	conesive.	presentation.	presentation.	presentation.
	Language			
	choices are		T	
	imaginative,	.	Language	
	memorable,	Language	choices are	-
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eye contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Deliverv	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations	quotations	quotations	statistics,
	from relevant	from relevant	from relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic.	the topic.	the topic.	topic.
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable,	consistent with	but is not often	explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

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Assoc.Prof. Nguyen Van Sinh
Course Name: Web Application Development

Course Code: IT093IU

Course designation	This subject introduces to students the development of web application. How to design and program a web-app in practice based on the tools, techniques and web frameworks					
Semester(s) in which the course is taught	6					
Person responsible for the course	Assoc.	Prof. Nguyen Van Sinł	1			
Language	English					
Relation to curriculum	Compu	lsory (NE, CE, CS)				
Teaching methods	Lecture	Lecture, lesson, project, seminar.				
Workload (incl. contact hours, self- study hours)	Total w Contact etc.): 45 Private	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120				
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1					
Required and recommended prerequisites for joining the course	Object-Oriented Programming Principles of Database Management					
Course objectives	This course provides students the fundamentals of web design and web programming. It provide the concepts and models of HTML, Java Server Page, Java Bean, MVC model, Java utilities and development environments, extended Java frameworks, several new frameworks with different programming languages. To develop skills in understanding and evaluating web-based systems, as well as to develop skills in designing and developing web-based applications					
Course learning outcomes	 CLO 1. Understand web design, web programming concepts and models. CLO 2. Apply to design and develop static/dynamic web application with HTML, Java Server Pages, Java Bean, extended Java and other frameworks based on the MVC model. CLO 3. Apply knowledge and ability to manage and use Java, XML utilities and IDE for developing web applications with DBMS. CLO 4: work in group, communication, interaction and responsible within a team. 					
		Competency level	Course learning outcom	e (CLO)		
		Knowledge	CLO1			
		Skill	CLO2, CLO3			
	Attitude CLO4					
Content	 The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 teaching hours) Teaching levels: I (Introduce); T (Teach): U (Utilize) 					
	Торі	c		Weight	Level	
	Week 1: Introduction to the course and HTML 3 I,T					

1. General information

	3	I,T,U				
	Week 3: Introduction to J2EE and new frameworks in web application	3	I,T			
	Week 4 : Servlet	3	I,T,U			
	Week 5: Java server page and JDBC	3	I,T,U			
	Week 6: Java Bean and MVC	3	I,T,U			
	Week 7: Web state, session, cookies & midterm review	3	I,T,U			
	Week 8: Java Script, APIs and Libraries	3	I,T,U			
	Week 9&10: Node JS Framework	3	I,T,U			
	Week 11: Graphical models on the webpage, web multimedia and web 360	3	I,T,U			
	Week 12&13: XML & XSLT	3	I,T,U			
	Week 14: Ajax framework	3	I,T,U			
	Week 15: the existing web frameworks & final review	3	I,T,U			
Examination forms	Multiple-choice questions, short-answer questions and pro-	ogramming	5			
Study and	Attendance: A minimum attendance of 80 percent is comp	pulsory for	the class			
examination	sessions. Students will be assessed on the basis of their cl	ass particip	bation.			
requirements	Assignments/Examination: Students must have more than	50/100 po	ints			
	overall to pass this course.	. 50/100 po	11105			
Reading list	1. Dave Wolf and A.J. Henley. "Java EE Web Application Primer Building Bullhorn: A Messaging App with JSP, Servlets, JavaScript, Bootstrap and Oracle", 2017.					
	2. Prem Kumar Karunakaran. "Java Web Application Development", second edition, 2020.					
	 Laura Ubelhor and Christian Hur. "Developing Business Application for the Web With HTML, CSS, JSP, PHP, ASP.NET and JavaScript", 2017. 					
	 Refer VN book: N.V.Sinh, N.T.T.Sang, T.M.Hà "X Web cho Thương mại điện tử trên Netbeans", Nh 2017 	Cây dựng ứ à xuất bản	ng dụng Xây dựng			

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х	Х				
2		Х				
3		Х				Х
4					Х	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to the course and HTML	1	Quiz	Lecture,	[1,2]
2	Advanced HTML and CSS	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion,	[1,2,3]

				In-class exercises	
3	Introduction to J2EE and new frameworks in web application	1	Quiz, Midterm	Lecture, Discussion	[1,2]
4	Servlet	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
5	Java server page and JDBC	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
6	Java Bean and MVC	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
7	Web state, session, cookies & midterm review	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
8	Java Script, APIs and Libraries & midterm review	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
9	Node JS Framework	2,3	Quiz, Lab	Lecture, Discussion, In-class exercises	[1,2,3,4]
10	Node JS Framework (continue)	2,3	Quiz, Lab	Lecture, Discussion, In-class exercises	[1,2,3,4]
11	Graphical models on the webpage, web multimedia and web 360	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
12	XML & XSLT	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
13	XML & XSLT (continue)	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
14	Ajax framework	2,3	Quiz, Lab	Lecture, Discussion, In-class exercises	[1,2,3,4]
15	Existing web frameworks & final review	2,3	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1,2,3,4]
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (20%)		30%	40%	30%
Midterm examination (30%)	40\$	60%		
Exercises/Quiz (10%)	30%	40%	30%	
Final examination (40%)		50%	50%	

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	10				
content					
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				
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	Miles	Benchmark	
	4	3	2	1
Explanation of	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
			Information is taken from source(s) with some interpretation/	
Evidence	Information is taken from source(s) with enough interpretation/ evaluation to	Information is taken from source(s) with enough interpretation/ evaluation	evaluation, but not enough to develop a coherent analysis or	Information is taken from source(s) without
Selecting and using	develop a comprehensive	to develop a coherent	synthesis. Viewpoints of	any interpretation/
injormation to	analysis or synthesis.	analysis or synthesis.	experts are taken as	of experts are taken as
view or conclusion	questioned thoroughly.	subject to questioning.	questioning.	fact, without question.

Influence of content	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the	Identifies own and others' assumptions and several	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others'	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some
and assumptions	presenting a position	presenting a position	own (or vice versa)	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 (consequences and implications) are logical and	Conclusion is logically tied to a range of information, including opposing viewpoints;	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some	Conclusion is inconsistently tied to some of the information discussed;
Conclusions and	reflect student's informed	related outcomes	related outcomes	related outcomes
related outcomes	evaluation and ability to place	(consequences and	(consequences and	(consequences and
(implications and	evidence and perspectives	implications) are identified	implications) are	implications) are
consequences)	discussed in priority order.	clearly.	identified clearly.	oversimplified.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	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	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.

repeated, memorable, and		
strongly supported.)		

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

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Assoc.Prof. Nguyen Van Sinh

Course Name: Artificial Intelligence

Course Code: IT159IU

1. General information

Course designation	This subject introduces the students to the principles and fundamental algorithms of Artificial Intelligence, the use cases and the related processes in Artificial Intelligence.				
Semester(s) in which the course is taught	6,8				
Person responsible for the course	Dr. Nguyen Trung Ky				
Language	English				
Relation to curriculum	Elective				
Teaching methods	Lecture, lesson, project, laboratory.				
Workload (incl.	Total workload: 195				
contact hours,	Contact hours: 45 hours (lectures) + 30 hours (laboratory)				
self-study hours)	Private study including examination preparation, specified in hours: 120				
Credit points	Number of credits: 4				
erean penne	Lecture: 3				
	Laboratory: 1				
Required and	Object-Oriented Programming				
recommended	Algorithms and Data Structures				
prerequisites for	Discrete Mathematics				
joining the course	Probability, Statistic & Random Process				
Course objectives	This course introduces students to the basic knowledge on Artificial Intelligence. Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. In this course, student will learn the foundational principles and practice implementing some of these applications including representation, problem solving, and learning methods of artificial intelligence. Accordingly, students should be able to develop intelligent systems by assembling solutions to concrete computational problems; understand the role of knowledge representation, problem solving, and learning in intelligent-system engineering; and appreciate the role of problem solving, vision, and language in understanding human intelligence from a computational perspective.				
Course learning outcomes	CompetencyCourse learning outcome (CLO)level				

	Knowledge	CLO 1. Apply knowledge of A synthesize solutions to the disc to develop a range of typical a artificial intelligence methods CLO 2. Represent knowledge practical problems, design, evaluate a computer-based s component, or program to meet properly using classical sea including breadth-first, depth heuristic search CLO 3. Produce intelligent machine learning with stat methods (Naive Bayes),	AI techniqu ipline and pplication correspon- implemen system, p desired ne arch algo n-first, A application tistical le supervised	ues and ability s using ding to at, and rocess, eeds by rithms, *, and ons of earning d and
	Attitude	unsupervised learning models neural networks, single-layer multilayer networks CLO 4. Communicate effective of audiences, ability to use cu skills, and tools necessary practice, ability to apply foundations, algorithmic pro- computer science theory in the design of computer-based systendemonstrates comprehension involved in design choices and design and development pro- construction of software systendemonstrates	s: decisio (perceptro rely with a rrent tech for con mather principles, ne modelin ems in a w of the tra d ability to rinciples tems of w	n tree, on) and a range niques, nputing matical and ng and vay that de-offs o apply in the varying
Content	The description weighting of the	n of the contents should clear	arly indic	cate the
	Weight: lecture	session (3 hours)		
	Teaching levels	: I (Introduce); T (Teach); U (Ut	ilize)	T
	I opic	d Intalligant Aganta	vv eight	Level
	States and Sear	rching: Uninformed Search	1	T.U
	States and Searching: Uninformed Search			T. U
	Sophisticated S	Search	1	1,0
	Features and Satisfaction Pr	d Constraints: Constraint oblems	1	T, U
	Features and Satisfaction Pr	d Constraints: Constraint oblems (continue)	1	T, U
Reasoning Under Uncertainty:				T, U

	Joint and Marginal DistributionsConditional Distribution		
	Product Rule, Chain Rule, Bayes'		
	Rule		
	Inference		
	Reasoning Under Uncertainty: Naïve Bayes Classifier (continue)	1	T, U
	Supervised Learning: Neural Networks	1	T, U
	Supervised Learning: Neural Networks (continue)	1	T, U
	Supervised Learning: Support Vector Machine	1	T, U
	Supervised Learning: Support Vector Machine in Mathematics	1	T, U
	Beyond Supervised Learning: Kernels and Clustering	1	T, U
	Beyond Supervised Learning: Kernels and Clustering (continue)	1	T, U
	Gaussian Mixture Model and Expectation- Maximization Algorithm	1	T, U
	Revision	1	
Examination forms	Multiple-choice questions, short-answer questio	ns	
Study and	Attendance: A minimum attendance of 80 perc	ent is con	npulsory
examination	for the class sessions. Students will be assessed o	on the basis	s of their
requirements	class participation. Questions and commen	nts are	strongly
	encouraged.	.1	50/100
	Assignments/Examination: Students must have	more than	1 50/100
Deading list	points overall to pass this course.	aial Intall	innun
Reading list	Modern Approach" Fourth Edition 2020	101 1111011	igence. 1
	[2] David L. Poole and Alan K. Mackworth. "A	rtificial Int	telligence
	Foundations of Computational Agents", Second	l Edition, 2	2017.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х	X				
2		X				x
3		X				X

4	Х	Х		x

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction and Intelligent Agents	1, 2	Quiz	Lecture, Discussion	[1]. Chapter1, 2[2]. Chapter1
2	StatesandSearching:GraphSearchingTechniques	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 3
3	States and Searching: Heuristic Search and More Sophisticated Search	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 3
4	Features and Constraints: Constraint Satisfaction Problems	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 6
5	Features and Constraints: Constraint Satisfaction Problems (continue)	1, 2	Quiz	Lecture, In-class quiz	[1]. Chapter 6
6	Reasoning Under Uncertainty	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 12
7	Reasoning Under Uncertainty (continue)	3, 4	Quiz	Lecture, In-class quiz	1]. Chapter 12
8	Midterm				
9	Supervised Learning: Neural Networks	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter19[2]. Chapter20
10	Supervised Learning: Neural Networks (continue)	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter19[2]. Chapter20
11	Supervised Learning: Support Vector Machine	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter19[2]. Chapter15
12	Supervised Learning: Support Vector Machine in Mathematics (continue)	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 15
13	Beyond Supervised Learning: Kernels and Clustering	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 21

					[2]. Chapter 16, 22
14	Beyond Supervised Learning: Kernels and Clustering (continue)	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter21[2]. Chapter16, 22
15	Gaussian Mixture Model and Expectation- Maximization Algorithm	3, 4	Quiz	Lecture, Discussion	[1]. Chapter20[2]. Chapter24
16	Revision			Review-test	
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)		50%	50%
Midterm examination (30%)	50%	50%	
Final examination (40%)		100%	
Exercises/ Quiz (10%)	50%	50%	

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

1. 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. Δ

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports				
Student: HW/Assignment:				
Date:	•••••	-		
	Evalu	ator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
Summary and conclusions appropriate and complete	5			

Organization (10%)		
Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
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

Holi	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	Milest	one	Benchmark
	4	3	2	1
			Issue/	
			problem to	
			be	
	Issue/ problem		considered	
	to be considered		critically is	
	critically is	Issue/ problem	stated but	
	stated clearly	to be considered	description	
	and described	critically is	leaves some	Issue/
	comprehensivel	stated,	terms	problem to be
	y, delivering all	described, and	undefined,	considered
	relevant	clarified so that	ambiguities	critically is
	information	understanding is	unexplored,	stated without
	necessary for	not seriously	boundaries	clarification
Explanation of	full	impeded by	undetermine	or
issues	understanding.	omissions.	d, and/ or	description.

			backgrounds	
			unknown	
			unknown.	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Evidence	comprehensive	coherent	synthesis.	interpretation/
Selecting and	analysis or	analysis or	Viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	Viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	G1
			assumptions.	Shows an
	Thomas ally		Identifies	emerging
	(systematically		relevant	awareness or
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		nresenting a	labels
	and others'		presenting a	assertions as
	assumptions	Identifies own	May be more	assumptions)
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific	Specific		Specific
	position	position	Specific	position
	(perspective,	(perspective,	position	(perspective,
Student's	thesis/	thesis/hypothesi	(perspective,	thesis/
position	hypothesis) is	s) takes into	thesis/	hypothesis) is
(perspective,	imaginative,	account the	hypothesis)	stated, but is
thesis/hypothesi	taking into	complexities of	acknowledge	simplistic and
s)	account the	an issue. Others'	s different	obvious.

	complexities of	points of view	sides of an	
	an issue. Limits	are	issue.	
	of position	acknowledged		
	(perspective,	within position		
	thesis/	(perspective,		
	hypothesis) are	thesis/		
	acknowledged.	hypothesis).		
	Others' points of			
	view are			
	synthesized			
	within position			
	(perspective,			
	thesis/			
	hypothesis).			
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities

Oral communication value rubric	for evaluating presentation	tasks:
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	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational	Organizational		
	pattern	pattern	Organizational	Organizational
	(specific	(specific	pattern	pattern (specific
	introduction	introduction	(specific	introduction and
	and conclusion,	and conclusion,	introduction	conclusion,
	sequenced	sequenced	and conclusion,	sequenced
	material within	material within	sequenced	material within
	the body, and	the body, and	material within	the body, and
	transitions) is	transitions) is	the body, and	transitions) is not
	clearly and	clearly and	transitions) is	observable
	consistently	consistently	intermittently	within the
Organization	observable and	observable	observable	presentation.

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	in abrillful and	within the	within the	
	makes the	presentation.	presentation.	
	content of the			
	presentation			
	cohesive.			
	Language			
	choices are			
	imaginative,		Language	
	memorable,	Language	choices are	
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eye contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations,	(explanations,	materials
	materials	examples,	examples,	(explanations,
	(explanations,	illustrations,	illustrations,	examples,
	examples,	statistics,	statistics,	illustrations,
	illustrations,	analogies,	analogies,	statistics,
	statistics,	quotations	quotations	analogies,
	analogies,	from relevant	from relevant	quotations from
	quotations	authorities)	authorities)	relevant
	from relevant	make	make	authorities)
Supporting	authorities)	appropriate	appropriate	make reference
Material	make	reference to	reference to	to information or

				1
	appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on	information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
	the topic			
	Central message is compelling			
	(precisely		Central	
	stated, appropriately repeated, memorable,	Central message is clear and consistent with	message is basically understandable but is not often	Central message can be deduced but is not explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Wowh

Assoc.Prof. Nguyen Van Sinh

Course Name: General Law

Course Code: PE021IU

1. General information

Department	Office of Academic Affairs
Course classification	Foundation course
Course designation	Face to face
Semester(s) in which the course is taught	All semesters in each academic year
Person responsible for	Dr. Vo Tuong Huan LLM. Bui Doan Danh Thao
the course	
Language	English
Relation to curriculum	Compulsory
Teaching methods	Student-centred approach
Workload (incl.	(Estimated) Total workload: 127.5 hours)
contact hours, self-study hours)	Contact hours (lecture, in class discussions): 37.5 hours (=45 periods)
	Private study including examination preparation, specified in hours ⁷ : 90 hours
Credit points	3
Required and recommended prerequisites for joining the course	N/A

⁷ 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	The overarching aims of this course are to:
	• Provide essential knowledge of Vietnamese legal system through integrated technology and real cases for social and cultural sustainability.
	• Raise awareness of responsibility toward others and how to stand for ending all types of legal violations, especially corruption in various social contexts .
	• Practice necessary skills to act as an ambassador to ensure social fairness and global equitable rights.
	• Use integrated online legal resources and communication tools to help the community to identify issues and develop countermeasures.

Course learning	Upon the successful completion of this course, students will be able		
outcomes	to:		
	Competency	Course learning outcome (CLO)	
	level		
	Knowledge	CLOI. Apply appropriate legal knowledge in	
		the Vietnamese legal system to solve legal	
		issues in various social contexts for a fair	
		sustainable lifelong being.	
		CLOI.1. Apply general knowledge on	
		state and law to solve legal issues in various	
		social contexts 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 various social contexts for a fair	
	<u>S1-:11</u>	Sustainable metong being.	
	SKIII	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	
		various social contexts.	
	Attitude	CLO4. Detect the responsibility to ensure social	
		and cultural fairness, including ending	
		corruption, in various social contexts through	
		understanding importance of law in social	
		contexts.	
		CLO5. Respond to the base for coexistence in various social contexts.	
Content	The course will	introduce students to Vietnamese legal systems. In	
Content	particular, stude	nts will understand their rights and obligations in	
	the Constitution	, Criminal law, administrative law, civil law, labor	
	law and enterprint	se law of Vietnam. From this, students will raise	
	awareness towar	ds their responsibility to ensure justice, including	
	ending corrupt	ion, in society.	
Examination	Multiple choice	questions	
forms	Case-based exar	ns	
	Essay exams		
	Oral exams		

Study and
examination
requirements

To pass this course, the students must:

- Achieve a composite mark of at least 50; and
- Make a satisfactory attempt at all assessment tasks (see below).

GRADING POLICY

Grades can be based on the following:

Assignment	20%
Midterm examination	30%
Final examination	50%
Total	100%

COURSE POLICIES

Attendance

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.

Workload

It is expected that the students will spend at least *six* 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.

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.

General Conduct and Behaviour

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 <u>the university webpage</u>.

Keeping informed

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.		
	Academic honesty and plagiarism		
	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 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.		
	Special consideration		
	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.		
	Meeting up with the lecturers after classes		
	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.		
Reading list	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.		
	Required Course Texts and Materials		
	Legal Texts:		
	1. Constitution of Vietnam - 2013 2. Civil Code of Vietnam - 2015		
	 Criminal Code of Vietnam - 2015 Criminal Code of Vietnam - 2015 (amended in 2017) Law on Law on Handling of Administrative Violations 2012 		
	5. Law on Enterprises – 2020		
	7. Law on anti-corruption 2018		
	Available at https://luatvietnam.vn/ or Blackboard		
	Books:		
	 PGS.TS. Phan Trung Hien, Giáo trình Pháp Luật Đại cương, NXB Chính Trị Quốc Gia Sự Thật 2022. 		
	 Mai Hong Quy (Chief Editor) (2nd 2017), Introduction to Vietnamese Law, Hong Duc Publishing House. 		

Additional materials provided in Blackboard
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.
Optional Course Texts and Materials
Recommended Internet sites
<u>UNCTAD</u> (United Nations Conference on Trade and Development)
WTO (World Trade Organization)
MOIT - Vietnam (Official website of Ministry of Industry and Trade)
<u>MPI - Vietnam</u> (Official website of Ministry of Planning and Investment)
Other Resources, Support and Information
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 <u>VNU</u> - <u>Central Library</u> . Recommended articles will be duly informed to the students.
Books:
 Nguyen Phu Trong, 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, NXB Chính Trị Quốc Gia Sự Thật 2023.
 University of Law Ho Chi Minh City, Giáo trình luật Hiến pháp Việt nam, NXB Hồng Đức 2023.
 University of Law Ho Chi Minh City, Giáo trình Luật hành chính, NXB Hồng Đức 2022.
 University of Law Ho Chi Minh City, Giáo trình Luật hình sự Việt Nam, NXB Hồng Đức 2022.
 University of Law Ho Chi Minh City, Giáo trình Luật dân sự Việt Nam, NXB Hồng Đức 2022.
 University of Law Ho Chi Minh City, Giáo trình Luật lao động Việt Nam, NXB Hồng Đức 2022.
 University of Law Ho Chi Minh City, Giáo trình pháp luật về chủ thể kinh doanh, NXB Hồng Đức 2022.

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:

		PLO/SLO								
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

				Learnin g	
Wee				activitie	
k	Торіс	CLO	Assessments	S	Resources
	 Introduction to State What is State? Nature of state Forms of state Functions of state Introduction to structure of Vietnamese state 	1-5 (level I - introdu ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPT - Introductio n to Vietnames e legal system available on
2	 Introduction to law? What is law? Nature of law Forms of law Structure of law Categorization of legal system. Enforcement Breach of law and liabilities for breach of law Introduction to structure of Vietnamese legal system 	1-5 (level I - introdu ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPT - Introductio n to Vietnames e legal system available on Blackboard
3	 Constitutional Law General introduction on Vietnamese Constitution and its 	1-5 (Level R - reinfor ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPTs – Constitutio nal law available on Blackboard

	 nature and basic principles. Political, economic and other regimes of Vietnam Basic rights and responsibilities of citizens. Relationship between citizens and the State. Structure, functions and duties of Vietnamese state, especially in prevention of corruption 				Constitutio n 2013 available on Blackboard
4	 Constitutional Law (Cont) Structure and functions and duties of Vietnamese state Duties of the state in prevention of corruption 	1-5 (Level R - reinfor ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPTs – Constitutio nal law available on Blackboard Constitutio n 2013 available on Blackboard
5	 Administrative Law Definition and nature of administrative law Administrative law violations Liabilities for breach of administrative law, exemption from the liability 	1-5 (Level R - reinfor ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies and law on anti- corrupti on	PPT– Administra tive law available on Blackboard Law on handling administrat ive violations 2012, and Law on anti- corruption 2018 available

6	Criminal Law • Definition and nature of criminal law • Crimes • Punishments	1-5 (Level R - reinfor ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies, especiall y cases related to corrupti on	on Blackboard PPT– Criminal law available on Blackboard Criminal code 2015 available on Blackboard
7	Criminal Law (Cont) Crimes related to corruption Punishments for corruption 	1-5 (Level R - reinfor ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies, especiall y cases related to corrupti on	PPT- Criminal law available on Blackboard Criminal code 2015 available on Blackboard
8	Revision for mid-term exam		Quizzes Projects		
9	 Civil Law (Part I) Definition and nature Civil law relationship Subject of civil law Property and ownership Civil transactions 	1-5 (Level R - reinfor ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPT- Civil law available on Blackboard Civil code 2015 available on Blackboard
10	 Civil Law (Part II) Contracts Definitions Formation of contracts Validity of contracts Liability for breach of contracts 	1-5 (Level M - Master y)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPT- Civil law available on Blackboard Civil code 2015

]	arrailabla
	Civil Law (Part III) • Inheritance - Testamentary inheritance - Intestacy	1-5 (Level M - Master y)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	available on Blackboard PPT- Civil law available on Blackboard Civil code 2015 available on Blackboard
12	 Law on Enterprises Introduction to law on enterprises Introduction to forms, features, establishment, reorganization and dissolution of an enterprise 	1-5 (Level I - Introdu ced)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPT- Law on enterprises available on Blackboard Law on enterprises 2020 available on Blackboard
13	 Labor Law Definition, and nature of labour law Employees and employers Working time, and resting time Salary (including salary for overtime working hours) 	1-5 (Level M - Master y)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPT– Labor law available on Blackboard Labor code 2019 available on Blackboard
14	 Labour Law (Cont.) Employment contracts Labor disciplines Dispute settlements 	1-5 (Level M - Master y)	Tests Peer evaluations Class- performance evaluations	Discussi ons Case studies	PPT– Labor law available on Blackboard Labor code 2019 available

			on Blackboard
15	Revision/ Tutoring classes	Quizzes Projects	

4. Assessment plan

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

Note: %Pass: Target that % of students having scores greater than 50 out of 100. 5. Rubrics

No ·	CL Os	Criteri a	COMPL ETELY FAIL Below 30%	INADEQUA TE 30% – 49%	ADEQUA TE 50% - 69%	ABOVE AVERAGE 70% - 89%	EXEM PLARY ≥90%
1	CL O 1	Organi sation and clarific ation	No evidence of organiza tion and coherenc e	Does not organise ideas logically and with clarification Limited evidence of coherence Ideas lack consistence	Generally organised logically, with evidence of progressio n Occasional ly, there may be a lack of focus or ideas may be tangential	Clear organizatio n and progression Responds appropriatel y and relevantly, although some ideas are underdevel oped	Respon se is focused, detailed and non- tangenti al. Shows a high degree of attentio n to logic and reasoni ng of points. Clearly leads the reader

2	Origin ality and usefuln ess of the analysi s	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	to the conclusi on and stirs thought regardin g the topic Shows strong ability to identify legal issues, gather the facts and develop claims as well as link claims with evidenc e. Satisfac tory solution s are offered and
						support ed
3	Use of data/in formati on	Shows no effort to incorpor ate informat ion from primary and secondar y sources	Shows little information from sources. Poor handling of sources	Shows moderate amount of source informatio n incorporate d. Some key points supported by sources.	Draws upon sources to support most points. Some evidence may not support arguments or may	Draws upon primary and seconda ry source informa tion in useful and illumina ting

					Quotations may be poorly integrated into paragraphs Some possible problems with source citations	appear where inappropria te. Quotations integrated well into paragraphs. Sources cited correctly	ways to support key points. Excelle nt integrati on of quoted material into paragra phs. Source cited correctl y
4	CL O2	Use of framew orks	Shows no effort to structure problem s in correspo ndence to theoretic al framewo rks	Shows limited ability to structure problems in corresponden ce to theoretical frameworks	Shows effort to link problems with the theoretical framework s. There are still some mistakes	Shows ability to structure problems in correspond ence to theoretical frameworks correctly. Minor mistakes in resolving problems	Shows ability to structur e problem s in corresp ondence to theoreti cal framew orks correctl y. The problem s are well resolve d
5	1	Quality of argume nts	Shows no effort to construc t logical argumen ts.	Shows little attempt to offer support for key claims or to relate	Shows argument of poor quality. Weak, undevelop ed reasons	Shows clear, relevant and logical arguments.	Shows identifia ble, reasona ble and sound

	Fails to	evidence to	are offered	argume
	analysis	Reasons offered are	key claims	Clear reasons
		irrelevant.		are offered
				to support
				key claims.

Course Name: Lịch sử Đảng Cộng sản Việt Nam (History of Vietnamese communist party)

Course Code: PE018IU

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 sổ môn học:	PE018IU
Thuộc khối kiến thức:	CƠ SỞ
Số tín chỉ:	2
Số tiết ỉý thuyết:	20 (trên lớp)
Số tiết thực hành:	10 (trên lớp)
Số tiết tự học:	90 (về nhà)
Môn học trước:	 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 để 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 sừ 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 đốivới 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.

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 VÀPHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM	LO. 1.1 - Nắm 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	LO.2.1 - Nắm được bối cảnh lịch sử tác động đến sự ra đời của Đảng Cộng sản Việt Nam	2.1	1.1.3	T4

LÃNH ĐẠO ĐÂU TRANH GIÀNH CHÍNH QUYỀN (1930-	LO.2.2 - Nắm được quá trình chuẩn bị các điều kiện để thành lập Đảng của Nguyễn Ái Quốc	2.1	
1945)	LO.2.3- Nắm 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 sàn Việt Nam	2.1	
	LO.2.5 - Nắm rõ các phong trào cách mạng 1930-1935 và các chủ trương khôi phục phong trào năm 1932-1935	2.1	
	LO.2.6 - Nắm rõ phong trào dân chủ năm 1936-1939 LO.2.7 - Nắm rõ phong trào giải phóng dân tộc 1939 1945	2.1	
	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 ĐẦT NƯỚC (1945-1975)	LO.3.1 - Hiểu được chủ trương xây dựng và bảo vệ chính quyền cách mạng 1945-1946 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
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	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 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	2.1	1.1.3	T4
	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	2.1		

LO.4	ĐẢNG LÃNH ĐẠO CẢ NƯỚC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIÊN HẢNH CÔNG CUỘC ĐỐI 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 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 LO.4.4 - Nắm rõ thành tựu, kinh nghiệm của công cuộc đổi mới 	2.1 2.2	1.1.3	T4
		LO.4.5 - Hiểu rõ những thắng lợi vĩ đại của cách mạng Việt Nam dưới sự lãnh đạo của Đảng từ năm 1930 đến 2018	2.1		
			2.2		

		LO.4.6 - Hiểu rõ những bài học lớn về sự lãnh đạo của Đảng từ năm 1930 đến 2018			
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5.2. Kỹ năng

LO.5 5.3. Thái đô	THẾ HIỆN KHẢ NĂNG KHẢI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.5.1. Rèn luyện năng lực tư duy độc lập trong nghiên cứu đường lối, chiến lược, sách lược cách mạng của Đảng. 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 phán luật của Đảng	2.1 2.2 2.3	2.1.1 2.3.1 2.4.4 2.5 3.1.5	U4
LO.6	THẾ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	LO.6.1. Tin tưởng vào sự lãnh đạo của Đảng đối với cách mạng Việt Nam. LO.6.2. Quyết tâm phấn đấu thực hiện đường lối cách mạng của Đảng. 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	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; | Dạy: Giới thiệu đề cương môn học Giới thiệu nội dung đề tài thuyết trình nhóm GHW) Học ở lớp: Chia nhóm (5 SV/nhóm) | |
| | | | Dạy: | Thi |
| | Chương nhập môn
ĐỐI TƯỢNG,
CHỨC NĂNG,
NHIỆM VỤ, NỘI
DUNG VÀ | | I. ĐỐI TƯỢNG NGHIÊN CỨU
CỦA MÔN HỌC LỊCH SỬ
ĐẢNG CỘNG SẢN VIỆT NAM 1. Đối tượng nghiên cứu 2. Phạm vi nghiên cửu | giữa
kỳ
(Quiz
) |
| 2
PHƯƠNG H
NGHIÊN C
HỌC TẬP I
SỪ ĐẢNG C
SẢN VII
NAM | PHƯƠNG PHÁP
NGHIÊN CỨU,
HỌC TẬP LỊCH
SỪ ĐẢNG CỘNG
SẢN VIỆT
NAM | LO.1; | 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
II.PHƯƠNG PHÁP NGHIÊN
CỨU HỌC TÂD MÔN HICH SỬ
Day: | |
| 3 | Chương 1
ĐẢNG CỘNG
SẢN VIỆT NAM
RA ĐỜI VÀ
LÃNH ĐẠO ĐẦU
TRANH GIÀNH
CHÍNH QUYỀN
(1930-1945) | LO.2 | 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 chuấn 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 ĐẦU
TRANH GIÀNH CHÍNH
QUYỀN (1930-1945) | Thi
giữa
kỳ
(Qui
z)
Thi
cuối
kỳ
(FE
X) |

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	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 (Discussi on 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, điếm 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;
			Tổng cộng	100%		

8. Tiêu chí đánh giá chuẩn đầu ra môn học

ТТ	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 đanh 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.

Course Name: Entrepreneurship

Course Code: IT120IU

1. General information

Course designation	An introduction to the creative and innovative managerial practices of successful entrepreneurship.
Semester(s) in which the course is taught	7
Person responsible for the course	MSc. Dao Tran Hoang Chau
Language	English
Relation to curriculum	Compulsory (CS, NE, CE) Elective (DS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Total workload: 135 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) Private study including examination preparation, specified in hours: 90
Credit points	Number of credits : 3 Lecture: 3 Laboratory: 0
Required and recommended prerequisites for joining the course	
Course objectives	This course reviews the significant economic and social contributions entrepreneurs provide to society, the intense lifestyle commitment, and the skills necessary for entrepreneurial success. It explores how to identify and develop solutions to the most common leadership and personal challenges faced by entrepreneurs when starting new ventures or launching new products. It also promotes a deeper understanding of what is required to be a successful entrepreneur, highlights the skills and tools necessary to start a new business and explores alternatives to common pitfalls. This course applies entrepreneurial marketing approaches used by successful entrepreneurs. These include utilizing industry sector trends, identifying emerging customer niches, developing new products/services, using guerilla marketing strategies, and Internet and social marketing strategies. It emphasizes the importance of managing cash flows, ratio analysis, pro forma development, and the basics of deal structure and harvesting a business venture. Students will identify and

	interpret sources of information from company financial reports, financial publications, industry benchmarks, the media, and web sites. An introduction to the process of researching, writing, and presenting a business plan. Students identify and screen ideas using a business feasibility study that describes the product features, market opportunity, customer profile, sales forecast, competitive advantage, and profit potential. Following a successful feasibility study, students may use business plan software as each develops their own complete business plan.					
Course learning) 2 Apply new techn	ology to boost busines	s perform	ance.	
oucomes	CLC) 3. Manage marketir	ng strategy and financia	al statemer	nts in	1 a
	ente	rprise;				
		Competency level	Course learning out	come (CL	(O)	
		Knowledge	1, 2, 3			
		Skill	1, 3			
		Attitude	3			
Content	The weig Wei Tea	<i>description of the con</i> <i>ghting of the content of</i> <i>ght: lecture session (</i> <i>ching levels: I (Introc</i>	<i>ntents should clearly in and the level.</i> 3 hours) luce); T (Teach); U (U	ndicate the tilize)	!	
	То	pic		Weight	Lev	vel
	En	trepreneurship, Creat	ivity and Innovation;	3	Ι, Τ	1
	Cre	eative Problem Solvin	ng Model;	3	Т, Т	U
	De Pro	velop a Product. Gen otect Inventions;	erate Ideas and	2	Т	
	Ma	rketing Strategies;		3	Т, Т	U
	Fir	ance and Accounting	5	4	Т, Т	U
Examination forms	Mul	tiple-choice question	s, short-answer questic	ons	<u> </u>	
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.	Duening & Hisrich Entrepreneurship 2	& Lechter, Technolog nd, 2014	SY.		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6

1		X		
2	X			
3			X	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Entrepreneurship, Creativity and Innovation;	1	Midterm exam	Lecture, In- class activities, Ouiz	
2	Creative Problem Solving Model;	1	Midterm exam	Lecture, In- class activities, Quiz	
3	Develop a Product. Generate Ideas and Protect Inventions;	2	Midterm exam, Assignment	Lecture, In- class activities, Project	
4	Midterm				
5	Marketing Strategies;	3	Final exam, Assignment	Lecture, Project	
6	Finance and Accounting	3	Final exam, Assignment	Lecture, Project	
7	Final exam				

4. Assessment plan

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

Assessment Type	CLO1	CLO2	CLO3
Midterm examination (25%)	50%	50%	
Projects/Presentations/ Report (25%)			60%
Final examination (40%)			40%
Exercises/ Quiz (10%)	50%	50%	

Rubrics (optional)

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	10				
principal content					
Introduction demonstrates thorough knowledge of	15				
relevant background and prior work					
Analysis and discussion demonstrate good subject	30				
mastery					
Summary and conclusions appropriate and complete	5				
Organization (10%)					
Distinct introduction, body, conclusions	5				
Content clearly and logically organized, good	5				
transitions					
Presentation (20%)					
Correct spelling, grammar, and syntax	10				
Clear and easy to read	10				
Quality of Layout and Graphics (10%)	10				
TOTAL SCORE	100				

2. Holistic rubric

Holi	stic 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.

3. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milest	Milestone	
	4	3 2		1
	Issue/ problem	Issue/ problem	Issue/	Issue/
	to be considered	to be considered	problem to	problem to be
	critically is	critically is	be	considered
Explanation of	stated clearly	stated,	considered	critically is
issues	and described	described, and	critically is	stated without

	comprehensivel	clarified so that	stated but	clarification
	y, delivering all	understanding is	description	or
	relevant	not seriously	leaves some	description.
	information	impeded by	terms	1
	necessary for	omissions.	undefined,	
	full		ambiguities	
	understanding.		unexplored,	
	C		boundaries	
			undetermine	
			d, and/ or	
			backgrounds	
			unknown.	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Evidence	comprehensive	coherent	synthesis.	interpretation/
Selecting and	analysis or	analysis or	Viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	Viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	~1
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'	11	position.	assertions as
	assumptions	identifies own	way be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others	identify some
Influence of	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.

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

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	Benchmark	
	4	3 2		1
	Organizational	Organizational	Organizational	Organizational
	pattern	pattern	pattern	pattern (specific
	(specific	(specific	(specific	introduction and
Organization	introduction	introduction	introduction	conclusion,

	and conclusion,	and conclusion,	and conclusion,	sequenced
	sequenced	sequenced	sequenced	material within
	material within	material within	material within	the body, and
	the body, and	the body, and	the body, and	transitions) is not
	transitions) is	transitions) is	transitions) is	observable
	clearly and	clearly and	intermittently	within the
	consistently	consistently	observable	presentation.
	observable and	observable	within the	1
	is skillful and	within the	presentation.	
	makes the	presentation.	1	
	content of the	-		
	presentation			
	cohesive.			
	Language			
	choices are			
	imaginative,		Language	
	memorable,	Language	choices are	
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
	Delivery			
	techniques	Delivery	Delivery	5.1
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eye contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	datraat from the
	compelling	make the	make the	uetract from the
	and speaker	interesting and	understandable	of the
	and speaker	speaker	and speaker	presentation and
	polished and	annears	annears	speaker appears
Deliverv	confident.	comfortable	tentative	uncomfortable
j	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations.	(explanations.	materials
	materials	examples.	examples.	(explanations,
Supporting	(explanations,	illustrations.	illustrations.	examples,
Material	examples,	statistics,	statistics,	illustrations,

	illustrations,	analogies,	analogies,	statistics,
	statistics,	quotations	quotations	analogies,
	analogies,	from relevant	from relevant	quotations from
	quotations	authorities)	authorities)	relevant
	from relevant	make	make	authorities)
	authorities)	appropriate	appropriate	make reference
	make	reference to	reference to	to information or
	appropriate	information or	information or	analysis that
	reference to	analysis that	analysis that	minimally
	information or	generally	partially	supports the
	analysis that	supports the	supports the	presentation or
	significantly	presentation or	presentation or	establishes the
	supports the	establishes the	establishes the	presenter's
	presentation or	presenter's	presenter's	credibility/
	establishes the	credibility/	credibility/	authority on the
	presenter's	authority on	authority on	topic.
	credibility/	the topic.	the topic.	
	authority on			
	the topic.			
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable,	consistent with	but is not often	explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Special Study of the Field

Course Code: IT083IU

1. General information

Course designation	This course helps students to do a research topic and prepare for a thesis			
Semester(s) in which the course is taught	7			
Person responsible for the course	Lecturers (thesis adviso	pr)		
Language	English			
Relation to curriculum	Compulsory			
Teaching methods	Lecture, lesson, project	, seminar.		
Workload (incl. contact hours, self- study hours)	(Total workload: 90 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours: 90			
Credit points	Number of credits : 3 Lecture: 0 Laboratory: 3			
Required and recommended prerequisites for joining the course	Required number of credits, Internship			
Course objectives	Students are advised to select a subject under the guidance of a faculty member. Project content might be a research topic or building a new application that underlies the graduation thesis. Research topics include fields of academic program that are academic or practical.			
Course learning outcomes	CLO 1. Research a specific topic in the field.CLO 2. Design the model or system architecture of the application productCLO 3. Have a good preparation to develop and improve the product in the thesis.			
	Competency leve	Course learning outcome (CLO)		
	Knowledge	CLO1		
	Skill	CLO1, CLO2		
	Attitude	CLO3		

Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: in the whole semester.						
	Teaching levels: I (Introduce); T (Teach); U (U	tilize) Woight	Lovol				
	3	U					
	Review and evaluate existing issues/problems	8	U				
	Research and propose some solutions 8						
	Deploy some main functions or new features for the product project						
	Testing and evaluating solutions or products	8	U				
	Write a report	10	U				
Examination forms	Multiple-choice questions, short-answer questions						
Study and	Attendance: A minimum attendance of 80 perc	ent is com	pulsory				
examination	for the appointments with lecturer. Students wi	ll be asses	sed on				
requirements	the basis of their class participation. Questions and comments are strongly encouraged.						
Assignments/Tasks: Students must have more than 50/1 overall to pass this course.							
Reading list	Related works and books						

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1		Х				
2		Х				Χ
3			Х			

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning	Resources
				activities	
1	Find out the topic of	1,2	Check and	Discuss and	Related work,
	the subject		Evaluate	Research	books and
	-				research papers
2	Review and evaluate	1,2	Check and	Discuss and	Related work,
	existing issues		Evaluate	Research	books and
	C C				research papers
4	Research and	1,2	Check and	Discuss and	Related work,
	propose some		Evaluate	Research	books and
	solutions				research papers

5	Deploy some main functions or new features for the product project	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
6	Testing and evaluating solutions or products	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
7	Write a report	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
8	Final grade				

4. Assessment <u>plan</u>

Assessment Type	CLO1	CLO2	CLO3
Final grade (100%)	30%	40%	30%

Note: %Pass: Target that % of students having scores greater than 60 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

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

01-	
Holi	stic 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

5.2. Holistic rubric

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	Milest	one	Benchmark
	4	3	2	1
	Issue/ problem to be considered critically is stated clearly and described comprehensivel	Issue/ problem to be considered critically is stated,	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities	Issue/ problem to be
	y, delivering all relevant information necessary for	described, and clarified so that understanding is not seriously	unexplored, boundaries undetermine d, and/ or	considered critically is stated without clarification
Explanation of issues	full understanding.	impeded by omissions	backgrounds	or description.
100400	Information is taken from source(s) with	Information is taken from source(s) with	Information is taken from source(s)	Information is taken from
Evidence	enough	enough	with some	source(s)
Selecting and	interpretation/	interpretation/	interpretation	without any
using	evaluation to	evaluation to	/ evaluation,	interpretation/
information to	develop a	develop a	but not	evaluation.
investigate a	comprehensive	coherent	enough to	Viewpoints of
point of view or conclusion	analysis or synthesis.	analysis or synthesis.	develop a coherent	experts are taken as fact,

	Viewpoints of	Viewpoints of	analysis or	without
	experts are	experts are	synthesis.	question.
	questioned	subject to	Viewpoints	1
	thoroughly.	questioning.	of experts are	
			taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific			
	position			
	(perspective,			
	hypothesis) is			
	imaginative			
	taking into			
	account the	Specific		
	complexities of	position		
	an issue I imits	(nerspective		
	of position	thesis/hypothesi		
	(perspective.	s) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.

			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Oral communication value rudric for evaluating presentation tast	Oral	ral comm	unication	value	rubric	for	evaluating	presentation	tasks
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	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable,	generally	commonplace	minimally
	and	support the	and partially	support the
	compelling,	effectiveness	support the	effectiveness of
	and enhance	of the	effectiveness of	the presentation.
	the	presentation.	the	Language in
Language	effectiveness	Language in	presentation.	presentation is

	1	1	1	
	of the	presentation is	Language in	not appropriate
	presentation.	appropriate to	presentation is	to audience.
	Language in	audience.	appropriate to	
	presentation is		audience.	
	appropriate to			
	audience.			
	Deliverv			
	techniques	Delivery	Deliverv	
	(posture	techniques	techniques	Delivery
	gesture eve	(posture	(posture	techniques
	contact and	gesture eve	gesture eve	(posture gesture
	vocal	gesture, eye	gesture, eye	(posture, gesture,
	vocal			eye contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies.	analogies.	analogies.	illustrations,
	quotations	quotations	quotations	statistics.
	from relevant	from relevant	from relevant	analogies.
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	nartially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	nrecenter's	nrecenter's	nrecenter's	nrecenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Supporting	the terric	the terric	the terric	tonio
wiaterial	Control	Control	Control	Control
Contral	Central .	Central .	Central .	Central message
Central	message is	message is	message is	can be deduced
Message	compelling	clear and	basically	but 1s not

(pr	recisely	consistent with	understandable	explicitly stated
stat	ted,	the supporting	but is not often	in the
app	propriately	material.	repeated and is	presentation.
rep	beated,		not memorable.	
me	emorable,			
and	d strongly			
sup	oported.)			

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Thesis

Course Code: IT058IU

1. General information

Course designation	This course evaluates students obtained knowledges to complete the academic program
Semester(s) in which the course is taught	8
Person responsible for the course	Lecturers (thesis advisor)
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Contact hours: 300 hours Private study including examination preparation, specified in hours: 300
Credit points	Number of credits : 10 Lecture: 0 Laboratory: 10
Required and recommended prerequisites for joining the course	Required number of credits Special Study of the Field
Course objectives	Dissertations are industrial projects designed to ensure that students have mastered their subjects in the program. All projects are based on "real projects" provided by the industry to students to develop skills and apply knowledge gained from all courses throughout the program. Students will work independently to develop requirements, design, implement and provide solutions to business problems. Students can follow any appropriate process model, must self-manage the project, follow all appropriate project management techniques. The success of the project is largely determined by whether the student adequately solves the client's problem. Students will provide the final product with all artifacts that match the process model being used (e.g. project plan, technical requirements, system architecture, design documentation, test plan, source code and installed software products).
Course learning outcomes	CLO 1. Research a specific topic in the field. CLO 2. Design the model or system architecture of the application product

	CLO 3. Hard work to develop and finish the product of the thesis.					
	Competency level	Course learning out	tcome (CI	L O)		
	Knowledge	CLO1				
	Skill	CLO1, CLO2				
	Attitude	CLO3				
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: in the whole last semester Teaching levels: I (Introduce); T (Teach); U (Utilize)					
	TopicWeightLevel					
	Find out the thesis topic	4	U			
	Review and evaluate ex	20	U			
	Research and propose se	30	U			
	Deploy the thesis produ	40	U			
	Testing and evaluating solutions or products			U		
	Thesis defense	esis defense		U		
Examination forms	Multiple-choice question	s, short-answer questi	ons			
Study and	Attendance: A minimum	attendance of 80 perc	ent is con	npulsory		
examination	for the class sessions. Stu	idents will be assessed	l on the ba	isis of		
requirements	their class participation. (Questions and comme	nts are str	ongly		
	encouraged.					
	Assignments/Examinatio	n: Students must have	e more tha	n		
D 1' 1' /	50/100 points overall to p	bass this course.				
Keading list						

2. Learning Outcomes Matrix

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

	SLO					
CLO	1	2	3	4	5	6
1	Х	Х				
2	Х	Х				Χ
3			Х			

3. Planned learning activities and teaching methods

1	Find out the thesis topic	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
2	Review and evaluate existing issues	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
4	Research and propose some solutions	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
5	Deploy the thesis product	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
6	Testing and evaluating solutions or products	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
7	Thesis defense	1,2,3	By committee	presentation	
8	Final grade				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Final grade (100%)	30%	40%	30%

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:	•••••			
	Evalu	ator:		
	•••••			
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
Summary and conclusions appropriate and complete	5			
Organization (10%)				
Distinct introduction, body, conclusions	5			

Content clearly and logically organized, good	5	
transitions		
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

Holis	stic 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
	4 Issue/ problem to be considered critically is stated clearly and described comprehensivel y, delivering all relevant information	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermine	Issue/ problem to be considered critically is stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.

			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation	
	source(s) with	source(s) with	but not	
	source(s) with	source(s) with	on ouch to	Information is
	enougn	enougn		Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Evidence	comprehensive	coherent	synthesis.	interpretation/
Selecting and	analysis or	analysis or	Viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	Viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact.
point of view or	questioned	subject to	with little	without
conclusion	thoroughly	questioning	questioning	question
conclusion	unorouginy.	questioning.	Questions	question.
			Questions	
			some	C1
			assumptions.	Snows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	then one's	when
innuence of				when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific	Specific		
	position	position		
	(perspective,	(perspective,		
	thesis/	thesis/hypothesi		
	hypothesis) is	s) takes into	Specific	
	imaginative,	account the	position	Specific
	taking into	complexities of	(perspective,	position
	account the	an issue. Others'	thesis/	(perspective,
Student's	complexities of	points of view	hypothesis)	thesis/
position	an issue. Limits	are	acknowledge	hypothesis) is
(nerspective.	of position	acknowledged	s different	stated but is
thesis/hynothesi	(nerspective	within position	sides of an	simplistic and
s)	thesis/	(perspective	issue	obvious
· ~/		weise weise,		

	hypothesis) are	thesis/		
	acknowledged.	hypothesis).		
	Others' points of			
	view are			
	synthesized			
	within position			
	(perspective,			
	thesis/			
	hypothesis).			
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.

	Language			
	choices are		т	
	imaginative,	-	Language	
	memorable,	Language	choices are	
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	affactiveness of
	or the	progentation	nrecentation	the presentation
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.
	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eye contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling	presentation	presentation	understandability
	and speaker	interesting and	understandable	of the
	annears	sneaker	and speaker	presentation and
	nolished and	appears	and speaker	speaker appears
Dolivory	confident	appears	tentetive	uncomfortable
Denvery	A voriety of	Sumporting	Sumporting	Incontinionable.
	A variety of	Supporting	Supporting	insumcient
	types of	materials	materials	supporting
	supporting	(explanations,	(explanations,	materials
	materials	examples,	examples,	(explanations,
	(explanations,	illustrations,	illustrations,	examples,
	examples,	statistics,	statistics,	illustrations,
	illustrations,	analogies,	analogies,	statistics,
	statistics,	quotations	quotations	analogies,
	analogies,	from relevant	from relevant	quotations from
	quotations	authorities)	authorities)	relevant
	from relevant	make	make	authorities)
	authorities)	appropriate	appropriate	make reference
	make	reference to	reference to	to information or
	appropriate	information or	information or	analysis that
	reference to	analysis that	analysis that	minimally
	information or	generally	partially	supports the
			1	11
	analysis that	supports the	supports the	presentation or
Supporting	analysis that significantly	supports the presentation or	supports the presentation or	presentation or establishes the

	presentation or establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	credibility/ authority on the topic.
	Central message is compelling (precisely stated, appropriately repeated, memorable,	Central message is clear and consistent with	Central message is basically understandable but is not often	Central message can be deduced but is not explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

science Month 2

Assoc.Prof. Nguyen Van Sinh

Course Name: Special Study of the Field 2

Course Code: IT168IU

1. General information

Course	This ad	dvanced course buil	ds upon the concepts learned in th	e
designation	"Speci	al Study of the Field	d" course and guides students in	
	conduc	cting more advanced	l research. The course is designed	to
	develo	p students' research	, analysis, and presentation skills.	
Semester(s) in	8			
which the course				
is taught				
Person	Lectur	ers (thesis advisor)		
responsible for the		· · · · · · · · · · · · · · · · · · ·		
course				
Language	Englis	h		
Relation to	Compu	ulsory		
curriculum	1	2		
Teaching methods	Lectur	e, lesson, project, se	eminar.	
Workload (incl.	(Total	workload: 90 hours		
contact hours,	Contact hours (laboratory session): 5			
self-study hours)	Private study including examination preparation, specified in			
	hours: 85			
Credit points	Number of credits: 3			
	Lectur	e: 0		
	Labora	atory: 3		
Required and	Specia	l Study of the Field		
recommended				
prerequisites for				
joining the course				
Course objectives	This co	ourse allows student	s to select a subject under faculty	
	guidan	ce. Projects allow s	tudents to delve into advanced res	earch
	and pr	actical applications	within their field of study, offering	g an
	alterna	tive to the traditionation	al thesis. Students will develop in-	depth
	knowle	edge and skills whil	e focusing on a specific topic of th	neir
	choice			
Course learning	CLO 1	. Analyze and synth	esize advanced topics within the f	field.
outcomes	CLO 2	. Design and implei	nent complex system architecture	s for
	application products.			
	CLO 3. Develop a comprehensive strategy to enhance and			
	optimi	ze the product in the	e project.	
		Competency	Course learning outcome	
		level	(CLO)	

		Knowledge	CLO1		
		Skill	CLO1, CLO2		
		Attitude	CLO3		-
Content	The de	scription of the con	tents should clearly indi	cate the	
	weight	ing of the content a	nd the level.		
	Weigh	t: in the whole seme	ester.		
	Teachi	ng levels: I (Introdu	uce); T (Teach); U (Utili	ze)	
	Торіс	2		Weigh	Leve
				t	1
	Adva: techn	nced research meth iques	odologies and	5	U
	In-dep propo	depth problem analysis and solution			U
	Adva	Advanced system design and implementation		15	U
	Integration of cutting-edge technologies		10	U	
	Performance optimization and testing			10	U
	Comp	prehensive project d	levelopment	20	U
	Write	a report and Project	et presentation	30	U
Examination forms	Short/l	ong-answer questic	ons		
Study and examination	Attend for the	ance: A minimum a appointments with	attendance of 80 percent lecturer. Students will b	is compu e assesse	llsory d on
requirements	the bas	sis of their class par	ticipation. Questions and	d commer	nts are
	strong	ly encouraged.			
	Assignments/Tasks: Students must have more than 50/100 points overall to pass this course.				
Reading list	Relate	d works and books			
-	Advan	ced research papers	s, academic journals, and	l industry	
	publica	ations.			

2. Learning Outcomes Matrix

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

	SL O					
CL	1	2	3	4	5	6
0						
1	Х					
2		Х				Х
3			Χ			

Wee k	Торіс	CL O	Assessments	Learning activities	Resources
1	Advanced research methodologies and techniques	1	Check and Evaluate	Discuss and Research	Related work, books and research papers
2	In-depth problem analysis and solution proposal	1,2	Check and Evaluate	Discuss and Research	Related work, books and research papers
4	Advanced system design and implementation	2	Check and Evaluate	Discuss and Research	Related work, books and research papers
5	Integration of cutting- edge technologies	2	Check and Evaluate	Discuss and Research	Related work, books and research papers
6	Performance optimization and testing	2	Check and Evaluate	Discuss and Research	Related work, books and research papers
7	Comprehensive project development	3	Check and Evaluate	Discuss and Research	Related work, books and research papers
8	Project presentation	3	Check and Evaluate	Discuss and Research	Related work, books and research papers

3. Planned learning activities and teaching methods

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Final grade (100%)	30%	40%	30%

Note: %Pass: Target that % of students having scores greater than 60 out of 100.

5. Rubrics (optional)

5.1. Grading checklist

Grading checklist for Written Reports				
Student: HW/Assignme	ent:		• • • • • • •	
Date: Evaluator:	•••••			
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				

Summary and conclusions appropriate and complete	5	
Organization (10%)		
Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
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

H	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	Miles	tone	Benchmark
	4	3	2	1
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	
	critically is stated	to be considered	terms	
	clearly and	critically is	undefined,	Issue/
	described	stated,	ambiguities	problem to be
	comprehensively,	described, and	unexplored,	considered
	delivering all	clarified so that	boundaries	critically is
	relevant	understanding is	undetermined,	stated without
	information	not seriously	and/ or	clarification
Explanation	necessary for full	impeded by	backgrounds	or
of issues	understanding.	omissions.	unknown.	description.

Evidence Selecting and using	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of	Information is taken from source(s) without any interpretation/ evaluation.
information	synthesis.	synthesis.	experts are	Viewpoints of
to investigate	Viewpoints of	Viewpoints of	taken as	experts are
a point of	experts are	experts are	mostly fact,	taken as fact,
view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
Influence of context and	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a	Identifies own and others' assumptions and several relevant contexts when presenting a	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a
assumptions	position.	position.	(or vice versa).	position.
	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of	Specific position (perspective, thesis/hypothesi s) takes into account the complexities of	G	
	position	an issue. Others'	Specific	Specific
Student's	(perspective, thesis/hypothesis)	points of view	position	position
nosition	are acknowledged	acknowledged	thesis/	thesis/
(nersnective	Others' points of	within position	hypothesis)	hypothesis) is
perspective	view are	(nerspective	acknowledges	stated but is
, thesis/hynot	synthesized within	thesis/	different sides	simplistic and
hesis)	position	hypothesis).	of an issue.	obvious.

	(perspective, thesis/ hypothesis).			
		Conclusion is	Conclusion is logically tied	Conclusion is
	Conclusions and	logically fied to	to information	inconsistently
	related outcomes	information.	information is	of the
	(consequences and	including	chosen to fit	information
	implications) are	opposing	the desired	discussed;
	logical and reflect	viewpoints;	conclusion);	related
Conclusions	student's informed	related	some related	outcomes
and related	evaluation and	outcomes	outcomes	(consequence
outcomes	ability to place	(consequences	(consequences	s and
(implication	evidence and	and	and	implications)
s and	perspectives	implications)	implications)	are
consequence	discussed in	are identified	are identified	oversimplifie
s)	priority order.	clearly.	clearly.	d.

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is
	content of the	observable	observable	not observable
Organizatio	presentation	within the	within the	within the
n	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable, and	generally	commonplace	minimally
Language	compelling, and	support the	and partially	support the

Oral communication	value rubric for	or evaluating _E	presentation tasks:

	enhance the	effectiveness of	support the	effectiveness of
	effectiveness of	the	effectiveness of	the presentation.
	the presentation.	presentation.	the	Language in
	Language in	Language in	presentation.	presentation is
	presentation is	presentation is	Language in	not appropriate
	appropriate to	appropriate to	presentation is	to audience.
	audience.	audience.	appropriate to	
	uuurente et		audience.	
	Delivery		Delivery	Delivery
	techniques	Delivery	techniques	techniques
	(posture,	techniques	(posture,	(posture,
	gesture, eve	(posture.	gesture, eve	gesture, eve
	contact, and	gesture. eve	contact, and	contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandabilit
	compelling, and	presentation	understandable.	v of the
	speaker appears	interesting and	and speaker	presentation, and
	polished and	speaker appears	appears	speaker appears
Delivery	confident	comfortable	tentative	uncomfortable
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations.	(explanations.	(explanations.	supporting
	examples	examples	examples	materials
	illustrations	illustrations	illustrations	(explanations
	statistics	statistics	statistics	examples
	analogies	analogies	analogies	illustrations
	quotations from	quotations from	quotations from	statistics
	relevant	relevant	relevant	analogies
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	nartially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	nresenter's	nresenter's	nresenter's	nresenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
- Sakhor ung	a autority off the	autionity off the	additionity off the	additing off the
Material	topic.	topic	topic	topic

	Central message			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable, and	consistent with	but is not often	explicitly stated
Central	strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Т

science Work

Assoc.Prof. Nguyen Van Sinh

Course Name: Data Mining

Course Code: IT160IU

1. General information

Course designation	This subject introduces the students to the principles and algorithms of data mining, and the requirements of a data mining process.					
Semester(s) in which the course is taught	6,8					
Person responsible for the course	Dr. Nguyen Thi Thanh Sang					
Language	English					
Relation to curriculum	Elective (CS, NE, CE) Compulsory (DS)					
Teaching methods Workload (incl. contact hours, self- study hours)	Lecture, lesson, project, laboratory. (Estimated) Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120					
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1					
Required and recommended prerequisites for joining the course	Object-Oriented Programming					
Course objectives	Students will study data mining concepts and algorithms to solve problems of knowledge discovery. They will be equipped with skills of using recent data mining software for solving practical problems and gain experience of doing independent study and research.					
Course learning						
outcomes	Competency level	Course learning outcome (CLO)				
	Knowledge	CLO 1. Understand basic contents of data warehousing and data mining. CLO 2. Explain modern algorithms in the area of data mining and knowledge discovery.				
	Skill	CLO 3. Apply data mining techniques to some case studies using existing datasets.				
	Attitude	CLO 4. Work in a team to b mining process.	ouild a dat	a		
--	---	---	-------------	------	--	--
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)					
	TopicWeightLevel					
	Introduction to I	Data Mining	1	Ι		
	Know your data		1	T, U		
	Data preprocessi	ng	1	T, U		
	Data mining kno	wledge representation	1	T, U		
	Evaluating what	's been learned	1	Т		
	Data mining algo	orithms: Classification	2	T, U		
	Mining Frequent Patterns, Association and Correlations: Basic Concept and Methods2T					
	Data mining algo	orithms: Clustering	2	Т		
	Classification: A	1	T, I			
	Semantic data m	1	Ι			
Examination forms	Multiple-choice q	Multiple-choice questions, short-answer 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	 50/100 points overall to pass this course. [1] Jiawei Han, Micheline Kamber, <i>Data Mining: Concepts and Techniques</i>, 3rd Edition, 2011. [2] Ian H.Witten, Eibe Frank, Mark A. Hall, and Christopher J. Pal, <i>Data Mining: Practical Machine Learning Tools and Techniques</i>, Fourth Edition, Morgan Kaufmann, 2016. [3] A. Lawrynowicz, <i>Semantic Data Mining: An Ontology-based Approach (Studies on the Semantic Web)</i>, IOS Press 					

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	X					

2	х			
3				x
4			X	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to Data Mining	1		Lecture, Discussion	[1, 2]. Chapter 1
2	Know your data	1	Quiz.s2	Lecture, In-class quiz	[1]. Chapter 2
3	Data preprocessing	1,4		Lecture, Discussion	[1]. Chapter 3
4	Data mining knowledge representation	1	Quiz.s4	Lecture, In-class quiz	[2]. Chapter 3; Reading [1]. Chapter 4 – Data Warehousing
5	Evaluating what's been learned	1	Quiz.s5	Lecture, In-class quiz	[2]. Chapter 5
6-7	Data mining algorithms: Classification	2,3	Quiz.s6-7	Lecture, In-class quiz	[1]. Chapter 8; [2]. Chapter 4.3
8	Data mining to code	3		Lecture, Discussion	
9	Midterm				
10-11	Mining Frequent Patterns, Association and Correlations: Basic Concept and Methods	2,3,4	Quiz.s10-11	Lecture, In-class quiz	[1]. Chapter 6; [2]. Chapter 4.5
12-13	Data mining algorithms: Clustering	2,3,4	Quiz.s12-13	Lecture, In-class quiz	[1]. Chapter 10; [2]. Chapter 4.8
14	Classification: Advanced Methods	2	Quiz.s14	Lecture, In-class quiz	[1]. Chapter 9
15	Semantic data mining	2		Lecture, Discussion	[3]
16	Revision			Review- test	
17	Final exam				

Week	Lab
5	Introduction to Weka
6	Evaluation
7	Simple classifiers
8	Programming - Pre-processing data
9	More classifiers
10	Putting it all together
11	Programming - Clustering
12	Programming - Sequential pattern discovery

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (10%)			100%	
Programming (20%)			70%	30%
Midterm examination (30%)	50%	50%		
Final examination (40%)		40%	60%	

5. Rubrics (optional) 5.1. Grading checklist

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

5.4. Holistic rubric

Holi	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.

5.5. Analytic rubric

	Capstone	Milest	one	Benchmark
	4	3	2	1
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information	
	taken from	taken from	is taken from	Information is
	source(s) with	source(s) with	source(s)	taken from
Evidence	enough	enough	with some	source(s)
Selecting and	interpretation/	interpretation/	interpretation	without any
using	evaluation to	evaluation to	/ evaluation,	interpretation/
information to	develop a	develop a	but not	evaluation.
investigate a	comprehensive	coherent	enough to	Viewpoints of
point of view or	analysis or	analysis or	develop a	experts are
conclusion	synthesis.	synthesis.	coherent	taken as fact,

Critical thinking value rubric for evaluating questions in exams:

	Viewpoints of	Viewpoints of	analysis or	without
	experts are	experts are	synthesis.	question.
	questioned	subject to	Viewpoints	1
	thoroughly.	questioning.	of experts are	
			taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'	T1	position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others	identify some
Influence of	relevance of	several relevant	assumptions	contexts
innuence of	contexts when	presenting a	unan one s	when presenting a
context and	presenting a	presenting a	Versa)	presenting a
assumptions	Specific	position.	versaj.	position.
	position			
	(perspective			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	account the	Specific		
	complexities of	position		
	an issue. Limits	(perspective,		
	of position	thesis/hypothesi		
	(perspective,	s) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	~ .~
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
Studom 41 -	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	nypotnesis)	thesis/
position	within position	within position	acknowledge	nypotnesis) is
(perspecuve, thosis/hypothes:	(perspective,	thesis/	s unterent	stated, but is
e)	hypothesis)	hypothesis)	sides of all	obvious
<i>></i> /	nypoinceis).	nypomesisj.	15500.	ouvious.

			0 1	
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

TT

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Digital Image Processing

Course Code: IT130IU

1. General information

Course designation	This course provides students fundamental knowledge of digital image processing				
Semester(s) in which the course is taught	7				
Person responsible for the course	Dr. Ha Viet Uyen Synh				
Language	English				
Relation to curriculum	Elective (All programs)				
Teaching methods	Lecture, lesson, project,	seminar.			
Workload (incl.	Total workload: 195				
contact hours, self-	Contact hours: 45 (lectur	e) + 30 (laboratory)			
study nours)	hours: 120				
Credit points	Number of credits : 4				
1	Lecture: 3				
	Laboratory: 1				
Required and					
prerequisites for					
joining the course					
Course objectives	This course helps studen	ts discuss digital image processing			
5	fundamentals; review of	Digital Signal Processing algorithms			
	such as Discrete Fourier	Transform; intensity transforms,			
	frequency domain filtering	ng; image restoration and reconstruction;			
	color image processing;	multiresolution processing; image			
Course learning	CLO1 Understand base	s of digital image formation			
outcomes	CLO 2. Understand the c	color image foundations.			
outcomes	CLO 3. Apply special-do	omain image filtering.			
	Competency level	Course learning outcome (CLO)			
	Knowledge	1,2			
	Skill 3				
	Attitude				
Content	The description of the co	ntents should clearly indicate the			
	weighting of the content	and the level.			
	Weight: lecture session (3 hours)			
	Teaching levels: I (Introduce); T (Teach); U (Utilize)				

	Торіс	Weight	Level		
	Chapter 1: Introduction	3	I, T		
	Chapter 2: Digital Image Fundamentals	6	I, T		
	Chapter 3: Intensity Transformations and Spatial Filtering (part 1)	3	T, U		
	Chapter 3: Intensity Transformations and Spatial Filtering (part 2)	6	T, U		
	Chapter 4: Filtering in the frequency domain	6	T, U		
	Chapter 5: Image restoration and reconstruction	3	T, U		
	Chapter 6: Color Image processing	3	T, U		
	Chapter 7: Wavelets and multiresolution processing (part 1)	3	T, U		
	Chapter 7: Wavelets and multiresolution processing (part 2)	3	T, U		
	Chapter 8: Image compression	3	T, U		
	Chapter 9: Morphological image processing	3	T, U		
	Chapter 10: Image segmentation	3	T, U		
	Chapter 11: Representation and description	3	T, U		
	Chapter 12: Object recognition	3	T, U		
	Revision Application Design and Development	3			
Examination forms	Multiple-choice questions, short-answer question	ons			
Study and	Attendance: A minimum attendance of 80 perce	ent is com	pulsory		
examination	for the class sessions. Students will be assessed	on the bas	sis of		
requirements	their class participation. Questions and comments are strongly encouraged.				
	Assignments/Examination: Students must have	more than	1 50/100		
Des line list	points overall to pass this course.				
Keading list	6. Rafael C. Gonzalez, Richard E. Woods, I Processing 3rd, 2008	Digital Ima	ge		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х	X				
2	Х	X				
3						X

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Chapter 1: Introduction	1,2	Quiz, Lab, Exam	lecture, exercises	
2	Chapter 2: Digital Image Fundamentals	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
3	Chapter 3: Intensity Transformations and Spatial Filtering (part 1)	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	
4	Chapter 3: Intensity Transformations and Spatial Filtering (part 2)	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	
5	Chapter 4: Filtering in the frequency domain	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
6	Chapter 5: Image restoration and reconstruction	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
7	Chapter 6: Color Image processing	1,2	Quiz, Lab, Exam	lecture, exercises, lab	
8	Midterm				
9	Chapter 7: Wavelets and multiresolution processing (part 1)	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
10	Chapter 7: Wavelets and multiresolution processing (part 2)	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
11	Chapter 8: Image compression	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
12	Chapter 9: Morphological image processing	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
13	Chapter 10: Image segmentation	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
14	Chapter 11: Representation and description	2,3	Quiz, Lab, Exam	lecture, exercises, lab	
15	Chapter 12: Object recognition	2,3	Quiz, Lab, Exam	lecture, exercises, lab	

3. Planned learning activities and teaching methods

16	Revision Application Design and Development	1,2,3		
17	Final exam			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)	20%	20%	20%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	40%	40%	40%
Exercises/ Quiz (10%)	10%	10%	10%

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

5. Rubrics (optional)

Student: HW/Assignment:			
Date:			
	Eval	uator:	
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and summarizes	10		
principal content			
Introduction demonstrates thorough knowledge of	15		
relevant background and prior work			
Analysis and discussion demonstrate good subject	30		
mastery			
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/HWScoreDescription

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

8	Capstone	Milest	one	Benchmark
	4	3	2	1
	Issue/ problem to be considered critically is stated clearly and	Issue/ problem to be considered critically is	Issue/ problem to be considered critically is stated but description leaves some terms undefined	1
Explanation of issues	described comprehensively, delivering all relevant information necessary for full understanding.	stated, described, and clarified so that understanding is not seriously impeded by omissions.	ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive	Information is taken from source(s) with enough interpretation/ evaluation to develop a	Information is taken from source(s) with some interpretation/ evaluation, but not enough to	Information is taken from source(s) without any interpretation/
Evidence Selecting and using information to investigate a point of view or conclusion	analysis or synthesis. Viewpoints of experts are questioned thoroughly.	coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	develop a coherent analysis or synthesis. Viewpoints of experts are	evaluation. Viewpoints of experts are taken as fact, without question.

Critical thinking value rubric for evaluating questions in exams:

	1		talian ag	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions	Shows an
	Thomassahly		Identifies	Shows an
			Identifies	emerging
	(systematically		several	awareness of
	and		relevant	present
	methodically)		contexts when	assumptions
	analyzes own		presenting a	(sometimes
	and others'		position. May	labels
	assumptions and	Identifies own	be more	assertions as
	carefully	and others'	aware of	assumptions).
	evaluates the	assumptions and	others'	Begins to
	relevance of	several relevant	assumptions	identify some
Influence of	contexts when	contexts when	than one's	contexts when
aontoxt and	presenting o	presenting a	own (or vice	presenting a
	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific position			
	(perspective,			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	account the			
	complexities of	Specific position		
	an issue. Limits	(perspective.		
	of position	thesis/hypothesis)		
	(nerspective	takes into		
	thesis/	account the		
	hymothesis) and	account the		
	nypoinesis) are		C : C.	C
	acknowledged.	an issue. Others	Specific	Specific
	Others' points of	points of view	position	position
	view are	are	(perspective,	(perspective,
	synthesized	acknowledged	thesis/	thesis/
Student's	within position	within position	hypothesis)	hypothesis) is
position	(perspective,	(perspective,	acknowledges	stated, but is
(perspective,	thesis/	thesis/	different sides	simplistic and
thesis/hypothesis)	hypothesis).	hypothesis).	of an issue.	obvious.

			Conclusion is	
			logically tied	
	Conclusions and		to information	Conclusion is
	related outcomes	Conclusion is	(because	inconsistently
	(consequences	logically tied to a	information is	tied to some of
	and implications)	range of	chosen to fit	the
	are logical and	information,	the desired	information
	reflect student's	including	conclusion);	discussed;
	informed	opposing	some related	related
	evaluation and	viewpoints;	outcomes	outcomes
	ability to place	related outcomes	(consequences	(consequences
Conclusions and	evidence and	(consequences	and	and
related outcomes	perspectives	and implications)	implications)	implications)
(implications and	discussed in	are identified	are identified	are
consequences)	priority order.	clearly.	clearly.	oversimplified.

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks

	Capstone	<u>Jor cranading pro</u> Mile	stone	Benchmark
	4	3	2	1
	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	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable
Organization	cohesive	presentation	presentation	presentation
	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate
Language	Language in	audience.	presentation is	to audience.

	unagentation is		annuanista ta	
	presentation is			
	appropriate to		audience.	
	audience.			
	Delivery			
	technicues		Daliman	
	techniques	D 1'	Delivery	
	(posture,	Delivery	techniques	Delivery
	gesture, eye	techniques	(posture,	techniques
	contact, and	(posture,	gesture, eye	(posture, gesture,
	vocal	gesture, eye	contact, and	eye contact, and
	expressiveness)	contact, and	vocal	vocal
	make the	vocal	expressiveness)	expressiveness)
	presentation	expressiveness)	make the	detract from the
	compelling	make the	presentation	understandability
	and speaker	presentation	understandable	of the
	and speaker	interesting and	and speaker	presentation and
	appears			
	polished and	speaker appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples.	examples.	examples.	materials
	illustrations.	illustrations.	illustrations.	(explanations.
	statistics.	statistics.	statistics.	examples.
	analogies	analogies	analogies	illustrations
	quotations from	quotations from	quotations from	statistics
	rolevent	rolovont	rolovont	analogios
	authomitica)	authomitica)	authomitica)	analogies,
	authorities)	authorities)	authorities)	
	таке	таке	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on the	authority on the	authority on the	authority on the
Material	topic	topic	topic	topic
1VIAUCI 141	topic.	topic.	topic.	topic.

	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable,	consistent with	but is not often	explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities Date revised: February 15, 2022

> Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

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Went

Assoc.Prof. Nguyen Van Sinh

Course Name: Software Architecture

Course Code: IT114IU

1. General information

Course designation	This course provides student methodogies and techniques in				
Semester(s) in which the course is taught	7				
Person responsible for the course	Dr. Ha Viet Uyen Synh				
Language	English				
Relation to curriculum	Elective (CS)				
Teaching methods	Lecture, lesson, project,	, seminar.			
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours: 45 (lectu Private study including hours: 120	are) + 30 (laboratory) examination preparat	tion, speci	fied in	
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1				
Required and recommended prerequisites for joining the course					
Course objectives	Provides the student with methodologies and tech implementation of infor	th a thorough underst niques in analysis, de rmation system by usi	anding of sign and ing UML.	varyin	g
Course learning outcomes	CLO 1. Understand the Cycle and the technique CLO 2. Using a CASE CLO 3. Apply to a real	steps of the System I es for each step tool in analysis and d system	Developmo esign of a	ent Life system	e 1.
	Competency level	Course learning ou	itcome (C	LO)	
	Knowledge	1,2			
	Skill	3			
	Attitude				
Content	The description of the cweighting of the contentWeight: lecture sessionTeaching levels: I (IntroTopicIntroduction to system	ontents should clearly t and the level. (3 hours) oduce); T (Teach); U	y indicate (Utilize) Weight 3	the Leve	I
	design,				

	D	2	TU		
	Requirements.	3	1,0		
	Use Case Modeling	6	T,U		
	Dynamic Modeling	6	T,U		
	State-Dependent Dynamic Interaction	6	T,U		
	Modeling				
	Data Modeling	6	T,U		
	Normal Forms	6	T,U		
	Structural Modeing	6	T,U		
	Architectural Design.	3	I,T		
Examination forms	Multiple-choice questions, short-answer questions	stions			
Study and	Attendance: A minimum attendance of 80 pe	creent is			
examination	compulsory for the class sessions. Students v	vill be asso	essed on		
requirements	the basis of their class participation. Question	ns and con	nments		
-	are strongly encouraged.				
	Assignments/Examination: Students must ha	ve more th	nan		
	50/100 points overall to pass this course.				
Reading list	3. Kenneth E. Kendall, Julie E. Kendall, S	Systems A	nalvsis		
	and Design 7th, 2006				
	4. Gary B. Shelly, Thomas J. Cashman, Harry J.				
	Rosenblatt, Systems Analysis and Desi	gn 4th, 20	01		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1			X			
2			X			
3		X				

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to systems analysis and design,	1,2	Quiz	lecture, exercises	
2	Requirements.	1,2,3	Quiz, Lab	lecture, exercises, lab	
3	Use Case Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	
4	Midterm				
5	Dynamic Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab	

6	State-Dependent Dynamic Interaction Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
7	Data Modeling	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
8	Normal Forms	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
9	Structural Modeing	1,2,3	Quiz, Lab, Exam	lecture, exercises, lab
10	Architectural Design.	1,2	Quiz	lecture, exercises
11	Final exam			

4. Assessment plan

Assessment Type

Assessment Type	CLO1	CLO2	CLO3
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	40%	40%	40%
Exercises/ Quiz (10%)	10%	10%	10%
Lab. Assignments (20%)	20%	20%	20%

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

5. Rubrics (optional)

5.2. Grading checklist

Grading checklist for Written Reports				
Student:	HW/Assignment:			
Date:				
	Evalı	lator:		
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and summarizes	10			
principal content				
Introduction demonstrates thorough knowledge of	15			
relevant background and prior work				
Analysis and discussion demonstrate good subject	30			
mastery				
Summary and conclusions appropriate and complete	5			
Organization (10%)				

Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
Presentation (20%)		
Correct spelling, grammar, and syntax	10	
Clear and easy to read	10	
Quality of Layout and Graphics (10%)	10	
TOTAL SCORE	100	

5.3. Holistic rubric

Holi	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.

5.4. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milest	one	Benchmark
	4	3	2	1
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.

			If	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develon a	analysis or	without any
Fyidanca	comprehensive	coherent	synthesis	interpretation/
Evidence Solooting and		concretit analyzia an	Viewneinte	avaluation
Selecting and			viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position	assertions as
	assumptions	Identifies own	May be more	assumptions)
	and carefully	and others'	aware of	Begins to
	and carefully	and others	aware of	identify some
		assumptions and	ouners	identify some
Induces of	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	wnen
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific	Specific		
	position	position		
	(perspective,	(perspective,		
	thesis/	thesis/hypothesi	- · ~	
	hypothesis) is	s) takes into	Specific	a
	ımagınatıve,	account the	position	Specific
	taking into	complexities of	(perspective,	position
	account the	an issue. Others'	thesis/	(perspective,
Student's	complexities of	points of view	hypothesis)	thesis/
position	an issue. Limits	are	acknowledge	hypothesis) is
(perspective,	of position	acknowledged	s different	stated, but is
thesis/hypothesi	(perspective,	within position	sides of an	simplistic and
s)	thesis/	(perspective,	issue.	obvious.

	hypothesis) are	thesis/		
	acknowledged.	hypothesis).		
	Others' points of			
	view are			
	synthesized			
	within position			
	(perspective,			
	thesis/			
	hypothesis).			
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.

	Language			
	choices are			
	choices are		T an ave as	
	imaginative,	T		
	memorable,	Language	choices are	-
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience	audience	audience	to audience
Lunguage	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eve contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling.	presentation	presentation	understandability
	and speaker	interesting and	understandable	of the
	annears	speaker	and speaker	presentation and
	polished and	appears	annears	speaker appears
Delivery	confident	comfortable	tentative	uncomfortable
Denvery	A variety of	Supporting	Supporting	Insufficient
	types of	materials	materials	supporting
	supporting	(explanations	(explanations	materials
	motorials	(explainations,	examples	(avalanations
	(ovplanations	illustrations	illustrations	(explanations,
	(explainations,	inustrations,	infustitations,	illustrations
	examples,	statistics,	statistics,	inustrations,
	musuations,	analogies,	analogies,	statistics,
	statistics,	quotations	quotations	analogies,
	analogies,			quotations from
	quotations	authorities)	authorities)	relevant
	from relevant	make	make	authornes)
	aumornes)	appropriate	appropriate	to information
	inake	reference to	reference to	to information or
	appropriate	information or	information or	analysis that
	reference to	analysis that	analysis that	minimally
	information or	generally	partially	supports the
G	analysis that	supports the	supports the	presentation or
Supporting	significantly	presentation or	presentation or	establishes the
Material	supports the	establishes the	establishes the	presenter's

presentation or establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	credibility/ authority on the topic.
Central message is compelling (precisely stated, appropriately repeated, memorable, and strengly	Central message is clear and consistent with	Central message is basically understandable but is not often	Central message can be deduced but is not explicitly stated
and strongly supported)	the supporting material	repeated and 1s	in the presentation
	presentation or establishes the presenter's credibility/ authority on the topic. Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	presentation or establishes the presenter'spresenter's credibility/ authority on the topic.Central message is compelling (precisely stated,Central message is clear and clear and memorable, authorityCentral message is compelling (precisely tated,Central message is clear and clear and memorable, and strongly	presentation or establishes the presenter's credibility/ authority on the topic.presenter's credibility/ authority on the topic.credibility/ authority on the topic.authority on the topic.Central message is compelling (preciselyCentral message is central message is compelling (preciselyKated, appropriately memorable, and stronglyCentral message is consistent with authoritymemorable, and stronglyclear and the supporting metrial.memorable, and stronglymetrial.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering 🚿

Monte

Assoc.Prof. Nguyen Van Sinh

Course Name: Net-centric Programming

Course Code: IT096IU

1. General information

Course designation	Advanced programming course with focus on developing network application				
Semester(s) in which the course is taught	6				
Person responsible for the course	MS	c. Le Thanh Son			
Language	Eng	lish			
Relation to curriculum	Cor Elec	Compulsory (NE) Elective (CS)			
Teaching methods	Lec	ture			
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120				
Credit points	Nur Lec Lab	nber of credits : 4 ture: 3 oratory: 1			
Required and recommended prerequisites for joining the course	Cor	nputer Networks			
Course objectives	Adv netv Prog Tec Allo Rela Mui	vanced programming worked systems using gramming Tools, Sof hniques, Environmen ocation, Garbage Coll ationships, Signals, R ltiplexing, Datagram vice Driver and Kerne	with a focus on developing software y UNIX as a reference platform. Topic tware Design, Programming t of a UNIX Process, Memory lection, Process Control, Process eliable Signals, Threads, I/O and Stream Sockets, Multicasting, el Programming, Secure Programming	for cs:	
Course learning outcomes	CLO 1. Understand the structure of network applications CLO 2. Able to develop network applications using TCP and UDP sockets CLO 3. Understand and implement network applications using popular Internet protocols CLO 4. Team working				
		Competency level	Course learning outcome (CLO)		
		Knowledge	1, 2, 3		

		Skill	2, 3			
		Attitude	4			
Content	The weig Wei	<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)				
	To	Topic Weight Level				
	Ne	Network revisions 3			Ι	
	Int So	roduction to Client/S cket Programming	erver networking and	3	I, T	
	TC	CP Socket Programmi	ing	3	T, U	
	UI	OP Socket Programm	ing	3	T, U	
	So	cket name and DNS		3	T, U	
	Network Data and Network Errors					
	Caches and Message Queues 3				T, U	
	HJ	TTP Clients		3	T, U	
	HTTP Server 3				T, U	
	Web Socket, Web Frame Work3				T, U	
	Web Scraping 3				T, U	
	Building and Parsing Email			3	T, U	
	FT	'P	3	T, U		
	Te	lnet and SSH		3	T, U	
	Remote Procedure Call (RPC)			3	T, U	
Examination forms	Mu	tiple-choice question	s, short-answer question	ons		
Study and	Atte	endance: A minimum	attendance of 80 perce	ent is com	pulsory	
examination	for	the class sessions. Stu	idents will be assessed	on the ba	sis of	
requirements	thei	r class participation.	Questions and commen	its are stro	ongly	
		janments/Examinatic	n. Students must have	more than	50/100	
	poir	its overall to pass this	s course.	more man	1 50/ 100	
Reading list	 4. Michael J.Donahoo, Kenneth L.Calvert, TCP/IP Socket in C: A Practical Guide for Programmers 2nd 2009 			cket in		
	5.	W. R. Stevens, B. I	Fenner, A. M. Rudoff,	Unix Netv	vork	
		Programming, Vol. 2003	. 1: The Sockets Netwo	orking AP	[3rd,	
	 6. Brandon Rhodes, Foundations of Python Network Programming 3rd, 2014 					

2. Learning Outcomes Matrix

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					
2		XX				
3		XXX				
4						X

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Network revisions	1	Quiz	Lecture	2
2	Introduction to Client/Server networking and Socket Programming	2	Quiz, Lab, Midterm	Lecture	1
3	TCP Socket Programming	2	Quiz, Lab, Midterm	Lecture, Discussion	1, 2
4	UDP Socket Programming	2	Quiz, Lab, Midterm	Lecture, Discussion	1, 2
5	Socket name and DNS	2	Quiz, Lab, Midterm	Lecture, Discussion	2, 3
6	Network Data and Network Errors	2	Quiz, Lab, Midterm	Lecture, Discussion	2, 3
7	Caches and Message Queues	2	Quiz, Lab, Midterm	Lecture, Discussion	2, 3
8	HTTP Clients	3, 4	Quiz, Lab, Final	Lecture, Discussion	2, 3
Midter	'm exam				
9	HTTP Server	3, 4	Quiz, Lab, Final	Lecture, Discussion	2, 3
10	Web Socket, Web Frame Work	3, 4	Quiz, Final	Lecture, Discussion	2, 3
11	Web Scraping	3, 4	Quiz, Final	Lecture, Discussion	2, 3
12	Building and Parsing Email	3	Quiz, Final	Lecture, Discussion	2, 3
13	FTP	3	Quiz, Final	Lecture, Discussion	2, 3
14	Telnet and SSH	3	Quiz, Final	Lecture, Discussion	2, 3
15	Remote Procedure Call (RPC)	3	Quiz, Final	Lecture, Discussion	2, 3
Final e	xam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quiz / Assigment (10%)		10%	10%	100%
Labs (20%)	30%	30%	40%	
Midterm examination (30%)	70%	40%		
Final examination (40%)		20%	50%	

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

 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.

5. Rubrics (optional)

3.2. Grading checklist			
Grading checklist for Writt	en Repo	orts	
Student:	HW/A	Assignme	ent:
Date:	•••••		
	Evalu	ator:	
	•••••		
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and summarizes	10		
principal content			
Introduction demonstrates thorough knowledge of	15		
relevant background and prior work			
Analysis and discussion demonstrate good subject	30		
mastery			
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good	5		
transitions			
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. Grading checklist

5.2. Holistic rubric

Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HWScoreDescription

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
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information	
	taken from	taken from	is taken from	
	source(s) with	source(s) with	source(s)	
	enough	enough	with some	Information is
	interpretation/	interpretation/	interpretation	taken from
	evaluation to	evaluation to	/ evaluation,	source(s)
	develop a	develop a	but not	without any
Evidence	comprehensive	coherent	enough to	interpretation/
Selecting and	analysis or	analysis or	develop a	evaluation.
using	synthesis.	synthesis.	coherent	Viewpoints of
information to	Viewpoints of	Viewpoints of	analysis or	experts are
investigate a	experts are	experts are	synthesis.	taken as fact,
point of view or	questioned	subject to	Viewpoints	without
conclusion	thoroughly.	questioning.	of experts are	question.

			taken as	
			mostly fact	
			with little	
			questioning	
			questioning.	
			Questions	
			some	- 1
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
ussumptions	Specific	positioni	(eisa).	poblici
	position			
	(nerspective			
	thesis/			
	hypothesis) is			
	imaginative			
	taking into			
	account the	Specific		
	complexities of	position		
	an issue I imits	(perspective		
	of position	thesis/hypothesi		
	(perspective	s) takes into		
	thesis/	splanes into		
	hypothesis) are	complexities of	Specific	
	nypouresis) are	on issue Others!	position	Specific
	Others' points of	all issue. Others	(perspective	position
	view are	points of view	thesis/	(perspective
Student's	synthesized	acknowledged	hypothesis)	thesis/
nosition	within position	within position	acknowledge	hypothesis) is
(norsnoctivo	(nerspective	(nerspective	s different	stated but is
thesis/hynothesi	thesis/	thesis/	sides of an	simplistic and
	hypothesis)	hypothesis)		obvious
3)	nypomesisj.	nypomesisj.	15500.	ouvious.

			Conclusion	
			15 logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities

Oral communication value rudric for evaluating presentation tast	Oral	ral comm	unication	value	rubric	for	evaluating	presentation	tasks
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	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable,	generally	commonplace	minimally
	and	support the	and partially	support the
	compelling,	effectiveness	support the	effectiveness of
	and enhance	of the	effectiveness of	the presentation.
_	the	presentation.	the	Language in
Language	effectiveness	Language in	presentation.	presentation is

	0.1	· · ·	- ·	•
	of the	presentation is	Language in	not appropriate
	presentation.	appropriate to	presentation is	to audience.
	Language in	audience.	appropriate to	
	presentation is		audience.	
	appropriate to			
	audience.			
	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eve	(posture.	(posture.	techniques
	contact and	gesture eve	gesture eve	(posture gesture
	vocal	contact and	contact and	eve contact and
	expressiveness)	vocal	vocal	vocal
	males the	overagivanage)	avprassivanass)	vocal
		expressiveness)	expressiveness)	dature at from the
	presentation	make the	make the	
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of	-		
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations	quotations	quotations	statistics,
	from relevant	from relevant	from relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Matarial	the topic	the topic	the topic	topic
	Central	Central	Central	Central massage
Central	message is	message is	message is	can be deduced
Message	compelling	clear and	hasically	but is not
TTUSSALU	lounpoining		Jusically	0 UL 15 HOL

(precisely stated,	consistent with the supporting	understandable but is not often repeated and is	explicitly stated in the presentation
repeated, memorable,	materiai.	not memorable.	presentation.
and strongly supported.)			

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

TT

Wsuh

Assoc.Prof. Nguyen Van Sinh

Course Name: Information System Management

Course Code: IT094IU

1. General information

Course designation	This appl	course covers the co ications to business p	ncepts of information systems and their rocesses			
Semester(s) in which the course is taught	6					
Person responsible for the course	Dr.	Fran Thanh Tung				
Language	Engl	lish				
Relation to curriculum	Elec Spec	tive course (CS, DS) cialization (required)	(NE)			
Teaching methods	Lect	ure, lesson, project, s	eminar.			
Workload (incl. contact hours, self-study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120					
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1					
Required and recommended prerequisites for joining the course	Prine	ciples of Database M	anagement			
Course objectives	This course will aim to provide students with: The concepts of information systems and their applications to business processes.Use of computer-based information systems in functional areas of business. Understanding of computer and information technology, resources, management and end-user decision making, and system development.					
Course learning outcomes	CLC to bu CLC inclu envi CLC datal	decision making, and system development. CLO 1. understand basic information system concepts as applied to business operations and management. CLO 2. identify the major components of a computer system, including hardware, software, operating systems and operating environments as they apply to information systems. CLO 3. develop basic MIS applications such as spreadsheet, database, and web development.				
		Competency level	Course learning outcome (CLO)			

		Skill	3				
		Attitude					
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)						
	To	Topic Weight Leve					
	Inf	ormation Systems in	Global Business;	1	Ι		
	Glo	bal E-Business and (1	Ι			
	Infe Stra	ormation Systems, O ategy	2	Т			
	Eth Sys	ical and Social Issue stems;	1	Т			
	Tel Wi	ecommunications, th reless Technology;	1	Т			
	Foundations of Business Intelligence: Databases and Information Management				T,U		
	E-Commerce: Digital Markets, Digital Goods; Achieving Operational Excellence and Customer Intimacy: Enterprise Applications;				T,U		
					T,U		
	Bu	ilding Information Sy	/stems;	2	T,U		
	Ma	naging Knowledge;		1	Т		
	Enl	nancing Decision Ma	king.	1	Т		
Examination forms	Mul	tiple-choice question	s, short-answer question	ns			
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. 2.	Kenneth C. Laudon Information System Kenneth C. Laudon Management Inforr	, Jane P. Laudon, Mana ns: Managing the Digita and Jane Laudon, Esse nation Systems 11th, 20	agement al Firm 14t entials of 015	h, 2016		

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6

1	X	X	
2	X	X	
3	X		

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Information Systems in Global Business;	1	Midterm exam	In-class activities	
2	Global E-Business and Collaboration;	1	Midterm exam	In-class activities	
3	Information Systems, Organizations and Strategy	1,2	Midterm exam, Quiz	In-class activities, Lab	
4	Ethical and Social Issues in Information Systems;	1	Midterm exam		
5	Telecommunications, the Internet, and Wireless Technology;	2	Midterm exam	In-class activities, Lab	
6	Midterm				
7	Foundations of Business Intelligence: Databases and Information Management	2,3	Final exam	In-class activities, Lab	
8	E-Commerce: Digital Markets, Digital Goods;	1	Final exam	In-class activities, Lab	
9	Achieving Operational Excellence and Customer Intimacy: Enterprise Applications;	1	Final exam	In-class activities, Lab	
10	Building Information Systems;	2,3	Final exam	In-class activities, Lab	
11	Managing Knowledge;	1	Final exam		
12	Enhancing Decision Making.	1	Final exam		
13	Final exam				

4. Assessment plan

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

Assessment Type	CLO1	CLO2	CLO3
Midterm examination (30%)	40%	30%	20%

Projects/Presentations/ Report (20%)		40%	60%
Final examination (40%)	30%	20%	20%
Exercises/ Quiz (20%)	30%	10%	

5. Rubrics (optional) 5.1. Grading checklist

Grading checklist for Written Reports			
Student:	HW/Assignment:		
Date:	•••••		
	Evaluator:		
		S	
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and summarizes	10		
principal content			
Introduction demonstrates thorough knowledge of	15		
relevant background and prior work			
Analysis and discussion demonstrate good subject	30		
mastery			
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good	5		
transitions			
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
	4 Issue/ problem to be considered critically is stated clearly and described comprehensivel y, delivering all	Issue/ problem to be considered critically is stated, described, and	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored,	Issue/ problem to be considered
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information	Information is
Fyidence	taken from	taken from	is taken from	taken from
Selecting and	enough	enough	with some	without any
using und	interpretation/	interpretation/	interpretation	interpretation/
information to	evaluation to	evaluation to	/ evaluation	evaluation
investigate a	develop a	develon a	but not	Viewpoints of
noint of view or	comprehensive	coherent	enough to	experts are
conclusion	analysis or	analysis or	develop a	taken as fact,

	synthesis.	synthesis.	coherent	without
	Viewpoints of	Viewpoints of	analysis or	question.
	experts are	experts are	synthesis.	4
	questioned	subject to	Viewpoints	
	thoroughly.	questioning.	of experts are	
	6 7	1 0	taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific			
	position			
	(perspective,			
	hypothesis) is			
	imaginative			
	taking into			
	account the	Specific		
	complexities of	position		
	an issue. Limits	(perspective.		
	of position	thesis/hypothesi		
	(perspective,	s) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.

			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	
	choices are	choices are	choices are	Language
	imaginative,	thoughtful and	mundane and	choices are
	memorable,	generally	commonplace	unclear and
	and	support the	and partially	minimally
	compelling,	effectiveness	support the	support the
	and enhance	of the	effectiveness of	effectiveness of
	the	presentation.	the	the presentation.
	effectiveness	Language in	presentation.	Language in
Language	of the	presentation is	Language in	presentation is

		•	• •	• .
	presentation.	appropriate to	presentation is	not appropriate
	Language in	audience.	appropriate to	to audience.
	presentation is		audience.	
	appropriate to			
	audience.			
	Delivery			
	techniques	Deliverv	Deliverv	
	(posture.	techniques	techniques	Delivery
	gesture eve	(posture	(posture	techniques
	contact and	gesture eve	gesture eve	(nosture gesture
	vocal	contact and	contact and	eve contact and
	avpragivanage)	vocal	vocal	vocal
	males the	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies.	analogies.	analogies.	illustrations.
	quotations	quotations	quotations	statistics.
	from relevant	from relevant	from relevant	analogies
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	annronriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	analysis that	anarysis that	analysis that	minimally
	significantly	generally	gunnaria tha	supports the
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
G	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic.	the topic.	the topic.	topic.
	Central	Central	Central	Central message
	message is	message is	message is	can be deduced
Central	compelling	clear and	basically	but is not
Message	(precisely	consistent with	understandable	explicitly stated

stated, appropriately repeated, memorable, and strongly	the supporting material.	but is not often repeated and is not memorable.	in the presentation.
supported.)			

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Abut

Assoc.Prof. Nguyen Van Sinh

Course Name: IT Project Management

Course Code: IT056IU

1. General information

Course designation	This subject introduces to students the process of IT project management; the area of knowledge required and techniques appropriate for successful IT project management.
Semester(s) in which the course is taught	7
Person responsible for the course	Assoc. Prof. Nguyen Van Sinh
Language	English
Relation to curriculum	All programs: Elective course
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Object-Oriented Programming
Course objectives	This course provides students the fundamental IT project management knowledge, with particular emphasis on software products, project management and contemporary issues in the delivery of software solutions to business. It considers plan-driven and agile methodologies, estimating techniques, change management, risk management, and the role of project management in business. And it identifies the managerial control and reporting aspects necessary from inception to implementation of a software development project.
Course learning outcomes	CLO 1. Explain the IT project management process; CLO 2. Identify the areas of knowledge required for successful IT project management; CLO 3. Apply techniques appropriate for successful software project management;

	CLO 4. Communicate effectively to the team and stakeholders;				
	cons	truct project related d	locumentation.		
		Competency level	Course learning out	come (CL	0)
		Knowledge	CLO1		-
		Skill	CLO2, CLO3		
		Attitude	CLO4		
Content	The weig Weig Teac	description of the con hting of the content of ght: lecture session (3 hing levels: I (Introd	ntents should clearly in and the level. b teaching hours) uce); T (Teach); U (Ut	<i>dicate the</i> ilize)	
	Тој	pic		Weight	Level
	We cou	ek 1: Orientation & I rse	ntroduction to the	3	I,T
	We man	ek 2: Introduction to nagement	IT project	3	I,T
	Week 3: Software project planning3I,T,U				I,T,U
	Week 4: Estimation (cost, time, scope)			3	I,T,U
	We	Week 5: Project Schedules			I,T,U
	We	ek 6: Review process	5	3	I,T,U
	We	ek 7: Software Requi	rement	3	I,T,U
	We	ek 8: Design & Prog	ramming	3	I,T,U
	We	ek 9: Review for mid	3	U	
	We	ek 10: Design and Pr	ogramming	3	I,T,U
	We	ek 11: Software Test	ing	3	I,T,U
	We	ek 12: Understanding	g Change	3	I,T,U
	We	ek 13: Management a	and Leadership	3	I,T,U
	We	ek 14: Managing an	Outsourced Project	3	I,T,U
	We	ek 15: Process Impro	vement.	3	I,T,U
Examination forms	Mult writi	tiple-choice questions	s, short-answer question	ns and essa	y
Study and examination requirements	Attent the c class enco Assi poin	ndance: A minimum a class sessions. Studen participation. Qu uraged. gnments/Examination ts overall to pass this	attendance of 80 percernts will be assessed on testions and comment of Students must have course.	nt is compu n the basis ents are more thar	lsory for of their strongly n 50/100
Reading list	1. 2.	Kathy Schwalbe, IT Stellman and Green <i>Applied Software I</i> 2006.	Project Management - e, Project Management,	- 9th Editio O'Reilly M	n, 2019 Iedia,

	3. Marchewka, J.T., Information Technology Project	
	Management Providing Measureable Organizational Value	
	5th, 2016	

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1		Х				
2		Х	Х			
3		Х				Х
4			Х		Х	

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Orientation & Introduction to the course	1	Question and answer	Lecture,	[1, 2, 3]
2	Introduction to IT project management	1	Question and answer	Lecture, Discussion, In-class exercises	[1, 2, 3]
3	Software project planning	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
4	Estimation (cost, time, scope)	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
5	Project Schedules	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
6	Review process	2,3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]

7	Software Requirement	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
8	Design & Programming	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
9	Review for midterm examination	1,2,3		Discussion, In-class exercises	
10	Design and Programming	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
11	Software Testing	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
12	Understanding Change	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
13	Management and Leadership	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
14	Managing an Outsourced Project	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
15	Process Improvement.	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
16	Final examination	2,3,4			

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Midterm examination (30%)	40%	50%		
Projects/Presentations/ Report (20%)		40%	30%	30%
Final examination (40%)			70%	30%
Exercises/ Quiz (10%)	25%	25%	25%	25%

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:			••	
	Evalı	lator:		
	•••••	• • • • • • • • • • • • •		
	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	5			
transitions				
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

Holi	stic 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.

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

5.3.	Analytic	rubric		
Cuiti a al Alaira	him a malera	and a fam	an also adire a	

Critical thinking value rubric for evaluating questions in exams:

	relevance of		he more aware	Begins to
	contexts when		of others'	identify some
	presenting a		accumptions	contexts when
	presenting a		then one's own	contexts when
	position.		than one's own	presenting a
			(or vice	position.
			versa).	
	Specific position			
	(perspective,			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	account the			
	complexities of	Specific position		
	an issue. Limits	(perspective.		
	of position	thesis/hypothesi		
	(nerspective	s) takes into		
	thesis/	account the		
	hypothesis) are	complexities of		
	nypoinesis) are	complexities of	Spacific	Spacific
	Others! noints of	all issue. Others	specific	specific
	Others' points of	points of view	position	position
	view are	are	(perspective,	(perspective,
Student's	synthesized	acknowledged	thesis/	thesis/
position	within position	within position	hypothesis)	hypothesis) is
(perspective,	(perspective,	(perspective,	acknowledges	stated, but is
thesis/hypothe	thesis/	thesis/	different sides	simplistic and
sis)	hypothesis).	hypothesis).	of an issue.	obvious.
			Conclusion is	
	Conclusions and		logically tied	Conclusion is
	related outcomes	Conclusion is	to information	inconsistently
	(consequences	logically tied to	(because	tied to some of
	and	a range of	information is	the
	implications) are	information,	chosen to fit	information
	logical and	including	the desired	discussed;
	reflect student's	opposing	conclusion);	related
	informed	viewpoints;	some related	outcomes
Conclusions	evaluation and	related outcomes	outcomes	(consequences
and related	ability to place	(consequences	(consequences	and
outcomes	evidence and	and	and	implications)
(implications	perspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplified
consequences)	priority order.	clearly.	clearly.	•

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

Capstone	Milestone		Benchmark	
4	3	2	1	

	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	the hedry and	sequenced
	observable and	transitions) is	the body, and	the heady and
	no skilling and	clearly and	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	-	^	•
	choices are			
	imaginative,		Language	
	memorable,	Language	choices are	
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	I anguaga in	I anguaga in	I anguaga in	Language in
	necentation is	Language III	nresentation is	necentation is
	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience	audience.	audience.	to audience.
Lungunge	Delivery			
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eye contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	understor debility
	and speaker	interesting and	presentation	of the
	and speaker	sneaker	and speaker	presentation and
	nolished and	annears	annears	sneaker annears
Delivery	confident.	comfortable.	tentative.	uncomfortable.

	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(ovplanations	(avplanations	(avalanations	monting
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations	quotations	quotations	statistics,
	from relevant	from relevant	from relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic	the topic	the topic	topic
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated	Central	message is	Central message
	annronriately	message is	hasically	can be deduced
	repeated	clear and	understandable	but is not
	memorable	consistent with	but is not often	explicitly stated
Central	and strongly	the supporting	reneated and is	in the
Message	supported)	material	not memorable	presentation

Source: Association of American Colleges and Universities Date revised: February 15, 2022

> Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

scien Nomh

Assoc.Prof. Nguyen Van Sinh

Course Name: Computer Graphics

Course Code: IT024IU

1. General information

Course designation	This subject introduces the students to principles and algorithms of computer graphics and requirements of creating graphical applications.
Semester(s) in which the course is taught	6
Person responsible for the course	Assoc.Prof. Nguyen Van Sinh
Language	English
Relation to curriculum	Elective course (CS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Object-Oriented Programming
Course objectives	This course provides students the fundamentals of computer graphics concepts, methodologies, and processes. It develop an understanding of the algorithms and fundamental techniques for generating and modifying pictures/objects with a digital computer, including the handling of color, and the generation of visible-surface projections of three dimensional scenes, for applications in science, engineering, and the entertainment world (i.e. connect to the VR & AR application; Games industry and Images processing).
Course learning outcomes	CLO 1. Understand and apply the algorithms and fundamental techniques for generating and modifying pictures, 2D/3D objects with a digital computer. CLO 2. Understand and apply the handling of color, and the generation of visible-surface projections of 3D scenes, for applications in science, engineering and the entertainment world.

	CLO 3. Apply knowledge of mathematics and ability in graphical					
	prog	gramming to develop	games, construct and i	econstruc	t 2D/3D	
	obje	ects, process images,	VR & AR, etc.			
	CLO	O 4. Work in a team t	o ready build a compu	ter graphic	s	
	app	lication	[
		Competency level	Course learning out	come (CL	(O)	
		Knowledge	CLO1			
		Skill	CLO2, CLO3			
		Attitude	CLO4			
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 teaching hours) Teaching levels: I (Introduce); T (Teach); U (Utilize)					
	To	pic		Weight	Level	
	Week 1: Introduction to Computer Graphics,3I,TMathematics Foundation3					
	W	eek 2: Bessenham alg	gorithms	3	I,T,U	
	W	eek 3: Line clipping		3	I,T,U	
	W	eek 4: Polygon clippi	ng	3	I,T,U	
	W	eek 5: Transformation	n and Perspective	3	I,T	
	W	Week 6: Transformation (cont.)		3	I,T,U	
	W pro	Week 7: Introduction to OpenGL programing			I,T,U	
	W	eek 8: View Transfor	mation + Midterm	3	I,T,U	
	W	eek 9: 3D clipping		3	I,T,U	
	W	eek 10: Visual Surfac	e Determination	3	I,T,U	
	W	eek 11: Color Models	5	3	I,T,U	
	W	eek 12: Image Rende	ring and Generation	3	I,T,U	
	W	eek 13: Ray Tracing	& Texture Mapping	3	I,T,U	
	W	eek 14: Bezier Curve	and Surface	3	I,T,U	
	pro		1 . 1	2	ITI	
	W fin	al review	phics application;	3	1,1,0	
Examination forms	Mu	ltiple-choice question	s, short-answer question	ons (comp	uting	
Study and examination requirements	and programing) 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					
	poir	nts overall to pass this	s course.			

Reading list	 Steve Marschner and Peter Shirley, Fundamentals of Computer Graphics 5th, by A K Peters/CRC Press ISBN: 9780367505035, 2021.
	2. Frank Klawonn , Introduction to Computer Graphics Using Java 2D and 3D, 2nd Edition, Springer 2012.
	 Sumanta Guha, Computer Graphics Through OpenGL From Theory to Experiments Third Edition (AIT), CRC Press, 2019.
	4. John Vince, Mathematics for Computer Graphics, 5th Edition, Springer 2017.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х	Х				
2	Х	Х				
3		Х				Х
4					Х	

3. **Planned learning activities and teaching methods**

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to Computer Graphics, Mathematics Foundation	1	Quiz	Lecture,	[1, 4]
2	Bessenham algorithms	1, 2	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
3	Line clipping	1, 2	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
4	Polygon clipping	1, 2	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
5	Transformation and Perspective	2, 3	Quiz, Lab, Midterm exam	Lecture, Discussion,	[1, 2, 3]

				In-class exercises	
6	Transformation (cont.)	2, 3	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
7	Introduction to OpenGL	2,3,4	Quiz, Lab, Midterm exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
8	Midterm				
9	View Transformation	2, 3	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
10	3D clipping	2, 3	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
11	Visual Surface Determination	2, 3	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
12	Color Models	2, 3	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
13	Image Rendering and Generation	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
14	Ray Tracing & Texture Mapping	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
15	Bezier Curve and Surface processing	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, In-class exercises	[1, 2, 3]
16	Building graphics application; final review	2,3,4	Quiz, Lab, Final exam	Lecture, Discussion, Homework	[1, 2, 3]
17	Final exam				

Assessment plan				
Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (20%)		30%	30%	40%
Midterm examination (30%)	40%	60%		
Final examination (40%)		50%	50%	
Exercises/ Quiz (10%)	30%	40%	30%	

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:	•••••				
	Evalu	ator:			
	Max.	Score	Comments		
Technical content (60%)					
Abstract clearly identifies purpose and summarizes	10				
principal content					
Introduction demonstrates thorough knowledge of	15				
relevant background and prior work					
Analysis and discussion demonstrate good subject	30				
mastery					
Summary and conclusions appropriate and complete	5				
Organization (10%)					
Distinct introduction, body, conclusions	5				
Content clearly and logically organized, good	5				
transitions					
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

Holis	stic 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.

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	Milest	one	Benchmark
	4	3	2	1
	Issue/ problem to be considered critically is stated clearly and described comprehensivel y, delivering all relevant information necessary for	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermine d_and/ or	Issue/ problem to be considered critically is stated without clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
	Information is	Information is	Information	Information is
Evidence	taken from	taken from	is taken from	taken from
Selecting and	source(s) with	source(s) with	source(s)	source(s)
using	enough	enough	with some	without any
information to	interpretation/	interpretation/	interpretation	interpretation/
investigate a	evaluation to	evaluation to	/ evaluation,	evaluation.

point of view or	develop a	develop a	but not	Viewpoints of
conclusion	comprehensive	coherent	enough to	experts are
	analysis or	analysis or	develop a	taken as fact.
	synthesis.	synthesis.	coherent	without
	Viewpoints of	Viewpoints of	analysis or	question.
	experts are	experts are	svnthesis.	1
	questioned	subject to	Viewpoints	
	thoroughly.	questioning.	of experts are	
	6 5	1 8	taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific			
	position			
	(perspective,			
	thesis/	C : C.		
	hypotnesis) is	Specific		
	imaginative,	position		
	aking into	thesis/hymothesi		
	complexities of	s) takes into		
	an issue I imita	account the		
	of position	complexities of	Specific	
	(nerspective	an issue Others'	position	Specific
	thesis/	noints of view	(nerspective	position
	hypothesis) are	are	thesis/	(perspective.
Student's	acknowledged.	acknowledged	hypothesis)	thesis/
position	Others' points of	within position	acknowledge	hypothesis) is
(perspective,	view are	(perspective,	s different	stated, but is
thesis/hypothesi	synthesized	thesis/	sides of an	simplistic and
s)	within position	hypothesis).	issue.	obvious.

	(perspective, thesis/ hypothesis).			
	Conclusions and related	Conclusion is	Conclusion is logically tied to information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Source: Association of American Colleges and Universities Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable,	generally	commonplace	minimally
Language	and	support the	and partially	support the

	compelling,	effectiveness	support the	effectiveness of
	and enhance	of the	effectiveness of	the presentation.
	the	presentation.	the	Language in
	effectiveness	Language in	presentation.	presentation is
	of the	presentation is	Language in	not appropriate
	presentation.	appropriate to	presentation is	to audience.
	Language in	audience.	appropriate to	
	presentation is		audience.	
	appropriate to			
	audience.			
	Delivery			
	techniques	Deliverv	Deliverv	
	(posture.	techniques	techniques	Deliverv
	gesture, eve	(posture.	(posture.	techniques
	contact, and	gesture, eve	gesture, eve	(posture, gesture,
	vocal	contact and	contact and	eve contact and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	nresentation	make the	make the	detract from the
	compelling	nresentation	nresentation	understandability
	and speaker	interesting and	understandable	of the
		ancelson	and an aplan	of the
	appears	speaker	and speaker	presentation, and
Dallarana	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	c tentative.	uncomfortable.
	A variety of	Supporting	Supporting	T CC · ·
	types of	materials	materials	insufficient
	supporting	(explanations,	(explanations,	supporting
	materials	examples,	examples,	materials
	(explanations,	illustrations,	illustrations,	(explanations,
	examples,	statistics,	statistics,	examples,
	illustrations,	analogies,	analogies,	illustrations,
	statistics,	quotations	quotations	statistics,
	analogies,	from relevant	from relevant	analogies,
	quotations	authorities)	authorities)	quotations from
	from relevant	make	make	relevant
	authorities)	appropriate	appropriate	authorities)
	make	reference to	reference to	make reference
	appropriate	information or	information or	to information or
	reference to	analysis that	analysis that	analysis that
	information or	generally	partially	minimally
	analysis that	supports the	supports the	supports the
	significantly	presentation or	presentation or	presentation or
	supports the	establishes the	establishes the	establishes the
	presentation or	presenter's	presenter's	presenter's
	establishes the	credibility/	credibility/	credibility/
Supporting	presenter's	authority on	authority on	authority on the
	aradibility/	the tonic	the tonic	topic

	authority on the topic			
	Central			
	message is			
	compelling			
	(precisely		Central	
	stated,	Central	message is	Central message
	appropriately	message is	basically	can be deduced
	repeated,	clear and	understandable	but is not
	memorable,	consistent with	but is not often	explicitly stated
Central	and strongly	the supporting	repeated and is	in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Deep Learning

Course Code: IT157IU

1. General information

Course designation	This course helps students understand the capabilities, challenges, and consequences of deep learning and prepare students to participate in the development of leading-edge AI technology
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Mai Hoang Bao An
Language	English
Relation to curriculum	Elective (CS, DS)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	none
Course objectives	This course helps students understand the capabilities, challenges, and consequences of deep learning and prepare students to participate in the development of leading-edge AI technology. In this course, students will build and train neural network architectures such as Convolutional Neural Networks, Recurrent Neural Networks, Transformers, and learn how to make them better with strategies such as Dropout, BatchNorm, and more. Get ready to master theoretical concepts and their industry applications using Python and PyTorch and tackle real-world cases.
Course learning outcomes	CLO 1. Understand fundamental concepts of Deep Learning. Get familiar with some popular algorithms used in deep learning models. Understand and be able to use of popular libraries such as NumPy, PyTorch. CLO 2. Neural Networks for regression and classification. The concept of Multilayer Perceptrons. The essential networks:

	Convolutional Neural Networks (CNN), Recurrent Networks (RNN). CLO 3. Build, train, and deploy different types of Architectures from traditional to modern Architectures from traditional to modern Architectures from traditional to apply deep let to real-world scenarios: Computer Vision, Natur Processing.	ent Neura of Deep ectures. earning teo ral Langua	l chniq age	ues
		$\frac{2}{2} CLOA$	<i>(</i> 0)	
	Knowledge CLO 1, CLO 2, CLO	5, CLO 4		
	Skill CL03, CL04			
	Attitude CLO 3, CLO 4			
Content	Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach); U (Ut	ilize)	2	
	Торіс	Weight	Lev	vel
	Introduction to Deep Learning Some demos on the applications of Deep Learning	1	I, U	ſ
	Linear Classifiers, Optimization and Gradient Descent Backpropagation Algorithm Introduction to PyTorch library	1	I, T	
	Linear Neural Networks for Regression	1	Τ, Ι	J
	Linear Neural Networks for Classification			
	Multilayer Perceptrons	1	Τ, Ι	J
	Advances in PyTorch library	1	Τ, Ι	J
	Convolutional Neural Networks (CNN)	1	Τ, Ι	J
	Recurrent Neural Networks (RNN)	1	Τ, Ι	J
	 Modern CNN: Networks Using Blocks (VGG) Multi-Branch Networks (GoogLeNet) Residual Neural Network (Resnet) MobileNet 	2	Τ, Ι	J
	 Modern RNN: Gated Recurrent Units (GRU) Long Short-Term Memory (LSTM) Bidirectional RNN Encoder-Decoder Architecture Optimization Algorithms used in Deep 	2	T, U	
	Learning			

	Generative Adversarial Network (GAN) & Deep Convolution GAN	1	T, U	
	Deep Learning in Computer Vision	1	T, U	
	Deep Learning in Natural Language	1	T, U	
	Processing			
Examination forms	Short-answer questions, Long-answer questions questions	, program	ming	
Study and	Attendance: A minimum attendance of 80 perce	ent is comp	pulsory	
examination	for the class sessions. Students will be assessed on the basis of			
requirements	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] Ian Goodfellow, Yoshua Bengio and Aaron Learning, The MIT Press 2021, ISBN: 978-026	Courville, 2035613.	Deep	
	[2] Aston Zhang, Zachary C. Lipton, Mu Li, and Alexander J. Smola., Dive Into Deep Learning.			

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	1	2	3	4	5	6
1	Х					
2		X	X			
3			X	X		X
4				X		X

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to Deep Learning Some demos on the applications of Deep Learning	1		Lecture, Discussion	[1, 2] Chapter 1
2	Linear Classifiers, Optimization and Gradient Descent Backpropagation Algorithm Introduction to PyTorch library	1	Exercises	Lecture, In-class exercises	[1, 2] Chapter 2

3	Linear Neural Networks for Regression Linear Neural Networks for Classification	1, 2	Exercises	Lecture, In-class exercises	[2] Chapter 3, 4
4	Multilayer Perceptrons	2	Exercises	Lecture, In-class exercises	[2] Chapter 5
5	Advances in PyTorch library	1, 2	Exercises	Lecture, In-class exercises	[2] Chapter 6
6	Convolutional Neural Networks (CNN)	2	Exercises	Lecture, In-class exercises	[2] Chapter 7
7	Recurrent Neural Networks (RNN)	2	Quiz	Lecture, In-class quiz	[2] Chapter 9
8-9	 Modern CNN: Networks Using Blocks (VGG) Multi-Branch Networks (GoogLeNet) Residual Neural Network (Resnet) MobileNet 	2, 3	Exercises	Lecture, In-class exercises	[2] Chapter 8
10	Midterm				
11-12	 Modern RNN: Gated Recurrent Units (GRU) Long Short-Term Memory (LSTM) Bidirectional RNN Encoder-Decoder Architecture 	2, 3	Exercises	Lecture, In-class exercises	[2] Chapter 10
13	Optimization Algorithms used in Deep Learning	1, 4	Seminar	Lecture, Discussion	[2] Chapter 12
14	Generative Adversarial Network (GAN) & Deep Convolution GAN	3, 4	Seminar	Lecture, Discussion	[2] Chapter 18
15	Deep Learning in Computer Vision	4	Seminar	Lecture, Student presentaion	[2] Chapter 14
16	Deep Learning in Natural Language Processing	4	Seminar	Lecture, Student presentaion	[2] Chapter 15
17	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%
Final examination (40%)		30%	50%	50%

S. Rubrics (optional) S.1. Grading checklist

Grading checklist for Written Reports			
Student:	HW/Assignment:		
Date:	•••••		••
	Evalu	ator:	
	•••••		
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and summarizes	10		
principal content			
Introduction demonstrates thorough knowledge of	15		
relevant background and prior work			
Analysis and discussion demonstrate good subject	30		
mastery			
Summary and conclusions appropriate and complete	5		
Organization (10%)			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good	5		
transitions			
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

Holis	stic 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

a 1		7 7 •	<i>c</i> 1	• .•		•
(<i>rifical</i>)	thinking	value ruhric	tor eval	uating (TUPSTIONS I	n exams.
criticat	······································	ranne ratorie	<i>joi crui</i>			

	Capstone	Milest	Benchmark	
	4	3	2	1
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Evidence	comprehensive	coherent	synthesis.	interpretation/
Selecting and	analysis or	analysis or	Viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	Viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.

	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the	Identifies own and others' assumptions and	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others'	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
assumptions	presenting a position.	presenting a position.	versa).	presenting a position.
	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	Specific position (perspective, thesis/hypothesi s) takes into account the complexities of an issue. Others' points of view	Specific position (perspective, thesis/	Specific position
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
<u>s)</u>	hypothesis).	hypothesis).	1ssue.	obvious.
	and related	Logically tied to	is logically	inconsistently
	outcomes	a range of	tied to	tied to some
Conclusions	(consequences	information,	information	of the
and related	and	including	(because	information
outcomes	implications)	opposing	information	discussed;
(implications	are logical and	viewpoints;	is chosen to	related
and	reflect student's	related	tit the	outcomes
consequences)	informed	outcomes	desired	(consequence

evaluation and ability to place evidence and perspectives discussed in priority order.	(consequences and implications) are identified clearly.	conclusion); some related outcomes (consequence s and implications) are identified	s and implications) are oversimplifie d.
		clearly.	

Source: Association of American Colleges and Universities

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	Benchmark	
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language			
	choices are			
	imaginative,		Language	
	memorable,	Language	choices are	
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
_	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.

	Daliyamy			
	Delivery	Dellaren	Dellaren	
	techniques	Delivery	Delivery	
	(posture,	techniques	techniques	Delivery
	gesture, eye	(posture,	(posture,	techniques
	contact, and	gesture, eye	gesture, eye	(posture, gesture,
	vocal	contact, and	contact, and	eye contact, and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
v	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations	(explanations	(explanations	supporting
	examples	examples	examples	materials
	illustrations	illustrations	illustrations	(explanations
	statistics	statistics	statistics	examples
	statistics,	statistics,	statistics,	illustrations
	analogies,	analogies,	analogies,	statistics
	quotations	quotations	quotations	
	from relevant	from relevant	from relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	таке	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic.	the topic.	the topic.	topic.
	Central			
	message is		Central	
	compelling	Central	message is	Central message
	(precisely	message is	basically	can be deduced
	stated,	clear and	understandable	but is not
	appropriately	consistent with	but is not often	explicitly stated
Central	repeated.	the supporting	repeated and is	in the
Message	memorable,	material.	not memorable.	presentation.

supported.)	and strongly supported.)		
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Source: Association of American Colleges and Universities Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Joience Mouth 3

Assoc.Prof. Nguyen Van Sinh

Course Name: Internet of Things

Course Code: IT134IU

1. General information

Course designation	The course explains the architecture, components of Internet of Thing networks.			
Semester(s) in which the course is taught				
Person responsible for the course	Dr.	Le Duy Tan		
Language	Eng	glish		
Relation to curriculum	Ele	ctive (All programs)		
Teaching methods	Lec	ture, lesson, project,	seminar.	
Workload (incl. contact hours, self- study hours)	(Es Con labo Priv hou	timated) Total workle ntact hours (please sp oratory session, etc.): vate study including e urs: 120	bad: 195 ecify whether lecture, exercise, 45 (lecture) + 30 (laboratory) examination preparation, specified in	
Credit points	Nui Lec Lab	mber of credits: 4 cture: 3 poratory: 1		
Required and recommended prerequisites for joining the course	Con	nputer Networks		
Course objectives	The the Blu stor cou	e students will study t components from she letooth, Zigbee, Wi-fr rage, organization and rse.	the communication techniques between ort range to long range such as i, Lora, NB-IoT, Moreover, the data d analytics are also studied in this	
Course learning outcomes	CL Inte CL min	O 1. The ability of de ernet of Thing system O 2. The ability of co ning techniques to an	esigning and implementing some as; Illecting data then applying some data alyze the data in some IoT applications.	
		Competency level	Course learning outcome (CLO)	
		Knowledge	CLO 1	
		Skill	CLO 1 and CLO 2	
		Attitude	CLO 1	
Content	The wei We	e description of the co ghting of the content ight: lecture session (ontents should clearly indicate the and the level. (3 hours)	

	Teaching levels: I (Introduce); T (Teach); U (Utilize)				
	Торіс	Weight	Level		
	Week 1: Introduction to Internet of Things	1	Ι		
	Week 2 : IoT applications (1st presentation from industry)	1	U		
	Week 3: Sensors and actuators in IoTs	1	Т		
	Week 4-8: Communication technologies in IoTs: PAN (Bluetooth, Zigbee), LAN (IEEE 802.11), WAN (LoRa, LTE)	5	Т		
	Week 9: Data collection in IoT	1	T, U		
	Week 10: IoT applications (cont.) (2nd presentation from industry)	1	U		
	Week 11-14: Data analytics	4	T, U		
	Week 15: Review	1	U		
Examination forms	Multiple-choice questions, short-answer quest	ions			
Study and examination requirements	Attendance: A minimum attendance of 80 perc for the class sessions. Students will be assessed their class participation. Questions and comme encouraged. Assignments/Examination: Students must have 50/100 points overall to pass this course.	cent is con d on the ba ents are str e more tha	npulsory asis of ongly n		
Reading list	[1] Raj Kamal, Internet of Things Architecture and Design Principles, Mc Gra	aw Hill Ind	lia, 2017		
	[2] Hanes, David, et al. for fundament technologies, protocols, and use cases for things. Cisco Press, 2017.	or the int	working ernet of		
	 [3] Singh, Rajesh, et al. Internet of things with Raspberry Pi and Arduino. CRC Press, 2019. [4] Dow, Colin. Internet of things programming projects: build modern IoT solutions with the Raspberry Pi 3 and 				
	Python. Packt Publishing Ltd, 2018.				

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1		$\sqrt{\sqrt{}}$			$\sqrt{}$	
2						\checkmark

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning	Resources
				activities	
1	Introduction to Internet of Things	1, 2	Homework	Lecture, Discussion, Inclass-Quiz	[1]
------------	---	------	-----------------	--	------------
2	IoT applications (1st presentation from industry)	1	Homework	Lecture, Group work	[2]
3	Sensors and actuators in IoTs	1	Homework	Lecture, Discussion, Inclass-Quiz	[1]
4	Midterm		Written exam		
5 - 9	Communication technologies in IoTs: PAN (Bluetooth, Zigbee), LAN (IEEE 802.11), WAN (LoRa, LTE)	1	Homework	Lecture, Discussion, Inclass-Quiz	[1] [2]
10	Data collection in IoT	2	Homework	Lecture, Discussion, Inclass-Quiz	[1]
11	IoT applications (cont.) (2nd presentation from industry)	1, 2	Homework	Lecture, Group work	[2]
12 - 14	Data analytics	2	Homework	Lecture, Discussion, Inclass-Quiz, Presentation	[1]
15	Week 15: Review		Homework	Review-Test	
	Final exam		Written		
			exam		

4. Assessment plan

Assessment Type	CLO1	CLO2
Quiz (5%)		10%
Labs (20%)	20%	20%
Midterm examination (30%)	30%	20%
Projects/Presentations/ Report (5%)	25%	
Final examination (40%)	25%	50%

5. Rubrics (optional) 5.4. Grading checklist

Grading checklist for Written Reports			
Student:	HW/Assignment:		
Date:			

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

5.5. Holistic rubric

Holi	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.

5.6. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone Milestone		Benchmark	
	4	3	2	1
	Issue/ problem	Issue/ problem	Issue/	
	to be considered	to be considered	problem to	Issue/
	critically is	critically is	be	problem to be
	stated clearly	stated,	considered	considered
	and described	described, and	critically is	critically is
Explanation of	comprehensivel	clarified so that	stated but	stated without
issues	y, delivering all	understanding is	description	clarification

	relevant	not seriously	leaves some	or
	information	impeded by	terms	description
	necessary for	omissions	undefined	desemption.
	full	onnosions.	ambiguities	
	understanding		unexplored	
	understanding.		boundaries	
			undetermine	
			d and/or	
			u, anu/ or	
			unknown	
			unknown.	
			in tolyon from	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Evidence	comprehensive	coherent	synthesis.	interpretation/
Selecting and	analysis or	analysis or	Viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	Viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.

	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	Specific position (perspective, thesis/hypothesi s) takes into account the complexities of an issue. Others' points of view are	Specific position (perspective, thesis/	Specific position (perspective.
Student's	synthesized	acknowledged	hypothesis)	thesis/
position (perspective.	within position (perspective.	within position (perspective.	acknowledge s different	hypothesis) is stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.
	Conclusions and related outcomes	Conclusion is logically tied to	Conclusion is logically tied to information (because	Conclusion is inconsistently
	(consequences	a range of	information	tied to some
	and implications)	information,	1s chosen to fit the	of the information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
Conclusions	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
allu i clatcu outcomes	evidence and	and	s and	s and implications)
(implications	nerspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

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	Delivery	
	techniques	techniques	techniques	Delivery
	(posture,	(posture,	(posture,	techniques
	gesture, eye	gesture, eye	gesture, eye	(posture, gesture,
	contact, and	contact, and	contact, and	eye contact, and
	vocal	vocal	vocal	vocal
	expressiveness)	expressiveness)	expressiveness)	expressiveness)
	make the	make the	make the	detract from the
	presentation	presentation	presentation	understandability
Dalimar	compelling,	interesting, and	understandable,	oi the
Denvery	and speaker	speaker	and speaker	presentation, and

	appears polished and confident.	appears comfortable.	appears tentative.	speaker appears uncomfortable.
Supporting	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	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	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	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
Central	the topic. Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly	Central message is clear and consistent with the supporting	Central message is basically understandable but is not often repeated and is	Central message can be deduced but is not explicitly stated in the

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

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Assoc.Prof. Nguyen Van Sinh

Course Name: Mobile Application Development

Course Code: IT133IU

	nation		
Course designation	Advanced programming course with focus on mobile environment		
Semester(s) in which the course is taught	7		
Person responsible for the course	MSc. Le Thanh Son		
Language	English		
Relation to curriculum	Elective (All programs)		
Teaching methods	Lecture		
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120		
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1		
Required and recommended prerequisites for joining the course	Object-oriented analysis and design		
Course objectives	This course is designed to introduce and familiarize students with programming in the mobile environment: Android platform will be used throughout the course. The course starts with introductions to basic components, concepts, structures of Android applications then move on with common user interface elements, persistent storage, database for mobile etc. Introduction to most common tools and techniques for writing Android application is also included with hands on experience in form of lab exercise programming project.		
Course learning outcomes	CLO 1. Understand the structure of mobile application, especially Android application CLO 2. Understand most common mobile platform user interface, database, services CLO 3. Able to develop mobile application CLO 4. Team working Competency level Course learning outcome (CLO)		

1. General information

	T		1			
		Knowledge	1			
		Skill	2, 3			
		Attitude	4			
Content	The	description of the co	ontents should clearly i	indicate th	е	
	wei	ghting of the content	and the level.			
	We	ight: lecture session ((3 hours)			
	Tea	ching levels: I (Intro	duce); T (Teach); U (U	Jtilize)	Γ	_
	T	opic		Weight	Level	l
	In	troduction to mobile	programming	3	Ι	
	A	Android and Modal View Controller			I, T	
	Α	Activity Lifecycle			Ι, Τ	
	Α	Adroid SDK Versions and Compatbility			I, T	
	C	Creating UI: Layout and Widgets			T, U	
	Li	stFragment		3		
	V	iewPager	3	T, U		
	Dialogs			3	T, U	
	MediaPlayer			3	T, U	
	Action Bar			3	T, U	
	Saving and Loading Local Files 3				T, U	
	С	ontext Menu and Cor	ntextual Action Mode	3	T, U	
	Та	aking Pictures and Ha	andling Images	3	T, U	
	In	tents		3	T, U	
	B	rowsing the Web & V	WebView	3	T, U	
Examination forms	Mu	ltiple-choice questior	ns, short-answer questi	ons		
Study and	Atte	endance: A minimum	attendance of 80 perc	ent is con	pulsory	y
examination	for	the class sessions. Stu	udents will be assessed	d on the ba	isis of	
requirements	thei	r class participation.	Questions and comme	nts are str	ongly	
	encouraged.					
	Ass	ignments/Examination	on: Students must have	e more tha	n 30/10)0
Reading list		C Stawart V Mar	s course.		The	
i i couuning not	3	Big Nerd Ranch G	uide 3rd. 2017	granning	The	
	Δ	D Griffiths Head	First Android Develor	ment· A I	Rrain_	
		Friendly Guide 1st	, 2015		<i>J</i> 10111	

2. Learning Outcomes Matrix

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				
2	X				
3		XX			XXX
4			X		XXX

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to mobile programming	1	Quiz	Lecture	2
2	Android and Modal View Controller	1	Quiz	Lecture	2
3	Activity Lifecycle	1	Quiz	Lecture	2
4	Adroid SDK Versions and Compatbility	1	Quiz, Lab, Midterm	Lecture, Discussion	2
5	Creating UI: Layout and Widgets	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In- class Exercise	1
6	ListFragment	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In- class Exercise	1
7	ViewPager	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In- class Exercise	1
8	Dialogs	2, 3, 4	Quiz, Lab, Midterm	Lecture, Discussion, In- class Exercise	1
	Midterm				
9	MediaPlayer	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In- class Exercise	1
10	Action Bar	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In- class Exercise	1
11	Saving and Loading Local Files	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In- class Exercise	1
12	Context Menu and Contextual Action Mode	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In- class Exercise	1

13	Taking Pictures and Handling Images	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In- class Exercise	1
14	Intents	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In- class Exercise	1
15	Browsing the Web & WebView	2, 3, 4	Quiz, Lab, Final	Lecture, Discussion, In- class Exercise	1
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Quiz / Assigment (10%)	50%	10%	10%	70%
Labs (20%)	10%	30%	30%	30%
Midterm examination (30%)	30%	30%	30%	
Final examination (40%)	10%	30%	30%	

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

5. Rubrics (optional)

5.4. Grading checklist

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

5.5. Holistic rubric

Holi	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.

5.6. Analytic rubric

critical intinuity fame for cranating questions in enames

	Capstone	Milest	one	Benchmark
	4	3	2	1
	Issue/ problem		Issue/ problem to be considered critically is stated but	
Explanation of issues	to be considered critically is stated clearly and described comprehensivel y, 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.	description leaves some terms undefined, ambiguities unexplored, boundaries undetermine d, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
	Information is taken from	Information is taken from	Information is taken from	Information is taken from
Evidence	source(s) with	source(s) with	source(s)	source(s)
Selecting and	enough	enough	with some	without any
using	interpretation/	interpretation/	interpretation	interpretation/
information to	evaluation to	evaluation to	/ evaluation,	evaluation.
investigate a	develop a	develop a	but not	Viewpoints of
point of view or	comprehensive	coherent	enough to	experts are
conclusion	analysis or	analysis or	develop a	taken as fact,

	synthesis.	synthesis	coherent	without
	Viewpoints of	Viewpoints of	analysis or	question.
	experts are	experts are	synthesis.	4
	questioned	subject to	Viewpoints	
	thoroughly.	questioning.	of experts are	
	6 7	1 0	taken as	
			mostly fact,	
			with little	
			questioning.	
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific			
	position			
	(perspective,			
	hypothesis) is			
	imaginative			
	taking into			
	account the	Specific		
	complexities of	position		
	an issue. Limits	(perspective.		
	of position	thesis/hypothesi		
	(perspective,	s) takes into		
	thesis/	account the		
	hypothesis) are	complexities of	Specific	
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.

			Conclusion	
			Conclusion	
			is logically	
	Conclusions		tied to	
	and related	Conclusion is	information	Conclusion is
	outcomes	logically tied to	(because	inconsistently
	(consequences	a range of	information	tied to some
	and	information,	is chosen to	of the
	implications)	including	fit the	information
	are logical and	opposing	desired	discussed;
	reflect student's	viewpoints;	conclusion);	related
	informed	related	some related	outcomes
Conclusions	evaluation and	outcomes	outcomes	(consequence
and related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications)	implications)	are
and	discussed in	are identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

Oral communication value rubric for evaluating presentation task	Oral	communication	value rubric	for	evaluating	presentation	tasks
--	------	---------------	--------------	-----	------------	--------------	-------

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable,	generally	commonplace	minimally
	and	support the	and partially	support the
	compelling,	effectiveness	support the	effectiveness of
	and enhance	of the	effectiveness of	the presentation.
_	the	presentation.	the	Language in
Language	effectiveness	Language in	presentation.	presentation is

	1	1	1	
	of the	presentation is	Language in	not appropriate
	presentation.	appropriate to	presentation is	to audience.
	Language in	audience.	appropriate to	
	presentation is		audience.	
	appropriate to			
	audience.			
	Deliverv			
	techniques	Delivery	Deliverv	
	(posture	techniques	techniques	Delivery
	gesture eve	(posture	(posture	techniques
	contact and	gesture eve	gesture eve	(posture gesture
	vocal	gesture, eye	gesture, eye	(posture, gesture,
	vocal			
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	expressiveness)
	presentation	make the	make the	detract from the
	compelling,	presentation	presentation	understandability
	and speaker	interesting, and	understandable,	of the
	appears	speaker	and speaker	presentation, and
	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies.	analogies.	analogies.	illustrations,
	quotations	quotations	quotations	statistics.
	from relevant	from relevant	from relevant	analogies.
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	nartially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	nrecenter's	nrecenter's	nrecenter's	nrecenter's
	aradibility/	aradibility/	aradibility/	presenter s
Sunnorting	outhority or	outhority or	outhority or	outhority on the
Supporting	the toric	the terric	the terric	tonio
wiaterial	Control	Control	Control	Control
Contral	Central .	Central .	Central .	Central message
Central	message is	message is	message is	can be deduced
Message	compelling	clear and	basically	but 1s not

(precisely stated, appropriately repeated, memorable	consistent with the supporting material.	understandable but is not often repeated and is not memorable.	explicitly stated in the presentation.
and strongly supported.)			

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering 🚿

science Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Human-Computer Interaction

Course Code: IT044IU

1. General information					
Course designation	This cou between	rse provides studen human and comput	ts with fundamental interaction principle ters.	s	
Semester(s) in which the course is taught	7,8				
Person responsible for the course	Dr. Vi C	hi Thanh			
Language	English				
Relation to curriculum	Elective (CS)				
Teaching methods	Lecture,	lesson, project, sen	ninar.		
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120				
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1				
Required and recommended prerequisites for joining the course	None				
Course objectives	This cou between	rse provides studen human and comput	ts with fundamental interaction principle ers.	s	
Course learning outcomes	CLO 1. Know how to gather requirements. CLO 2 Apply human-computer interaction principles in user interface design process CLO 3 Choose the appropriate interface evaluation method CLO 4. Understand different design principles for mobile applications, the Web, and emerging technologies.				
		Competency level	Course learning outcome (CLO)		
		Knowledge	2, 3, 4		
		Skill	1		
		Attitude	1		
Content	The desc of the co	cription of the content entent and the level.	nts should clearly indicate the weighting		

	Weight	lecture session (3 hours)			
	Teachin	g levels: I (Introduce); T (Teach); U (Utilize)		
		Торіс	Weigh	Leve	
		-	t	1	
		Human factors	1	Ι	
		Human perception and cognition principles		Т	
		User-centered design		T,U	
		Requirements gathering techniques	1	T,U	
		Interface design process	2	T,U	
		Prototyping techniques	2	T,U	
		Interface evaluation methodology	1	T,U	
		Interaction styles and techniques	1	Т	
		HCI for mobile applications, the Web, and emerging technologies	2	T,U	
		Data analysis	1	T.U	
Examination forms	Short-a	nswer questions		,	
Study and	Attenda	nce: A minimum attendance of 80 per	cent is co	ompulsory for	
examination	the clas	s sessions. Students will be assessed o	n the basi	is of their clas	s
requirements	particip	ation. Questions and comments are str	ongly en	couraged.	
•	Assign	nents/Examination: Students must hav	ve more th	nan 50/100	
	points o	verall to pass this course.			
Reading list	 [1] Sharp, H., Preece, J., Rogers, Y. (2019). Interaction Design: Beyond Human-Computer Interaction. United Kingdom: Wiley. [2] Dix, A. (2003). Human-computer Interaction. Germany: Pearson/Prentice-Hall. 				
	[3] Mac Empiric	Kenzie, I. S. (2012). Human-Compute al Research Perspective. Netherlands:	er Interac Elsevier	tion: An Science.	

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	1	2	3	4	5	6
1			Х			
2	Х				Х	
3		X			X	
4		X				

Week	Торіс	CLO	Assessme nts	Learning activities	Resources
1	Human factors	1	Midterm exam	In-class activities	
2,3	Human perception and cognition principles	2	Midterm exam	In-class activities	
4,5	User-centered design	2	Midterm exam, Project, Lab quiz	In-class activities	
6	Requirements gathering techniques	1	Midterm exam, Project	In-class activities	
7,8	Interface design process	2	Midterm exam, Project	In-class activities	
Midter	'm exam				
9,10	Prototyping techniques	2	Project	In-class activities	
11	Interface evaluation methodology	3	Final exam, Project	In-class activities	
12	Interaction styles and techniques	3	Final exam	In-class activities	
13,14	HCI for mobile applications, the Web, and emerging technologies	4	Lab quiz	In-class activities	
15	Data analysis	2, 4	Final exam, Project	In-class activities	
Final e	xam				

3. Planned learning activities and teaching methods

4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO4
Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%
Final examination (40%)		30%	50%	50%

5. Rubrics (optional)

5.4. Grading checklist

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

5.5. Holistic rubric

Holis	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.

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5.6. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	
	critically is stated	to be considered	terms	
	clearly and	critically is	undefined	
	described	stated.	ambiguities	
	comprehensively	described and	unexplored	Issue/ problem
	delivering all	clarified so that	boundaries	to be considered
	relevant	understanding is	undetermined	critically is
Explana	information	not seriously	and/ or	stated without
tion of	necessary for full	impeded by	backgrounds	clarification or
	understanding	omissions	unknown	description
155005	understanding.	011113510113.	Information is	description.
			taken from	
			source(s) with	
	Information is	Information is	some	
Fyidenc	taken from	taken from	interpretation/	
	source(s) with	source(s) with	evaluation but	
Selecting	enough	enough	not enough to	
and	interpretation/	interpretation/	develop a	Information is
una usina	evaluation to	evaluation to	coherent	taken from
informati	develop a	develop a	analysis or	source(s)
on to	comprehensive	coherent	synthesis	without any
investion	analysis or	analysis or	Viewpoints of	interpretation/
te a	synthesis	synthesis	experts are	evaluation
noint of	Viewpoints of	Viewpoints of	taken as	Viewpoints of
view or	experts are	experts are	mostly fact	experts are taken
conclusi	questioned	subject to	with little	as fact, without
on	thoroughly.	questioning	questioning	question.
	Thoroughly	-1	Questions	Shows an
	(systematically and		some	emerging
	methodically)		assumptions	awareness of
	analyzes own and		Identifies	present
	others'	Identifies own	several	assumptions
Influenc	assumptions and	and others'	relevant	(sometimes
e of	carefully evaluates	assumptions and	contexts when	labels assertions
context	the relevance of	several relevant	presenting a	as assumptions)
and	contexts when	contexts when	position May	Begins to
assumnt	presenting a	presenting a	be more aware	identify some
ions	position.	position.	of others'	contexts when

			assumptions than one's own (or vice versa).	presenting a position.
Student' s position (perspec tive, thesis/hy pothesis)	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/hypothesi s) 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.
Conclusi ons and related outcome s (implica tions and consequ	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are

Oral communication value rubric for evaluating presentation tasks:

Capstone	Milestone		Benchmark
4	3	2	1

Organiz ation	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.
Languag e	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 techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the	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
	speaker appears	interesting, and speaker appears	and speaker appears	and speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
Supporti	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	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	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	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
Material	topic.	topic.	topic.	topic.
Central	Central message is compelling (precisely stated,	Central message is clear and	Central message is basically understandable	can be deduced but is not explicitly stated in the

repeated, memorabl strongly	e, and material.	g repeated and is not memorable.	
supported)		

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Cloud Computing

Course Code: IT164IU

1. General in	formation
Course designation	The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure.
Semester(s) in which the course is taught	7
Person responsible for the course	Dr. Le Duy Tan
Language	English
Relation to curriculum	Elective (CS, NE, CE)
Teaching methods	Lecture
Workload (incl. contact hours, self- study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours. Private study including examination preparation, specified in hours: 120 hours.
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Computer Networks
Course objectives	This course concentrates on parallel programming techniques for cloud computing and large-scale distributed systems which form the cloud infrastructure. The topics include overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art solutions for cloud computing developed by Google, Amazon, Microsoft, Yahoo, VMWare, etc. Students will also apply what they learn in one programming assignment and one project executed over Amazon Web Services.
Course learning outcomes	CLO 1. Analyze the trade-offs between deploying applications in the cloud and over the local infrastructure.CLO 2. Able to deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.

	CLO 3. Solve a real-world problem using cloud computing through				
	group collaboration.				
	Competency level	Course learning o (CLO)	utcome		
	Knowledge	1			
	Skill	2, 3			
	Attitude	3			
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce): T (Teach): U (Utilize)				
	Торіс		Weigh t	Level	
	Introduction to Cloud Con	nputing	1	Ι	
	Cloud Computing Platform	ns	3	Т	
	Parallel Programming in the	ne Cloud	3	T, U	
	Distributed Storage System	ns	3	T, U	
	Virtualization		2	T, U	
	Cloud Security		2	Т	
	Multicore Operating Syste	ms	1	Т	
Examination forms	Short-answer questions, Programming exercises				
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	 6. Rountree, Derrick, and Ileana Castrillo. <i>The basics of cloud computing: Understanding the fundamentals of cloud computing in theory and practice</i>. Newnes, 2013. 7. Patterson, Scott. Learn AWS Serverless Computing: A Beginner's Guide to Using AWS Lambda, Amazon API Gateway, and Services from Amazon Web Services. Packt Dublishing AMA 2010. 				

2. Learning Outcomes Matrix

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 T	1	2	3	4	5	6
1	Х					
2		XX				

3					Х
3.	Planned learning activities and	teaching	g methods		
We	Торіс	CLO	Assessment	Learning	Resource
ek	-		S	activities	S
1	Introduction to Cloud Computing	1	Quiz	Lecture	1
2	Cloud Computing Platforms – Part 1	1	Quiz	Lecture	1
3	Cloud Computing Platforms – Part 2	1	Quiz	Lecture, Discussion , In-class Exercise	2
4	Cloud Computing Platforms – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
5	Parallel Programming in the Cloud – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
6	Parallel Programming in the Cloud – Part 2	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	2
7	Parallel Programming in the Cloud – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
8	Distributed Storage Systems – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
Midt	erm				
9	Distributed Storage Systems – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
10	Distributed Storage Systems – Part 3	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
11	Virtualization – Part 1	2,3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1

12	Virtualization – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
13	Cloud Security – Part 1	2,3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1, 2
14	Cloud Security – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
15	Multicore Operating Systems	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
Fina	l				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz / Assigment (10%)	50%	10%	10%
Labs (20%)	10%	30%	30%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	10%	30%	30%

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/Assignme	ent:		•••••	
Evaluator:	•••••		•••••	
Date:				
	Max.	Score	Comments	
Technical content (60%)				
Abstract clearly identifies purpose and	10			
summarizes principal content				
Introduction demonstrates thorough	15			
knowledge of relevant background and prior				
work				

Analysis and discussion demonstrate good	30	
subject mastery		
Summary and conclusions appropriate and	5	
complete		
Organization (10%)		
Distinct introduction, body, conclusions	5	
Content clearly and logically organized, good	5	
transitions		
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
			Issue/ problem	
	Issue/ problem to		to be	
	be considered	Issue/ problem	considered	
	critically is stated	to be considered	critically is	
	clearly and	critically is	stated but	
	described	stated,	description	
	comprehensively,	described, and	leaves some	Issue/ problem
	delivering all	clarified so that	terms	to be considered
Expla	relevant	understanding is	undefined,	critically is
natio	information	not seriously	ambiguities	stated without
n of	necessary for full	impeded by	unexplored,	clarification or
issues	understanding.	omissions.	boundaries	description.

			undetermined	
			and/or	
			backgrounds	
			unknown	
			ulikilowii.	
Evide			Information is	
nce			taken from	
Selecti			source(s) with	
na	Information is	Information is	some	
ng and	taken from	taken from	interpretation/	
unu usina	cource(s) with	cource(a) with	avaluation but	
using	source(s) with	source(s) with	evaluation, but	
injorm	intermentation /	enougn internetation/	not enough to	Information in
allon	interpretation/	interpretation/	develop a	Information 1s
to	evaluation to	evaluation to	conerent	taken from
investi	develop a	develop a	analysis or	source(s)
gate a	comprehensive	coherent	synthesis.	without any
point	analysis or	analysis or	Viewpoints of	interpretation/
of	synthesis.	synthesis.	experts are	evaluation.
view	Viewpoints of	Viewpoints of	taken as	Viewpoints of
or	experts are	experts are	mostly fact,	experts are taken
conclu	questioned	subject to	with little	as fact, without
sion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	Shows an
			assumptions.	emerging
	Thoroughly		Identifies	awareness of
	(systematically and		several	present
	methodically)		relevant	assumptions
	analyzes own and		contexts when	(sometimes
Influe	others'	Identifies own	presenting a	labels assertions
nce of	assumptions and	and others'	position. May	as assumptions).
conte	carefully evaluates	assumptions and	be more aware	Begins to
xt	the relevance of	several relevant	of others'	identify some
and	contexts when	contexts when	assumptions	contexts when
assum	presenting a	presenting a	than one's own	presenting a
ptions	position.	position.	(or vice versa).	position.
	Specific position	Specific		
	(perspective,	position		
Stude	thesis/ hypothesis)	(perspective,		
nt's	is imaginative,	thesis/hypothesi		
positi	taking into account	s) takes into	Specific	
on	the complexities of	account the	position	Specific position
(pers	an issue. Limits of	complexities of	(perspective,	(perspective,
pectiv	position	an issue. Others'	thesis/	thesis/
e,	(perspective,	points of view	hypothesis)	hypothesis) is
thesis/	thesis/ hypothesis)	are	acknowledges	stated, but is
hypot	are acknowledged.	acknowledged	different sides	simplistic and
hesis)	Others' points of	within position	of an issue.	obvious.

	view are synthesized within position (perspective, thesis/ hypothesis).	(perspective, thesis/ hypothesis).		
			Conclusion is	
		Conclusion is	logically tied	
Concl		logically tied to	to information	
usions	Conclusions and	a range of	(because	
and	related outcomes	information,	information is	
relate	(consequences and	including	chosen to fit	Conclusion is
d	implications) are	opposing	the desired	inconsistently
outco	logical and reflect	viewpoints;	conclusion);	tied to some of
mes	student's informed	related	some related	the information
(impli	evaluation and	outcomes	outcomes	discussed;
cation	ability to place	(consequences	(consequences	related outcomes
s and	evidence and	and	and	(consequences
conse	perspectives	implications)	implications)	and
quenc	discussed in	are identified	are identified	implications) are
es)	priority order.	clearly.	clearly.	oversimplified.

	Capstone	Milestone		Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced material
	is skillful and	clearly and	transitions) is	within the body,
	makes the	consistently	intermittently	and transitions) is
Orga	content of the	observable	observable	not observable
nizati	presentation	within the	within the	within the
on	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language choices
	choices are	choices are	choices are	are unclear and
	imaginative,	thoughtful and	mundane and	minimally support
Lang	memorable, and	generally	commonplace	the effectiveness of
uage	compelling, and	support the	and partially	the presentation.

	enhance the	effectiveness of	support the	Language in
	effectiveness of	the	effectiveness of	presentation is not
	the presentation.	presentation.	the	appropriate to
	Language in	Language in	presentation.	audience.
	presentation is	presentation is	Language in	
	appropriate to	appropriate to	presentation is	
	audience.	audience.	appropriate to	
			audience.	
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the presentation,
	speaker appears	interesting, and	and speaker	and speaker
Delive	polished and	speaker appears	appears	appears
ry	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of	~ .	~ ·	
	supporting	Supporting	Supporting	
	materials	materials	materials	T 00 7
	(explanations,	(explanations,	(explanations,	Insufficient
	examples,	examples,	examples,	supporting
	illustrations,	illustrations,	illustrations,	materials
	statistics,	atotiatioa		1 1
	1 .		statistics,	(explanations,
	analogies,	analogies,	statistics, analogies,	(explanations, examples,
	analogies, quotations from	analogies, quotations from	statistics, analogies, quotations from	(explanations, examples, illustrations,
	analogies, quotations from relevant	analogies, quotations from relevant	statistics, analogies, quotations from relevant	(explanations, examples, illustrations, statistics,
	analogies, quotations from relevant authorities)	analogies, quotations from relevant authorities)	statistics, analogies, quotations from relevant authorities)	(explanations, examples, illustrations, statistics, analogies,
	analogies, quotations from relevant authorities) make	analogies, quotations from relevant authorities) make	statistics, analogies, quotations from relevant authorities) make	(explanations, examples, illustrations, statistics, analogies, quotations from
	analogies, quotations from relevant authorities) make appropriate	analogies, quotations from relevant authorities) make appropriate	statistics, analogies, quotations from relevant authorities) make appropriate	(explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make
	analogies, quotations from relevant authorities) make appropriate reference to	analogies, quotations from relevant authorities) make appropriate reference to	statistics, analogies, quotations from relevant authorities) make appropriate reference to	(explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make
	analogies, quotations from relevant authorities) make appropriate reference to information or	analogies, quotations from relevant authorities) make appropriate reference to information or	statistics, analogies, quotations from relevant authorities) make appropriate reference to information or	(explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to
	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	(explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that
	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the	statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the	(explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports
	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the progeneration or	statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the	(explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or
	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the	statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the	(explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the
Supp	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's	statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's	(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
Supp	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/	analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/	statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/	(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/
Supp orting Mater	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	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	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	(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

	Central message			
	is compelling			
	(precisely		Central	
	stated,	Central	message is	
	appropriately	message is	basically	Central message
Centr	repeated,	clear and	understandable	can be deduced but
al	memorable, and	consistent with	but is not often	is not explicitly
Messa	strongly	the supporting	repeated and is	stated in the
ge	supported.)	material.	not memorable.	presentation.

Date revised: August 28, 2023

Ho Chi Minh City, 28/08/2023 Dean of School of Computer Science and Engineering

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Security Technology and Implementation

Course Code: IT165IU

1. General information

Course designation	The course will concentrate on security technologies that can be employed to safeguard and maintain a network. The course will also cover risk management, business continuity and recovery planning, operations security, access control systems, and software development security.
Semester(s) in which the course is taught	7,9
Person responsible for the course	Dr. Le Hai Duong
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Computer Networks
Course objectives	This course introduces students to information security principles, cryptography systems (symmetric and public key encryptions), risk management, security architecture and design, business continuity operations security, access control systems, protecting TCP/IP network, firewalls, virtual private network, IPSec, software development security.
Course learning outcomes	CLO 1. Gain understanding of information security and the cryptography concepts including symmetric key encryption, hash

	function, message authentication code, public key encryption, digital signature and digital envelope;CLO 2. Apply the concepts of authentication and authorization in implementing secure systems and networks;CLO 3. Analyze and evaluate security risk and security design; CLO 4. Understand and apply software development security; CLO 5. Apply security technologies in operations.Competency levelCourse learning outcome (CLO)				
		Knowledge	CLO1, CLO2, CLO4	$\frac{1}{1000}$	
		Attitude		I, CLOU	_
Content	The de weigh Weigl Teach	escription of the content of the con	ntents should clearly in and the level. hours) huce); T (Teach); U (U ¹	ndicate th	e
	Top	pic		Weigh	Leve
				t	1
	Info	ormation security pr	rinciples	1	Т
	Gov	vernance and risk m	anagement;	1	T,U
	Security architecture and design; 1 T				
	Bus plar	siness continuity and nning;	d disaster recovery	1	T,U
	Ope	eration security;		2	T,U
	Acc	cess control systems	and methodology;	1	Т
	Cry	ptography;		2	T,U
	Ove secu	erview network and urity;	telecommunications	1	T,U
	Bas	ic security infrastru	ctures and routers;	1	Т
	Fire	ewalls		1	T,U
	Intr prot	usion detection syst tection systems	tems and intrusion	1	Т
	Vir	tual private network	and IPSec;	1	Т
	Sof	1	T,U		
Examination forms	Multiple-choice questions, short-answer 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	3.	William Stallings and Lawrence Brown, Computer Security - Principles and Practice 4th edition, 2018			
--------------	----	--			
	4.	Mark S. Merkow and Jim Breithaupt, Information Security: Principles and Practices, 2nd edition, 2014.			

3. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-6) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	Х		Х	Х		
2		Х				
3	Х					
4	Х					
5	Х					
6	Х					

4. Planned learning activities and teaching methods

Wee k	Торіс	CLO	Assessments	Learning activities	Resour ces
1	Information security principles	1	Quiz, Exam	Lecture, Exercises, Lab	[1,2]
2	Governance and risk management;	3	Quiz, Exam	Lecture, Lab	[2]
3	Security architecture and design;	3	Quiz, Exam	Lecture, Lab	[2]
4	Business continuity and disaster recovery planning;	3	Quiz, Exam	Lecture, Lab	[2]
5,6	Operation security;	5	Quiz, Exam	Lecture, Lab	[2]
7	Access control systems and methodology;	2		Lecture, Lab	
	Midterm exam				
8,9	Cryptography;	1	Quiz, Exam	Lecture	[1]
10	Overview network and telecommunications;	5	Quiz, Exam	Lecture, Lab	[2]
11	Basic security infrastructures and routers;	5	Quiz, Exam	Lecture, Lab	[2]
12	Firewalls	5	Quiz, Exam	Lecture, Exercises,	[1,2]

13	Intrusion detection systems and intrusion protection systems	5	Quiz, Exam	Lecture, Exercises,	[1,2]
14	Virtual private network and IPSec;	5	Quiz, Exam	Lecture, Lab	[1,2]
15	Software Development security.	4	Quiz, Exam	Lecture	[2]
	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4	CLO5
Midterm examination (30%)	30%	80%	55%		10%
Final examination (40%)	40%			75%	60%
Exercises/ Quiz (30%)	30%	20%	45%	25%	30%

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

- 2. 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.↔
- 5. Rubrics (optional)

5.1. Gradi	ing che	cklist	
Grading checklist for Writ	ten Re	ports	
Student: HW/Assignme	ent:		••••
Evaluator:	•••••		•••••
Date:			
	Max.	Score	Comments
Technical content (60%)			
Abstract clearly identifies purpose and	10		
summarizes principal content			
Introduction demonstrates thorough knowledge	15		
of relevant background and prior work			
Analysis and discussion demonstrate good	30		
subject mastery			
Summary and conclusions appropriate and	5		
complete			
Organization (10%)			
Distinct introduction, body, conclusions	5		

Content clearly and logically organized, good	5	
transitions		
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

Н	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	Miles	Milestone	
	4	3	2	1
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	
	critically is stated	to be considered	terms	
	clearly and	critically is	undefined,	
	described	stated,	ambiguities	Issue/ problem
	comprehensively,	described, and	unexplored,	to be
	delivering all	clarified so that	boundaries	considered
Explan	relevant	understanding is	undetermined,	critically is
ation	information	not seriously	and/ or	stated without
of	necessary for full	impeded by	backgrounds	clarification or
issues	understanding.	omissions.	unknown.	description.

			Information is	
			taken from	
			source(s) with	
Fuidan	Information is	Information is	some	
	source(s) with	source(s) with	avaluation but	
Ce Selectin	enough	enough	not enough to	Information is
o and	interpretation/	interpretation/	develon a	taken from
g ana using	evaluation to	evaluation to	coherent	source(s)
informa	develop a	develop a	analysis or	without any
tion to	comprehensive	coherent	svnthesis.	interpretation/
investig	analysis or	analysis or	Viewpoints of	evaluation.
ate a	synthesis.	synthesis.	experts are	Viewpoints of
point of	Viewpoints of	Viewpoints of	taken as	experts are
view or	experts are	experts are	mostly fact,	taken as fact,
conclus	questioned	subject to	with little	without
ion	thoroughly.	questioning.	questioning.	question.
			Questions	Shows an
			some	emerging
			assumptions.	awareness of
	Thoroughly		Identifies	present
	(systematically and		several	assumptions
	methodically)		relevant	(sometimes
	analyzes own and	T1 / C	contexts when	labels
Tuffuan	others'	Identifies own	presenting a	assertions as
Influen	assumptions and	and others	position. May	assumptions).
ce ol	the relevance of	assumptions and	of others'	identify some
and	contexts when	contexts when	assumptions	contexts when
anu assumn	presenting a	nresenting a	than one's own	nresenting a
tions	position	presenting a	(or vice versa)	position
tions	Specific position			position.
	(perspective.			
	thesis/ hypothesis)	Specific		
	is imaginative,	position		
	taking into account	(perspective,		
	the complexities of	thesis/hypothesi		
	an issue. Limits of	s) takes into		
	position	account the		
Studen	(perspective,	complexities of		_
t's	thesis/ hypothesis)	an issue. Others'	Specific	Specific
positio	are acknowledged.	points of view	position	position
n	Others' points of	are	(perspective,	(perspective,
(perspe	view are	acknowledged	thesis/	thesis/
ctive,	synthesized within	within position	hypothesis)	hypothesis) is
tnesis/h	position	(perspective,	acknowledges	stated, but is
ypotne sis)	(perspective, thesis/ hypothesis)	hypothesis)	of an issue	simplistic and
5157	mesis/ hypomesis).	nypomesis).	or all issue.	obvious.

			Conclusion is	
		Conclusion is	logically tied	
		logically tied to	to information	
	Conclusions and	a range of	(because	Conclusion is
Conclu	related outcomes	information,	information is	inconsistently
sions	(consequences and	including	chosen to fit	tied to some of
and	implications) are	opposing	the desired	the information
related	logical and reflect	viewpoints;	conclusion);	discussed;
outcom	student's informed	related	some related	related
es	evaluation and	outcomes	outcomes	outcomes
(implic	ability to place	(consequences	(consequences	(consequences
ations	evidence and	and	and	and
and	perspectives	implications)	implications)	implications)
conseq	discussed in	are identified	are identified	are
uences)	priority order.	clearly.	clearly.	oversimplified.

Dral communication value rubrie	for evaluating	presentation tasks:
---------------------------------	----------------	---------------------

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced
	is skillful and	clearly and	transitions) is	material within
	makes the	consistently	intermittently	the body, and
	content of the	observable	observable	transitions) is not
Organi	presentation	within the	within the	observable within
zation	cohesive.	presentation.	presentation.	the presentation.
			Language	
	Language	Language	choices are	Language choices
	choices are	choices are	mundane and	are unclear and
	imaginative,	thoughtful and	commonplace	minimally support
	memorable, and	generally	and partially	the effectiveness
	compelling, and	support the	support the	of the
	enhance the	effectiveness of	effectiveness of	presentation.
	effectiveness of	the	the	Language in
	the presentation.	presentation.	presentation.	presentation is not
Langu	Language in	Language in	Language in	appropriate to
age	presentation is	presentation is	presentation is	audience.

	appropriate to audience.	appropriate to audience.	appropriate to audience.	
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the
Dolivor	speaker appears	sneaker appears	and speaker	presentation, and
v	confident	comfortable	tentative	uncomfortable
_ y	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations from	quotations from	quotations from	statistics,
	authorities)	authorities)	authorities)	allalogies,
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities) make
	reference to	reference to	reference to	reference to
	information or	information or	information or	information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
C	establishes the	establishes the	establishes the	establishes the
suppor	presenter's	presenter's	presenter's	presenter's
ung Matari	authority on the	authority on the	authority on the	authority on the
	topic	topic	topic	topic
***	Central message		Central	10p10.
Centra	is compelling	Central	message is	Central message
1	(precisely	message is	basically	can be deduced
Messag	stated,	clear and	understandable	but is not
e	appropriately	consistent with	but is not often	explicitly stated

repeated, memorable, and	the supporting material.	repeated and is not memorable.	in the presentation.
strongly supported.)			

Source: Association of American Colleges and Universities Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

TT

Month

Assoc.Prof. Nguyen Van Sinh

Course Name: Software Quality Verification and Validation

Course Code: IT166IU

. General information			
2. Course designation	7.0		
taught	7,9		
Person responsible for the course	Tran Thanh Tung, Dr.		
Language	English		
Relation to curriculum	Elective		
Teaching methods	Lecture, lesson, project, seminar.		
Workload (incl. contact hours, self- study hours)	 (Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours: 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. 		
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1		
Required and recommended prerequisites for joining the course	Object-Oriented Programming		
Course objectives	Introduction to software verification, validation, and testing. Strategies and techniques are presented for testing software, and also for planning software testing.		
Course learning outcomes	CLO 1. Describe and explain how testing activities involve within software development process.CLO 2. Understand and apply best practices for software testing.CLO 3. Create test cases based on system requirementCompetency levelCourse learning outcome (CLO)		
	Knowledge CLO1, CLO2		

	Skill	CLO2, C	CLO3
	Attitude	CLO2	
Content	The description of the contents should clearly indicate the weighting of the content and the level. Weight: lecture session (3 hours) Teaching levels: I (Introduce); T (Teach): U (Utilize)		
	Торіс	Weight	Level
	Software Testing Overview	3	Ι
	Software Testing Foundations	3	Т
	Software Testing Activities	3	Т
	Model-Driven Test Design	3	T, U
	Test Automation	3	T, U
	Testing First Approach	3	Т
	Criteria-Based Test Design	3	Т
	Input Space Partitioning	3	Т
	Graph Coverage	3	Т
	Logic Coverage	3	Т
	Writing Test Plans	3	T, U
	Test implementation	3	T, U
Examination forms	Short-answer que	stions	
Study and examination requirements	Attendance: A mi of 80 percent is co class sessions. Stu assessed on the ba	nimum att ompulsory idents will asis of thei	tendance for the l be ir 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	 Paul Ammann, Jeff Offutt; Introduction to Software Testing, 2nd, 2017 James A. Whittaker; Exploratory Software Testing, 2009. Glendford J. Myers, Tom Badgett, Corey Sandler; The art of Software Testing, 2012. 		

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:

	SLO					
CLO	1	2	3	4	5	6
1	XX					
2		XXX				
3						Х

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessment s	Learning activities	Resources
1	Software Testing Overview	1	Quiz	Lecture	
2	Software Testing Foundations	1	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
3	Software Testing Activities	2	Quiz	Lecture, Discussion	[2]
4	Model- Driven Test Design	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
5	Test Automation	2,3	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]

6	Test Automation – Tools	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
7	Testing First Approach	2,3	Lab, Quiz, Midterm	Lecture, Discussion	
8	Criteria- Based Test Design	2,3	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
9	Midterm				
10	Input Space Partitioning – Part 1	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
11	Input Space Partitioning – Part 2	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,2,3]
12	Graph Coverage	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
13	Logic Coverage	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,3]
14	Writing Test Plans	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[2,3]
15	Test implementat ion	2,3	Lab, Quiz, Final	Lecture, Discussion	[2,3]
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz (5%)	Х	Х	
Labs (20%)		X	
Midterm examination (30%)	Х	X	X
Projects/Presentati ons/ Report (10%)		X	Х
Final examination (40%)	Х	Х	Х

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

- 2. 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.↔
- 5. Rubrics (optional)

5.1. Grading checklist					
Grading checklist for Written Reports					
Student: HW/Assignment:					
Evaluator:					
Date:					
	Max.	Score	Comments		
Technical content (60%)					
Abstract clearly identifies purpose and	10				
summarizes principal content					
Introduction demonstrates thorough knowledge	15				
of relevant background and prior work					
Analysis and discussion demonstrate good	30				
subject mastery					
Summary and conclusions appropriate and	5				
complete					
Organization (10%)					
Distinct introduction, body, conclusions	5				
Content clearly and logically organized, good	5				
transitions					
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

Holis	tic 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	auestions	in	exams:
Criticat	mmmg	ruinc	indite.	יטן	c runnung	questions	uu	caums.

	Capstone	Milestone		Benchmark
	4	3	2	1
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	
	critically is stated	to be considered	terms	
	clearly and	critically is	undefined,	
	described	stated.	ambiguities	
	comprehensively,	described, and	unexplored,	Issue/ problem
	delivering all	clarified so that	boundaries	to be considered
	relevant	understanding is	undetermined.	critically is
Explana	information	not seriously	and/ or	stated without
tion of	necessary for full	impeded by	backgrounds	clarification or
issues	understanding.	omissions.	unknown.	description.
	0		Information is	L. L
			taken from	
			source(s) with	
	Information is	Information is	some	
Evidenc	taken from	taken from	interpretation/	
e	source(s) with	source(s) with	evaluation, but	
Selecting	enough	enough	not enough to	
and	interpretation/	interpretation/	develop a	Information is
using	evaluation to	evaluation to	coherent	taken from
informati	develop a	develop a	analysis or	source(s)
on to	comprehensive	coherent	synthesis.	without any
investiga	analysis or	analysis or	Viewpoints of	interpretation/
te a	synthesis.	synthesis.	experts are	evaluation.
point of	Viewpoints of	Viewpoints of	taken as	Viewpoints of
view or	experts are	experts are	mostly fact,	experts are taken
conclusi	questioned	subject to	with little	as fact, without
on	thoroughly.	questioning.	questioning.	question.
Influenc	Thoroughly		Questions	Shows an
e of	(systematically and	Identifies own	some	emerging
context	methodically)	and others'	assumptions.	awareness of
and	analyzes own and	assumptions and	Identifies	present
assumpt	others'	several relevant	several	assumptions
ions	assumptions and	contexts when	relevant	(sometimes

	carefully evaluates the relevance of contexts when presenting a position.	presenting a position.	contexts when presenting a position. May be more aware of others' assumptions than one's own	labels assertions as assumptions). Begins to identify some contexts when presenting a position.
			(or vice versa).	
Student' s position (perspec tive, thesis/hy pothesis)	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/hypothesi s) 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.
Conclusi ons and related outcome s (implica tions and consequ	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are

Oral communication value rubric for evaluating presentation tasks:

Capstone	Milestone		Benchmark
4	3	2	1

	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	
	the body, and	and conclusion,	introduction	Organizational
	transitions) is	sequenced	and conclusion,	pattern (specific
	clearly and	material within	sequenced	introduction and
	consistently	the body, and	material within	conclusion,
	observable and	transitions) is	the body, and	sequenced material
	is skillful and	clearly and	transitions) is	within the body,
	makes the	consistently	intermittently	and transitions) is
	content of the	observable	observable	not observable
Organiz	presentation	within the	within the	within the
ation	cohesive.	presentation.	presentation.	presentation.
			Language	
	Language	Language	choices are	
	choices are	choices are	mundane and	
	imaginative,	thoughtful and	commonplace	
	memorable, and	generally	and partially	Language choices
	compelling, and	support the	support the	are unclear and
	enhance the	effectiveness of	effectiveness of	minimally support
	effectiveness of	the	the	the effectiveness of
	the presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is not
Languag	appropriate to	appropriate to	appropriate to	appropriate to
e	audience.	audience.	audience.	audience.
	Delivery		Delivery	
	techniques	Delivery	techniques	Delivery
	(posture,	techniques	(posture,	techniques
	gesture, eye	(posture,	gesture, eye	(posture, gesture,
	contact, and	gesture, eye	contact, and	eye contact, and
	vocal	contact, and	vocal	vocal
	expressiveness)	vocal	expressiveness)	expressiveness)
	make the	expressiveness)	make the	detract from the
	presentation	make the	presentation	understandability
	compelling, and	presentation	understandable,	of the presentation,
	speaker appears	interesting, and	and speaker	and speaker
	polished and	speaker appears	appears	appears
Deliverv	confident.	comfortable.	tentative.	uncomfortable.

1	1	1	1	1
	A variety of			
	types of			
	supporting	Supporting	Supporting	
	materials	materials	materials	
	(explanations,	(explanations,	(explanations,	Insufficient
	examples,	examples,	examples,	supporting
	illustrations,	illustrations,	illustrations,	materials
	statistics,	statistics,	statistics,	(explanations,
	analogies,	analogies,	analogies,	examples,
	quotations from	quotations from	quotations from	illustrations,
	relevant	relevant	relevant	statistics,
	authorities)	authorities)	authorities)	analogies,
	make	make	make	quotations from
	appropriate	appropriate	appropriate	relevant
	reference to	reference to	reference to	authorities) make
	information or	information or	information or	reference to
	analysis that	analysis that	analysis that	information or
	significantly	generally	partially	analysis that
	supports the	supports the	supports the	minimally supports
	presentation or	presentation or	presentation or	the presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
Support	i credibility/	credibility/	credibility/	credibility/
ng	authority on the	authority on the	authority on the	authority on the
Materia	l topic.	topic.	topic.	topic.
	Central message			
	is compelling			
	(precisely		Central	
	stated,	Central	message is	
	appropriately	message is	basically	Central message
	repeated,	clear and	understandable	can be deduced but
	memorable, and	consistent with	but is not often	is not explicitly
Central	strongly	the supporting	repeated and is	stated in the
Message	supported.)	material.	not memorable.	presentation.

Source: Association of American Colleges and Universities Date revised: August 29th, 2023

Ho Chi Minh City, 29/08/2023 Dean of School of Computer Science and Engineering

Assoc.Prof. Nguyen Van Sinh

Course Name: Game Development

Course Code: IT167IU

1. General info	ormation	1. General information							
Course designation	This course is an introduct process of designing games a	ion to the theory and practice of the and playful experiences.							
Semester(s) in which the course is taught	7,9								
Person responsible for the course	Dr. Le Duy Tan								
Language	English	English							
Relation to curriculum	Compulsory								
Teaching methods	Lecture								
Workload (incl. contact hours, self-study hours)	Total workload: 182.5 hours Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Lecture: 37.5 hours + Laboratory: 25 hours. Private study including examination preparation, specified in hours: 120 hours.								
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1								
Required and recommended prerequisites for joining the course	Object Oriented Programmir	ng							
Course objectives	This course is an introduction process of designing games familiarized with methods, co- in the design of games. The on aspects such as: Rapid iteration using a player-center	ion to the theory and practice of the and playful experiences. Students are oncepts, techniques, and literature used strategy is process-oriented, focusing prototyping, play testing, and design ered approach.							
Course learning outcomes	CLO 1. Understand the emergence of the academic study of design methods and game design.CLO 2. Able to structure and conduct a game design project from conceptualization to playable prototype.CLO 3. Solve a real-world problem using game design knowledge through group collaboration.								
	Competency level	Course learning outcome (CLO)							

	Knowledge	1		
	Skill	2, 3		
	Attitude	3		
Content	The description of the conte	nts should clearly ind	dicate the	
	weighting of the content and	l the level.		
	Weight: lecture session (3 h	ours)		
	Teaching levels: I (Introduc	e); T (Teach); U (Uti	lize)	. <u> </u>
	Торіс		Weigh	Level
			t	
	Introduction to Game Dev	elopment	1	Ι
	Platforms and Publishing		3	Т
	Game Development Cycle		3	T, U
	Principles of Game Design	1	3	T, U
	Trade-Offs in Game Desig	'n	2	T, U
	Game Engines, Game Syst Map and Level Editors	2	Т	
	Games Marketing and Dist	1	Т	
Examination forms	Short-answer questions, Pro	gramming exercises		
Study and	Attendance: A minimum atte	endance of 80 percent	t is compu	llsory for
examination	the class sessions. Students	will be assessed on	the basis	of their
requirements	class participation. Ques	tions and commen	nts are	strongly
-	encouraged.			
	Assignments/Examination:	Students must have n	nore than	50/100
	points overall to pass this co	ourse.		
Reading list	8. Nystrom, Robert. Ga Benning, 2014.	me programming pat	terns. Gei	never
	9. Gregory, Jason. Gam	e engine architecture	. crc Pres	s, 2018.

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

CLO\SL OT	1	2	3	4	5	6
1	Х					
2		XXX				
3						Х

	3. Planned learning activities and teaching methods							
Wee	Торіс	CLO	Assessment	Learning	Resour			
k			S	activities	ces			
1	Introduction to Game Development	1	Quiz	Lecture	1			

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2	Platforms and Publishing – Part 1	1	Quiz	Lecture	1
3	Platforms and Publishing – Part 2	1	Quiz	Lecture, Discussion , In-class Exercise	2
4	Platforms and Publishing – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
5	Game Development Cycle – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
6	Game Development Cycle – Part 2	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	2
7	Game Development Cycle – Part 3	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
8	Principles of Game Design – Part 1	2, 3	Quiz, Lab, Midterm	Lecture, Discussion , In-class Exercise	1
Midte	rm				
9	Principles of Game Design – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
10	Principles of Game Design – Part 3	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
11	Trade-Offs in Game Design – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
12	Trade-Offs in Game Design – Part 2	2,3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
13	Game Engines, Game Systems and Elements; Map and Level Editors – Part 1	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1, 2

14	Game Engines, Game Systems and Elements; Map and Level Editors – Part 2	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
15	Games Marketing and Distribution	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
Final					

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz / Assigment (10%)	50%	10%	10%
Labs (20%)	10%	30%	30%
Midterm examination (30%)	30%	30%	30%
Final examination (40%)	10%	30%	30%

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	n Repo	rts			
Student: HW/Assignment:					
Date: Evaluator:					
	Max.	Score	Comments		
Technical content (60%)					
Abstract clearly identifies purpose and summarizes	10				
principal content					
Introduction demonstrates thorough knowledge of	15				
relevant background and prior work					
Analysis and discussion demonstrate good subject					
mastery					
Summary and conclusions appropriate and complete	5				
Organization (10%)					
Distinct introduction, body, conclusions	5				
Content clearly and logically organized, good					
transitions					
Presentation (20%)					
Correct spelling, grammar, and syntax	10				

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Clear and easy to read	10	
Quality of Layout and Graphics (10%)	10	
TOTAL SCORE	100	

5.2. Holistic rubric

Hol	istic rubric for evaluating the entire document, e.g., exercises/quizzes/HW
Scor	Description
e	
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	Miles	Milestone	
	4	3	2	1
			Issue/ problem	
			to be	
			considered	
			critically is	
			stated but	
	Issue/ problem to		description	
	be considered	Issue/ problem	leaves some	Issue/
	critically is stated	to be considered	terms	problem to
	clearly and	critically is	undefined,	be
	described	stated,	ambiguities	considered
	comprehensively,	described, and	unexplored,	critically is
	delivering all	clarified so that	boundaries	stated
	relevant	understanding is	undetermined,	without
	information	not seriously	and/ or	clarification
Explanation	necessary for full	impeded by	backgrounds	or
of issues	understanding.	omissions.	unknown.	description.

Evidence Selecting and using information to investigate a point of view or conclusion	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 interpretatio n/ 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/hypot	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	Specific position (perspective, thesis/hypothesi s) 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	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious

	(perspective, thesis/ hypothesis).			
			Conclusion is	Conclusion
		Conclusion is	logically tied	is
		logically tied to	to information	inconsistentl
	Conclusions and	a range of	(because	y tied to
	related outcomes	information,	information is	some of the
	(consequences and	including	chosen to fit	information
	implications) are	opposing	the desired	discussed;
	logical and reflect	viewpoints;	conclusion);	related
Conclusions	student's informed	related	some related	outcomes
and related	evaluation and	outcomes	outcomes	(consequenc
outcomes	ability to place	(consequences	(consequences	es and
(implication	evidence and	and	and	implications
s and	perspectives	implications)	implications)) are
consequence	discussed in	are identified	are identified	oversimplifi
s)	priority order.	clearly.	clearly.	ed.

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizational			
	pattern (specific			
	introduction and	Organizational		
	conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	Organizational
	material within	introduction	(specific	pattern
	the body, and	and conclusion,	introduction	(specific
	transitions) is	sequenced	and conclusion,	introduction
	clearly and	material within	sequenced	and conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is
	content of the	observable	observable	not observable
Organizatio	presentation	within the	within the	within the
n	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful and	mundane and	unclear and
	memorable, and	generally	commonplace	minimally
Language	compelling, and	support the	and partially	support the

Oral	communication	value rubric	for	evaluating	presentation	tasks:
Ului	communication	rune mone	<i>jvi</i>	crainanns.	presentation	insits.

	enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	effectiveness of the presentation. Language in presentation is appropriate to audience.	support the effectiveness of the presentation. Language in presentation is appropriate to audience.	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 understandabili ty of the presentation, and speaker appears uncomfortable.
Supporting	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	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	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	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
Material	topic.	topic.	topic.	the topic.

	Central message is compelling (precisely stated, appropriately	Central message is	Central message is basically	Central message can be
	repeated,	clear and	understandable	deduced but is
	memorable, and	consistent with	but is not often	not explicitly
Central	strongly	the supporting	repeated and is	stated in the
Message	supported.)	material.	not memorable.	presentation.

Date revised: August 28, 2023

Ho Chi Minh City, 28/08/2023 Dean of School of Computer Science and Engineering

Month Ξ

Assoc.Prof. Nguyen Van Sinh

Course Name: Blockchain

Course Code: IT150IU

1. General information

Course designation	Introduction to Blockchain technology
Semester(s) in which the course is taught	6,7
Person responsible for the course	Tran Thanh Tung, Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours: 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.
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	None
Course objectives Course learning outcomes	This subject introduces the students the foundation of blockchain technology and its applications. Students will study blockchain concepts and principles how it works. This course covers relevant topics blockchain space. The course starts with the basics of blockchain, cryptography, fundamental understanding of bitcoins. Then, the applications of blockchain technology is introduced in different areas of finance, healthcare, supply chain, etc. A complete picture of the ecosystem surrounding blockchain technology and development trends are also discussed. CLO 1. Understand basic contents of blockchain technology. CLO 2. Explain different types of blockchain development: Ethereum, smart contract security, bitcoin CLO 3. Apply blockchain techniques to setup the development environment to writing and deploying smart contracts, the workhorse of blockchain applications, integrating cryptocurrency micropayments into web apps CLO 4. Work in a team to build a blockchain application project.

	1					
		Competency level	Course learning ou	itcome (C	CLO)	
		Knowledge	CLO1, CLO1			
		Skill	CLO3, CLO4			
		Attitude	CLO2			
Content	The weig	description of the co ghting of the content	ntents should clearly and the level.	indicate t	he	
	We	ight: lecture session (3 hours)			
	Tea	ching levels: I (Introc	luce); T (Teach); U (Utilize)		
		Тор	bic	Weight	Level	
	I	ntroduction		3	Ι	
	C	Cryptography & crypt	ocurrencies	3	Т	
	H	Iow Bitcoin achieve	decentralization	3	I, T	
	Ν	Aechanics of Bitcoin		3	T, U	
	H	How to store and use I	Bitcoin	3	T, U	
	E	Bitcoin mining		3	Т	
	E	Bitcoin and Anonymit	y	3	Т	
	E	Ethereum		3	I, T	
	S	olidity		3	T, U	
	Г	Token		3	I, T	
	C	Dracle		3	I, T	
	Ι	Decentralized Applica	tions (Dapps)	3	T, U	
	Γ	Design pattern for blo	ckchain applications	3	Т	
	F	Real-world application	ns	3	I, T	
Examination forms	Mu	ltiple-choice question	s, short-answer quest	ions		
Study and	Atte	endance: A minimum	attendance of 80 per	cent is cor	npulsory	
examination	for 1	the class sessions. Stu	idents will be assesse	d on the b	asis of	
requirements	thei	r class participation.	Questions and commo	ents are st	rongly	
	Ass	ignments/Examinatio	on: Students must hav	e more tha	an 50/100	
	poir	nts overall to pass this	s course.			
Reading list	[1]	Arvind Narayanar	n, Joseph Bonneau, E	dward Fel	ten,	
	And	Irew Miller, and Stev	en Goldfeder. Bitcoir	i and	notion	
	Prir	procurrency recimon	ogles: A Comprehens	ive mirou	uction.	
	[2]	Andreas M. Antor	nopoulos, and Gavin	Wood Ph.	D.	
	Mas	stering Ethereum: Bu	ilding Smart Contract	ts and DA	pps.	
	O'R	eilly Media, 2018	7 1 1 2 7 4 ~ ~			
	[3]	Xiwei Xu, Ingo W	eber, and Mark Stap	les. Archit	tecture for	
	Blockchain Applications. Springer, 2019.					

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:

	SLO					
CLO	1	2	3	4	5	6
1	Х					
2	Х	Χ				
3		Х				Х
4						Х

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction	1	Quiz	Teaching, Presentation	
2	Cryptography & cryptocurrencies	1	Quiz, In-class exercises	Teaching, Presentation	
3	How Bitcoin achieve decentralization	1, 2	Quiz, In-class exercises	Teaching, Presentation	
4	Mechanics of Bitcoin	1, 2	Quiz, In-class exercises	Teaching, Presentation	
5	How to store and use Bitcoin	1, 2	Quiz, In-class exercises	Teaching, Presentation	
6	Bitcoin mining	1, 2	Quiz, In-class exercises	Teaching, Presentation	
7	Bitcoin and Anonymity	2	Quiz, In-class exercises	Teaching, Presentation	
8	Midterm				
9	Ethereum	2,3	Project	Teaching, Presentation	
10	Solidity	2,3	Project	Teaching, Presentation	
11	Token	3,4	Quiz, In-class exercises	Teaching, Presentation	
12	Oracle	2,3	Quiz, In-class exercises	Teaching, Presentation Group discussion	
13	Decentralized Applications (Dapps)	3,4	Quiz, In-class exercises	Teaching, Presentation	

Week	Торіс	CLO	Assessments	Learning activities	Resources
14	Design pattern for blockchain applications	3,4	Quiz, In-class exercises	Teaching, Presentation, In-class reading	
15	Real-world applications	3,4	Presentation	Teaching, Presentation Group discussion	
16	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (20%)			х	х
Midterm examination (30%)	Х	х		
Final examination (40%)		х	X	
Exercises/ Quiz (10%)	Х			

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

- 2. 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.
- 5. Rubrics (optional)

5.2. Grading checklist

Grading checklist for Written Reports					
Student:	HW/	HW/Assignment:			
Date:	•••••				
	Evaluator:				
		<u></u>			
	Max.	Score	Comments		
Technical content (60%)					
Abstract clearly identifies purpose and summarizes	10				
principal content					
Introduction demonstrates thorough knowledge of	15				
relevant background and prior work					
Analysis and discussion demonstrate good subject	30				
mastery					
Summary and conclusions appropriate and complete	5				
Organization (10%)					
Distinct introduction, body, conclusions	5				

Content clearly and logically organized, good	5	
transitions		
Presentation (20%)		
Correct spelling, grammar, and syntax	10	
Clear and easy to read	10	
Quality of Layout and Graphics (10%)	10	
TOTAL SCORE	100	

5.3. Holistic rubric

Holi	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.

5.4. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milest	one	Benchmark
	4	3	2	1
			Issue/	
			problem to	
			be	
		considered		
			critically is	
	Issue/ problem	stated but		
	to be considered		description	
	critically is	Issue/ problem leaves some		
	stated clearly	to be considered terms		
	and described	critically is undefined.		Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.

			If	
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develon a	analysis or	without any
Fyidanca	comprehensive	coherent	synthesis	interpretation/
Evidence Solooting and			Viewneinte	avaluation
Selecting and			viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.
			Questions	
			some	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position	assertions as
	assumptions	Identifies own	May be more	assumptions)
	and carefully	and others'	aware of	Begins to
	and carefully	and others	aware of	identify some
		assumptions and	ouners	identify some
T	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific	Specific		
	position	position		
	(perspective,	(perspective,		
	thesis/	thesis/hypothesi		
	hypothesis) is	s) takes into	Specific	a
	ımagınative,	account the	position	Specific
	taking into	complexities of	(perspective,	position
	account the	an issue. Others'	thesis/	(perspective,
Student's	complexities of	points of view	hypothesis)	thesis/
position	an issue. Limits	are	acknowledge	hypothesis) is
(perspective,	of position	acknowledged	s different	stated, but is
thesis/hypothesi	(perspective,	within position	sides of an	simplistic and
s)	thesis/	(perspective,	issue.	obvious.

	hypothesis) are	thesis/			
	acknowledged.	hypothesis).			
	Others' points of				
	view are				
	synthesized				
within position					
	(perspective,				
	thesis/				
	hypothesis).				
			Conclusion		
			is logically		
	Conclusions		tied to		
	and related	Conclusion is	information	Conclusion is	
	outcomes	logically tied to	(because	inconsistently	
	(consequences	a range of	information	tied to some	
	and	information,	is chosen to	of the	
	implications)	including	fit the	information	
are logical and		opposing	desired	discussed;	
	reflect student's	viewpoints;	conclusion);	related	
	informed	related	some related	outcomes	
Conclusions	evaluation and	outcomes	outcomes	(consequence	
and related	ability to place	(consequences	(consequence	s and	
outcomes	evidence and	and	s and	implications)	
(implications	perspectives	implications)	implications)	are	
and	discussed in	are identified	are identified	oversimplifie	
consequences)	priority order.	clearly.	clearly.	d.	

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Milestone		Benchmark	
	4	3	2	1	
	Organizational				
	pattern				
	(specific				
	introduction	Organizational			
	and conclusion,	pattern	Organizational		
	sequenced material within		pattern		
			(specific	Organizational	
	the body, and	and conclusion,	introduction	pattern (specific	
	transitions) is	sequenced	and conclusion,	introduction and	
	clearly and	material within	sequenced	conclusion,	
	consistently	the body, and	material within	sequenced	
	observable and	transitions) is	the body, and	material within the body, and	
	is skillful and	clearly and	transitions) is		
	makes the	consistently	intermittently	transitions) is not	
	content of the	observable	observable	observable	
	presentation	within the	within the	within the	
Organization	cohesive.	presentation.	presentation.	presentation.	

	Language				
	choices are				
	imaginative,		Language		
	memorable,	Language	choices are		
	and	choices are	mundane and	Language	
	compelling.	thoughtful and	commonplace	choices are	
	and enhance	generally	and partially	unclear and	
	the	support the	support the	minimally	
	effectiveness	effectiveness	effectiveness of	support the effectiveness of the presentation. Language in presentation is	
	of the	of the	the		
	presentation	presentation	nresentation		
	I anguage in	I anguage in	I anguage in		
	presentation is	presentation is	presentation is		
	appropriate to	appropriate to	appropriate to	not appropriate	
Ιοησμοσο	appropriate to	appropriate to	audience	to audience	
Danguage	Delivery	addrenee.	addrenee.	to addrenee.	
	techniques	Delivery	Delivery		
	(posture.	techniques	techniques	Deliverv	
	gesture, eve	(posture.	(posture.	techniques	
	contact, and	gesture, eve	gesture, eve	(posture, gesture,	
	vocal	contact and	contact and	eve contact and	
	expressiveness)	vocal	vocal	vocal	
	make the	expressiveness)	expressiveness)	expressiveness)	
	presentation	make the	make the	detract from the	
	compelling	nresentation	nresentation	understandability of the	
	and sneaker	interesting and	understandable		
	annears	sneaker	and speaker	presentation and	
	polished and	appears	annears	speaker appears	
Delivery	confident	comfortable	tentative	uncomfortable	
Denvery	A variety of	Supporting	Supporting	Insufficient	
	types of	materials	materials	supporting	
	supporting	(explanations	(explanations	materials	
	materials	examples.	examples.	(explanations.	
	(explanations.	illustrations.	illustrations.	examples.	
	examples, statistics, statistics, illustrations, examples, statistics, statist		illustrations.		
			statistics,		
	statistics.	auotations analogies, analogies,		analogies,	
	analogies.	from relevant	from relevant auotations from		
	quotations authorities) authorities) relev		relevant		
	from relevant	om relevant make make authorities		authorities)	
authorities) appropriate app		appropriate	make reference		
	make	reference to	reference to	to information or	
	appropriate	information or	information or	analysis that	
	reference to analysis that analysis that information or generally generally supports the supports the supports the supports the supports the support the support of the support the support of the suppor		minimally		
			supports the		
			presentation or		
Supporting	significantly	presentation or	presentation or	establishes the	
Material	supports the	establishes the	establishes the	presenter's	

	presentation or establishes the presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	presenter's credibility/ authority on the topic.	credibility/ authority on the topic.
	Central message is compelling (precisely stated, appropriately repeated, memorable,	Central message is clear and consistent with	Central message is basically understandable but is not often	Central message can be deduced but is not explicitly stated
Central Message	and strongly supported.)	the supporting material.	repeated and is not memorable.	in the presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Assoc.Prof. Nguyen Van Sinh

Course Name: Development and Operations (DevOps)

Course Code: IT156IU

1. General information

1. General information			
Course designation	This course is an introduction to DevOps to help students understand its principles and practices. Key concepts and terminology will be covered with real-life case studies, examples and practical exercises. Common and popular tools to achieve DevOps models will be introduced as well.		
Semester(s) in which the course is taught	7,8		
Person responsible for the course	Tran Thanh Tung, PhD.		
Language	English		
Relation to curriculum	Elective (NE)		
Teaching methods	Lecture, lesson, project, seminar.		
Workload (incl. contact hours, self- study hours)	Total workload: 195 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 (lecture) + 30 (laboratory) Private study including examination preparation, specified in hours: 120		
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1		
Required and recommended prerequisites for joining the course	None		
Course objectives	This course is an introduction to DevOps to help students understand its principles and practices. Key concepts and terminology will be covered with real-life case studies, example and practical exercises. Common and popular tools to achieve DevOps models will be introduced as well.		
Course learning outcomes	CLO 1. Define and discuss the key concepts and principles of DevOps CLO 2 Explain the benefit of DevOps and continuous delivery CLO 3 Understand infrastructure automation, build and deployment automation, the transformation to DevOps models CLO 4. Work with common and popular DevOps tools		

		Competency level	Course learning out	come (CI	.0)	
		Knowledge	1,2			
		Skill	3,4			
		Attitude	4			
Content	The	description of the co	ntents should clearly i	ndicate th	e	
	wei	ghting of the content	and the level.			
	We	ight: lecture session ($\frac{3}{2}$ hours)	It:1:		
		ching levels: 1 (Introc	luce); 1 (1each); 0 (0	Weight	Loval	
			pic Weight Leve			
	Int	roduction to DevOps		3	I	
	Int	roduction to Cloud C	Computing	3		
	Li	nux Basics and Shell Scripting		3	Τ,Ο	
	Ve	ersioning and Build T	ool	3	Т	
	Au Co	tomation: Continuou ontinuous Deploymen	3	Т		
	Co	onfiguration Managen	nent	3	I,T	
	Co	ontainers, Container v	s Virtual Machine	3	I,T	
	De	ployment pipeline		3	I,T	
	Po	st production		3	I,T	
	Di	saster recovery		3	Ι	
	Co	ntinuous Monitoring for DevOps		3	I,T	
	Int	nfrastructure and deployment security 3			Ι	
Examination forms	Short-answer questions					
Study and	Attendance: A minimum attendance of 80 percent is compulsory					
examination	for the class sessions. Students will be assessed on the basis of					
requirements	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] Jeffery D.Smith, Operations Anti-Patterns, DevOps Solutions, Manning Publications 2020					
	[2] Nicole Forsgren, Accelerate: The Science of Lean Software and DevOps: Building and Scaling High Performing Technology Organizations, IT Revolution Press 2018					
	[3] Jez Humble and David Farley. Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment Automation, Addison-Wesley Professional, 2010					
	[4] Paul M. Duvall, Steve Matyas, Andrew Glover. Continuous Integration: Improving Software Quality and Reducing Risk,					
Addison-Wesley	Professional,	2007Len	Bass	and	John	Klein.
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Deployment and	Operations for	Software	Engin	leers,	2019	

2. Learning Outcomes Matrix

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	1	2	3	4	5	6
1	Х					
2	X					
3		X				
4						X

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Introduction to DevOps				
2,3	Introduction to Cloud Computing				
4,5	Linux Basics and Shell Scripting				
6	Versioning and Build Tool				
7	Automation: Continuous Integration, Continuous Deployment				
8	Configuration Management				
Midter	'm exam				
9,10	Containers, Container vs Virtual Machine				
11	Deployment pipeline				
12	Post production				
13	Disaster recovery				
14	Continuous Monitoring for DevOps				
15	Infrastructure and deployment security				
Final e	exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
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Quiz (5%)	10%		20%	20%
Labs (10%)	30%	30%		
Midterm examination (30%)	50%	40%		
Projects/Presentations/ Report (15%)	10%		30%	30%
Final examination (40%)		30%	50%	50%

Rubrics (optional) Grading checklist

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

5.5. Holistic rubric

Holi	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.

5.6.

Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
			Issue/	
			problem to	
			be	
			considered	
			critically is	
	Issue/ problem		stated but	
	to be considered		description	
	critically is	Issue/ problem	leaves some	
	stated clearly	to be considered	terms	
	and described	critically is	undefined,	Issue/
	comprehensivel	stated,	ambiguities	problem to be
	y, delivering all	described, and	unexplored,	considered
	relevant	clarified so that	boundaries	critically is
	information	understanding is	undetermine	stated without
	necessary for	not seriously	d, and/ or	clarification
Explanation of	full	impeded by	backgrounds	or
issues	understanding.	omissions.	unknown.	description.
			Information	
			is taken from	
			source(s)	
			with some	
	Information is	Information is	interpretation	
	taken from	taken from	/ evaluation,	
	source(s) with	source(s) with	but not	
	enough	enough	enough to	Information is
	interpretation/	interpretation/	develop a	taken from
	evaluation to	evaluation to	coherent	source(s)
	develop a	develop a	analysis or	without any
Evidence	comprehensive	coherent	synthesis.	interpretation/
Selecting and	analysis or	analysis or	Viewpoints	evaluation.
using	synthesis.	synthesis.	of experts are	Viewpoints of
information to	Viewpoints of	Viewpoints of	taken as	experts are
investigate a	experts are	experts are	mostly fact,	taken as fact,
point of view or	questioned	subject to	with little	without
conclusion	thoroughly.	questioning.	questioning.	question.

			Questions	
			Questions	
			some	Charry an
			assumptions.	Shows an
	T 1 11		Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	and		contexts	assumptions
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions	Identifies own	May be more	assumptions).
	and carefully	and others'	aware of	Begins to
	evaluates the	assumptions and	others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	presenting u	presenting a	versa)	presenting u
assumptions	Specific	P0010011.	, cibuj.	position.
	position			
	(nerspective			
	thesis/			
	hypothesis) is			
	imoginativo			
	taking into			
		Sussifie		
	account the	Specific		
		position		
	an issue. Limits	(perspective,		
	of position	thesis/nypotnesi		
	(perspective,	s) takes into		
	thesis/	account the	a	
	hypothesis) are	complexities of	Specific	~
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
position	within position	within position	acknowledge	hypothesis) is
(perspective,	(perspective,	(perspective,	s different	stated, but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.
	Conclusions	Conclusion is	Conclusion	Conclusion is
	and related	logically tied to	is logically	inconsistently
	outcomes	a range of	tied to	tied to some
Conclusions	(consequences	information,	information	of the
and related	and	including	(because	information
outcomes	implications)	opposing	information	discussed;
(implications	are logical and	viewpoints;	is chosen to	related
and	reflect student's	related	fit the	outcomes
consequences)	informed	outcomes	desired	(consequence

evaluation and	(consequences	conclusion);	s and
ability to place	and	some related	implications)
evidence and	implications)	outcomes	are
perspectives	are identified	(consequence	oversimplifie
discussed in	clearly.	s and	d.
discussed in priority order.	clearly.	s and implications) are identified clearly.	

Oral communication value rubric for evaluating presentation tasks:

	Capstone	Mile	Milestone	
	4	3	2	1
	Organizational			
	pattern			
	(specific			
	introduction	Organizational		
	and conclusion,	pattern	Organizational	
	sequenced	(specific	pattern	
	material within	introduction	(specific	Organizational
	the body, and	and conclusion,	introduction	pattern (specific
	transitions) is	sequenced	and conclusion,	introduction and
	clearly and	material within	sequenced	conclusion,
	consistently	the body, and	material within	sequenced
	observable and	transitions) is	the body, and	material within
	is skillful and	clearly and	transitions) is	the body, and
	makes the	consistently	intermittently	transitions) is not
	content of the	observable	observable	observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language			
	choices are			
	imaginative,		Language	
	memorable,	Language	choices are	
	and	choices are	mundane and	Language
	compelling,	thoughtful and	commonplace	choices are
	and enhance	generally	and partially	unclear and
	the	support the	support the	minimally
	effectiveness	effectiveness	effectiveness of	support the
	of the	of the	the	effectiveness of
	presentation.	presentation.	presentation.	the presentation.
	Language in	Language in	Language in	Language in
	presentation is	presentation is	presentation is	presentation is
_	appropriate to	appropriate to	appropriate to	not appropriate
Language	audience.	audience.	audience.	to audience.

	Delivery			
	techniques	Delivery	Delivery	
	(posture.	techniques	techniques	Delivery
	gesture, eve	(posture.	(posture.	techniques
	contact and	gesture eve	gesture eve	(posture gesture
	vocal	contact and	contact and	eve contact and
	expressiveness)	vocal	vocal	vocal
	make the	expressiveness)	expressiveness)	evnressiveness)
	nresentation	make the	make the	detract from the
	appresentation	make the	make the	understendebility
	compeniing,	interacting and	understandable	of the
		micresting, and	and an aplan	of the
	appears	speaker	and speaker	presentation, and
Daliman	polished and	appears	appears	speaker appears
Delivery	confident.	comfortable.	tentative.	uncomfortable.
	A variety of			
	types of		a .:	
	supporting	Supporting	Supporting	T COL
	materials	materials	materials	Insufficient
	(explanations,	(explanations,	(explanations,	supporting
	examples,	examples,	examples,	materials
	illustrations,	illustrations,	illustrations,	(explanations,
	statistics,	statistics,	statistics,	examples,
	analogies,	analogies,	analogies,	illustrations,
	quotations	quotations	quotations	statistics,
	from relevant	from relevant	from relevant	analogies,
	authorities)	authorities)	authorities)	quotations from
	make	make	make	relevant
	appropriate	appropriate	appropriate	authorities)
	reference to	reference to	reference to	make reference
	information or	information or	information or	to information or
	analysis that	analysis that	analysis that	analysis that
	significantly	generally	partially	minimally
	supports the	supports the	supports the	supports the
	presentation or	presentation or	presentation or	presentation or
	establishes the	establishes the	establishes the	establishes the
	presenter's	presenter's	presenter's	presenter's
	credibility/	credibility/	credibility/	credibility/
Supporting	authority on	authority on	authority on	authority on the
Material	the topic.	the topic.	the topic.	topic.
	Central			
	message is		Central	
	compelling	Central	message is	Central message
	(precisely	message is	basically	can be deduced
	stated,	clear and	understandable	but is not
	appropriately	consistent with	but is not often	explicitly stated
Central	repeated,	the supporting	repeated and is	in the
Message	memorable,	material.	not memorable.	presentation.

and strongly supported.)	
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Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Т

Nout

Assoc.Prof. Nguyen Van Sinh

Course Name: Data Science and Visualization

1. General information					
Course designation	Introduction to Data Visu	alization			
Semester(s) in which the course is taught	4,6				
Person responsible for the course	Tran Thanh Tung, Dr.				
Language	English				
Relation to curriculum	Compulsory / elective / s programmes with which	pecialisation Names of other study the module is shared			
Teaching methods	Lecture, lesson, project,	seminar.			
Workload (incl. contact hours, self- study hours)	(Estimated) Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): Private study including examination preparation, specified in hours: 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.				
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1				
Required and recommended prerequisites for joining the course	Prerequisite course of Data Science and Data Visualization				
Course objectives	The goal of this course is to introduce students to the key principles, methods, and techniques for effective visual analysis of data. The course begins with aims and key principles of data visualization. The course continues with different aspects of visualization including techniques and method for presenting different data types, and for discussing and analyzing visualizations. Thorough the course, students will be introduced to many visualization systems and visual tools via hand-on exercises.				
Course learning outcomes	CLO 1. Understand the principles of data and graphic design.CLO 2. Create well-designed data visualizations with appropriate tools.CLO 3. Evaluate a visualization design.				
	Competency level	Course learning outcome (CLO)			
	Knowledge	CLO1			
	Skill	CLO2, CLO3			
	Attitude	CLO3			

Course Code: IT138IU

Content	The description of the contents should clearly	indicate t	he			
	weighting of the content and the level.					
	Weight: lecture session (3 hours)					
	Teaching levels: I (Introduce); T (Teach); U (Utilize)	· · · · · · · · · · · · · · · · · · ·			
	Торіс	Weight	Level			
	Visualization design principles	3	I, T			
	Perception, Cognition, Color	3	Т			
	Data abstraction, data types	I, T				
	Visual encoding with marks and channels	3	T, U			
	Tasks and Interactivity	3	Т			
	Validation and visualization	3	Т			
	Arrange text and sets	3	Т			
	Arrange spatial data	3	Т			
	Arrange tree and graphs/networks	3	Т			
	Facets and views	3	Т			
	Focus+Context	3	Т			
	Filtering and Aggregation	3	Т			
Examination forms	Multiple-choice questions, short-answer quest	tions				
Study and	Attendance: A minimum attendance of 80 per	cent is con	npulsory			
examination	for the class sessions. Students will be assesse	d on the b	basis of			
requirements	their class participation. Questions and commo	ents are st	rongly			
	encouraged.	a more the	n = 50/100			
	points overall to pass this course		all 30/100			
Reading list	[1] Edward R. Tufte. The Visual Display of	of Ouantita	ative			
C	Information 2nd, 2001					
	[2] Tamara Munzner, Visualization Analys	sis and De	sign 1st,			
	2014					
	[3] Colin Ware, Visual Thinking for Desig	n 1st, 200	4			
	[4] Scott Murray, Interactive Data Visualiz	tion for	the Web			
	1st, 2013	intro du oti	on to			
	[5] Alberto Carlo, The Functional Art: An information graphics and visualization 1st 20	12				
	[6] Cole Nussbaumer Knaflic, Storvtelling	with Data	a: A Data			
	Visualization Guide for Business Professionals 1st, 2015					

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:

	SLO					
CLO	1	2	3	4	5	6
1	Х	Х				
2		Х	Х			
3		Х				

3. Planned learning activities and teaching methods

Week	Торіс	CLO	Assessments	Learning activities	Resources
1	Visualization design principles	1	Quiz	Teaching, presentation	
2	Perception, Cognition, Color	1,2	Quiz, Project	Teaching, presentation	
3	Data abstraction, data types	2,3	Quiz, Project	Teaching, presentation	
4	Visual encoding with marks and channels	2,3	Quiz, Project	Teaching, presentation	
5	Tasks and Interactivity	2,3	Quiz, Project	Teaching, presentation	
6	Midterm				
7	Validation and visualization	1,3	Quiz, in-class exercises, Project	Teaching, Discussion	
8	Arrange text and sets	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
9	Arrange spatial data	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
10	Arrange tree and graphs/networks	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
11	Facets and views	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
12	Focus+Context	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
13	Filtering and Aggregation	2,3	Quiz, in-class exercises, Project	Teaching, Discussion	
14	Final exam				

4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)		x	x
Midterm examination (30%)	х	x	
Final examination (40%)		x	x
Exercises/ Quiz (10%)	X	X	

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

- 2. 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.
- 5. Rubrics (optional)

5.4. Grading checklist

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

5.5. Holistic rubric

Holi	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.

5.6. Analytic rubric

Critical thinking value rubric for evaluating questions in exams:

	Capstone	Milestone		Benchmark
	4	3	2	1
			Issue/ problem to be	
	Issue/ problem		considered critically is stated but description	
	critically is stated clearly and described	Issue/ problem to be considered critically is	leaves some terms undefined,	Issue/
	comprehensivel y, delivering all relevant information	stated, described, and clarified so that understanding is	ambiguities unexplored, boundaries undetermined	problem to be considered critically is stated without
Explanation of issues	full full understanding.	impeded by omissions.	, and/ or backgrounds unknown.	or description.
	Information is taken from source(s) with	Information is taken from source(s) with	Information is taken from source(s) with some	
	enough interpretation/ evaluation to develop a	enough interpretation/ evaluation to develop a	interpretation / evaluation, but not enough to	Information is taken from source(s) without any
Evidence	comprehensive	coherent	develop a	interpretation/
Selecting and using	analysis or synthesis.	analysis or synthesis.	coherent analysis or	evaluation. Viewpoints of
<i>information to</i> <i>investigate a</i> <i>point of view or</i>	Viewpoints of experts are questioned	Viewpoints of experts are subject to	synthesis. Viewpoints of experts are	experts are taken as fact, without
conclusion	thoroughly.	questioning.	taken as	question.

			mostly fact, with little	
			questioning.	
			Questions	
			assumptions.	Shows an
			Identifies	emerging
	Thoroughly		several	awareness of
	(systematically		relevant	present
	methodically)		when	(sometimes
	analyzes own		presenting a	labels
	and others'		position.	assertions as
	assumptions and	Identifies own	May be more	assumptions).
	evaluates the	and others and assumptions and	aware of others'	identify some
	relevance of	several relevant	assumptions	contexts
Influence of	contexts when	contexts when	than one's	when
context and	presenting a	presenting a	own (or vice	presenting a
assumptions	position.	position.	versa).	position.
	Specific			
	(nerspective.			
	thesis/			
	hypothesis) is			
	imaginative,			
	taking into			
	complexities of	Specific position		
	an issue. Limits	(perspective,		
	of position	thesis/hypothesi		
	(perspective,	s) takes into		
	hvpothesis) are	complexities of	Specific	
	acknowledged.	an issue. Others'	position	Specific
	Others' points of	points of view	(perspective,	position
	view are	are	thesis/	(perspective,
Student's	synthesized	acknowledged	hypothesis)	thesis/
posicion (nersnective	(nerspective	(nerspective	s different	stated but is
thesis/hypothesi	thesis/	thesis/	sides of an	simplistic and
s)	hypothesis).	hypothesis).	issue.	obvious.

			Conclusion is	
	Conclusions and		logically tied	
	related	Conclusion is	to	Conclusion is
	outcomes	logically tied to	information	inconsistently
	(consequences	a range of	(because	tied to some
	and	information.	information	of the
	implications)	including	is chosen to	information
	are logical and	opposing	fit the desired	discussed:
	reflect student's	viewpoints:	conclusion):	related
	informed	related	some related	outcomes
Conclusions and	evaluation and	outcomes	outcomes	(consequence
related	ability to place	(consequences	(consequence	s and
outcomes	evidence and	and	s and	implications)
(implications	perspectives	implications) are	implications)	are
and	discussed in	identified	are identified	oversimplifie
consequences)	priority order.	clearly.	clearly.	d.

	Capstone	Mile	stone	Benchmark
	4	3	2	1
	Organizationa			
	1 pattern			
	(specific			
	introduction	Organizationa		
	and	l pattern	Organizationa	
	conclusion,	(specific	1 pattern	
	sequenced	introduction	(specific	
	material	and	introduction	Organizational
	within the	conclusion,	and	pattern
	body, and	sequenced	conclusion,	(specific
	transitions) is	material	sequenced	introduction
	clearly and	within the	material	and conclusion,
	consistently	body, and	within the	sequenced
	observable	transitions) is	body, and	material within
	and is skillful	clearly and	transitions) is	the body, and
	and makes the	consistently	intermittently	transitions) is
	content of the	observable	observable	not observable
	presentation	within the	within the	within the
Organization	cohesive.	presentation.	presentation.	presentation.
	Language	Language	Language	Language
	choices are	choices are	choices are	choices are
	imaginative,	thoughtful	mundane and	unclear and
	memorable,	and generally	commonplace	minimally
	and	support the	and partially	support the
	compelling,	effectiveness	support the	effectiveness of
	and enhance	of the	effectiveness	the
Language	the	presentation.	of the	presentation.

Oral communication value rubric for evaluating presentation tasks:

	effectiveness of the presentation. Language in presentation is appropriate to audience.	Language in presentation is appropriate to audience.	presentation. Language in presentation is appropriate to audience.	Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressivenes s) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressivenes s) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressivenes s) make the presentation understandabl e, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandabili ty of the presentation, and speaker appears uncomfortable.
Supporting	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	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	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	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
Supporting Material	authority on the topic.	authority on the topic.	authority on the topic.	authority on the topic.

	Central			
	message is			
	compelling		Central	
	(precisely	Central	message is	
	stated,	message is	basically	Central
	appropriately	clear and	understandabl	message can be
	repeated,	consistent	e but is not	deduced but is
	memorable,	with the	often repeated	not explicitly
	and strongly	supporting	and is not	stated in the
Central Message	supported.)	material.	memorable.	presentation.

Date revised: February 15, 2022

Ho Chi Minh City, 15/02/2022 Dean of School of Computer Science and Engineering

Month

TT

Assoc.Prof. Nguyen Van Sinh