

**CHƯƠNG TRÌNH ĐÀO TẠO KHÓA 2023 – NGÀNH KHOA HỌC DỮ LIỆU  
TRÌNH ĐỘ ĐẠI HỌC**

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

**1. Thông tin chung**

- Tên ngành đào tạo:
  - + Tiếng Việt: **Khoa học Dữ liệu**
  - + Tiếng Anh: **Data Science**
- Mã ngành đào tạo: 7460108
- Trình độ đào tạo: Cử nhân
- Loại hình đào tạo: Tập trung
- Thời gian đào tạo: 4 năm (8 học kỳ)
- Tên văn bằng sau khi tốt nghiệp:
  - + Tiếng Việt: Cử nhân Khoa học dữ liệu
  - + Tiếng Anh: Bachelor of Science in Data Science
- Nơi đào tạo:

**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: A00 (Toán -Lý-Hoá), A01(Toán-Lý-Anh)

d. Dự kiến chỉ tiêu tuyển sinh, quy mô đào tạo: 50-100 sinh viên cho mỗi khoa

**3. Mục tiêu đào tạo**

a. Mục tiêu chung:

*Cách tuyên bố mục tiêu theo hướng dẫn tại Điều 4, Chương II, Thông tư 17/2021/TT-BGDĐT). Mô tả thật khái quát, nên là một đoạn thật ngắn, nhưng thể hiện được sự gắn kết với Tâm nhìn, sứ mạng của Trường và phù hợp với mục tiêu của giáo dục đại học quy định tại Luật giáo dục đại học (Theo Thông tư số*

04/2016/TT-BGDĐT ngày 14/3/2016, Quy định về tiêu chuẩn đánh giá chất lượng chương trình đào tạo các trình độ của giáo dục đại học).

Trong phần này, cần trình bày sự gắn kết của mục tiêu tương thích với Tâm nhìn, sứ mạng, mục tiêu giáo dục của Luật giáo dục cụ thể, có thể trình bày theo Bảng 1. Nếu Khoa/BM có xây dựng Tâm nhìn sứ mạng của Khoa, BM thì cần phải trình bày sự tương thích của mục tiêu và Tâm nhìn, sứ mạng của Khoa/BM, đồng thời cho thấy mối quan hệ của Tâm nhìn, sứ mạng của Khoa/BM và Tâm nhìn, sứ mạng của Trường.

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

Mục tiêu đào tạo của CTĐT	Tâm 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)
Ngành KHDL tại Khoa CNTT đào tạo ra các cử nhân đạt được: (i) nền tảng kiến thức cơ bản vững chắc về quản lý, xử lý và phân tích dữ liệu lớn, (ii) kiến thức chuyên ngành sâu và rộng về khoa học dữ liệu 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,	Khoa CNTT là một trong các khoa của Trường Đại học Quốc tế, ĐHQG-TP.HCM. Do đó, tầm nhìn của Khoa phụ thuộc và tầm nhìn của Trường (Trường ĐHQT là trường đại học nghiên cứu thuộc tốp đầu tại châu Á; là cơ sở giáo dục quốc tế, tự chủ, sáng tạo; là nơi vun đắp và phát triển nguồn nhân lực chất lượng cao cho thị trường lao động trong	Đào tạo chất lượng cao đa ngành – đa lĩnh vực cho bậc đại học và sau đại học. Tất cả các CTĐT được đánh giá theo tiêu chuẩn trong nước và quốc tế AUN.	Mục tiêu giáo dục nhằm phát triển toàn diện con người Việt Nam có đạo đức, tri thức, văn hóa, sức khỏe, thẩm mỹ và nghề nghiệp; có phẩm chất, năng lực và ý thức công dân; có lòng yêu nước, tinh thần dân tộc, trung thành với lý tưởng độc lập dân tộc và chủ nghĩa xã hội; phát huy tiềm năng, khả năng sáng tạo của mỗi cá nhân; nâng cao dân trí, phát triển nguồn nhân lực, bồi dưỡng nhân tài, đáp ứng yêu cầu

<p>(vi) khả năng tự học hoặc tham gia các khóa bồi dưỡng để nắm bắt các công nghệ mới, và</p> <p>(vii) đủ năng lực học tiếp sau đại học trong và ngoài nước.</p>	<p><b>nước và quốc tế.)</b></p>	<p>xuất sắc, truyền cảm hứng và hỗ trợ các thành viên của ĐHQG TP.HCM trong việc phát triển toàn diện</p>	<p>của sự nghiệp xây dựng, bảo vệ Tổ quốc và hội nhập quốc tế (Điều 2)</p>
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#### b. Mục tiêu cụ thể (Program Objectives - POs)

*Được xác định từ mục tiêu chung, và cụ thể thành các mục tiêu được phân theo các khía cạnh, kỹ năng, mức tự chủ và trách nhiệm. Vì từ các mục tiêu cụ thể trình bày ở đây sẽ xác định các chuẩn đầu ra (CDR) tương ứng. (Tham khảo Khung trình độ Quốc gia Việt Nam để xác định mục tiêu đầu đủ để từ đó có thể xác định CDR tương ứng theo các yêu cầu).*

*Lưu ý: Mục tiêu là điều mà CTĐT mong muốn người học đạt được, CDR sẽ là năng lực mà người học đạt được ngay khi tốt nghiệp.*

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

**(PO1)** Có kiến thức cơ bản và nâng cao về lĩnh vực Khoa học dữ liệu

**(PO2)** Có kỹ năng làm việc vững chắc và tư duy hệ thống để giải quyết các vấn đề thực tế

**(PO3)** Làm việc hiệu quả, có đạo đức và sáng tạo như một chuyên gia dữ liệu

**(PO4)** Có khả năng tiếp tục học hỏi suốt đời và phát triển chuyên môn

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

*Cách tuyên bố mục tiêu theo hướng dẫn tại Điều 5, Chương II, Thông tư 17/2021/TT-BGDĐT). Thầy/Cô trình bày CDR rõ ràng, đo được theo cấp độ tư duy và được sắp xếp theo các khía cạnh: kiến thức, kỹ năng, mức tự chủ và trách nhiệm theo Khung trình độ Quốc gia Việt Nam.*

Danh sách 6 CDR theo ABET được xem xét trong chương trình đào tạo gồm:

**(PLO1)** Phân tích một vấn đề tính toán phức tạp, và áp dụng các nguyên tắc tính toán và các nguyên tắc liên quan khác để xác định các giải pháp.

**(PLO2)** Thiết kế, thực hiện và đánh giá một giải pháp dựa trên tính toán để đáp ứng các yêu cầu tính toán nhất định trong bối cảnh của phạm vi chương trình.

**(PLO3)** Giao tiếp hiệu quả trong nhiều ngữ cảnh chuyên nghiệp.

**(PLO4)** Công nhận trách nhiệm nghề nghiệp và đưa ra các phán đoán thông tin trong thực tiễn máy tính dựa trên nguyên tắc pháp lý và đạo đức.

**(PLO5)** Chức năng có hiệu quả như một thành viên hoặc lãnh đạo của một nhóm tham gia vào các hoạt động phù hợp với phạm quy của chương trình.

**(PLO6)** Áp dụng lý thuyết khoa học dữ liệu và các nguyên tắc phát triển phần mềm để đưa ra các giải pháp dựa trên tính toán.

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

CĐR sẽ gắn kết với mục tiêu cụ thể đã được xác định ở Mục 3, theo Bảng 2.

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

<b>PLOs<sup>(1)</sup></b>	<b>POs<sup>(2)</sup></b>			
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>
PLO1	x			
PLO2		x		
PLO3			x	
PLO4			x	
PLO5			x	
PLO6				x

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

<sup>(2)</sup>Cột POs: Thầy/Cô cung cấp các mục tiêu đào tạo cụ thể mà đã được trình bày ở Mục 3

Trong Bảng 2, cần xác định mối liên quan bằng cách đặt dấu “X”

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

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

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

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

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

**Bảng 3: Thang điểm**

Xếp loại	Thang điểm 100	Thang điểm 10	Thang điểm 4	Thang điểm chữ
<b>Đạt</b>				
Xuất sắc	$90 \leq \text{ĐTBTL} \leq 100$	$9,0 \leq \text{ĐTBTL} \leq 10$	4,0	A <sup>+</sup>
Giỏi	$80 \leq \text{ĐTBTL} < 90$	$8,0 \leq \text{ĐTBTL} < 9,0$	3,5	A
Khá	$70 \leq \text{ĐTBTL} < 80$	$7,0 \leq \text{ĐTBTL} < 8,0$	3,0	B <sup>+</sup>
Trung bình khá	$60 \leq \text{ĐTBTL} < 70$	$6,0 \leq \text{ĐTBTL} < 7,0$	2,5	B
Trung bình	$50 \leq \text{ĐTBTL} < 60$	$5,0 \leq \text{ĐTBTL} < 6,0$	2,0	C
<b>Không đạt</b>				
Yếu	$40 \leq \text{ĐTBTL} < 50$	$4,0 \leq \text{ĐTBTL} < 5,0$	1,5	D <sup>+</sup>
Kém	$30 \leq \text{ĐTBTL} < 40$	$3,0 \leq \text{ĐTBTL} < 4,0$	1,0	D
	$\text{ĐTBTL} < 30$	$\text{ĐTBTL} < 3,0$	0,0	F

### 8. Khối lượng kiến thức toàn khoá

Tổng số tín chỉ: 129 tín chỉ, trong đó phân bổ kiến thức như Bảng 4 (không bao gồm giáo dục thể chất và giáo dục quốc phòng):

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

TT	Các khối kiến thức <sup>(3)</sup>	Khối lượng	
		Số tín chỉ	%
I	Khối kiến thức giáo dục đại cương	39	30,23
II	Khối kiến thức cơ sở ngành	27	20,93
III	Kiến thức chuyên ngành	32	24,81
IV	Kiến thức tự chọn	15	11,63
V	Thực tập, khóa luận/luận văn tốt nghiệp	16	12,4
	Tổng cộng	<b>129</b>	<b>100</b>

## 9. Nội dung chương trình đào tạo

**Bảng 5. Các môn học thuộc CTĐT**

ST T	Mã môn học	Tên môn học		Loại MH (bắt buộc /tự chọn )	Tín chỉ			Phòng thí nghiệm (TN)			
		Tiếng Việt	Tiếng Anh		Tổn g cộn g	Lý thuyé t	Thực hành/ Thí nghiệ m				
<b>1</b> <i>Kiến thức giáo dục đại cương</i>											
<b>1.1</b> <i>Các môn tư tưởng chính trị</i>											
1	PE015I U	Triết học Mác- Lênin	Philosophy Marx – Lenin	Bắt buộc	3	3	0				
2	PE016I U	Kinh tế chính trị Mác- Lênin	Marx-Lenin Political Economy	Bắt buộc	2	2	0				
3	PE018I U	Lịch sử Đảng cộng sản Việt Nam	History of Vietnamese Communist Party	Bắt buộc	2	2	0				
4	PE019I U	Tư tưởng Hồ Chí Minh	Ho Chi Minh's Thoughts	Bắt buộc	2	2	0				
5	PE017I U	Chủ nghĩa xã hội khoa học	Scientific Socialism	Bắt buộc	2	2	0				
	Tổng cộng				<b>11</b>	<b>11</b>	<b>0</b>				
<b>1.2</b>	<i>Khoa học tự nhiên và xã hội</i>										

6	PE021IU	Pháp luật đại cương	General law	Bắt buộc	3	3	0	
7	MA001IU	Toán 1	Calculus 1	Bắt buộc	4	4	0	
8	IT154IU	Đại số tuyến tính	Linear Algebra	Bắt buộc	3	3	0	
9	MA026IU	Xác suất và quá trình ngẫu nhiên	Probability Statistic and Random Process	Bắt buộc	3	3	0	
10	IT151IU	Phương pháp thống kê	Statistical Methods	Bắt buộc	3	3	0	
11	IT171IU	Thống kê nâng cao	Statistical Learning	Bắt buộc	4	3	1	Phòng TN.CNT T
	Tổng cộng				<b>20</b>	<b>20</b>	<b>0</b>	
<b>1.3</b>	<b>Ngoại ngữ</b>							
12	EN008IU	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)	Academic English 1 (listening skill)	Bắt buộc	2	2	0	
13	EN007IU	Tiếng Anh chuyên ngành 1 (kỹ năng viết)	Academic English 1 (writing skill)	Bắt buộc	2	2	0	
14	EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)	Academic English 2 (speaking skill)	Bắt buộc	2	2	0	

15	EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)	Academic English 2 (writing skill)	Bắt buộc	2	2	0	
	Tổng cộng				8	8	0	
1.4	<b>Giáo dục thể chất</b>							
16	PT001IU	Giáo dục thể chất 1	Physical Training 1	Bắt buộc	3	0	3	
17	PT002IU	Giáo dục thể chất 2	Physical Training 2	Bắt buộc	3	0	3	
	Tổng cộng				6	0	6	
1.6	<b>Giáo dục Quốc phòng</b>				0			
2	<b>Kiến thức giáo dục chuyên nghiệp</b>							
2.1	<b>Kiến thức cơ sở ngành</b>							
18	IT135IU	Nhập môn khoa học dữ liệu	Introduction to Data Science	Bắt buộc	3	3	0	
19	IT149IU	Lập trình cơ bản	Fundamentals of Programming	Bắt buộc	4	3	1	Phòng TN.CNT T
20	IT069IU	Lập trình hướng đối tượng	Object-Oriented Programming	Bắt buộc	4	3	1	Phòng TN.CNT T
21	IT013IU	Cấu trúc dữ liệu và giải thuật	Data Structures and Algorithms	Bắt buộc	4	3	1	Phòng TN.CNT T
22	IT079IU	Nguyên tắc của quản trị cơ sở dữ liệu	Principles of Database Management	Bắt buộc	4	3	1	Phòng TN.CNT T

23	IT159IU	Trí tuệ nhân tạo	Artificial Intelligence	Bắt buộc	4	3	1	Phòng TN.CNT T
24	IT140IU	Khái niệm cơ bản về bảo mật dữ liệu	Fundamental Concepts of Data Security	Bắt buộc	4	3	1	Phòng TN.CNT T
	Tổng cộng				27	21	6	
<b>2.2</b>	<b>Kiến thức chuyên ngành</b>							
25	IT136IU	Phân tích hồi qui	Regression Analysis	Bắt buộc	4	3	1	Phòng TN.CNT T
26	IT137IU	Phân tích dữ liệu	Data Analysis	Bắt buộc	4	3	1	Phòng TN.CNT T
27	IT138IU	Khoa học dữ liệu và trực quan hóa dữ liệu	Data Science and Data Visualization	Bắt buộc	4	3	1	Phòng TN.CNT T
28	IT139IU	Tính toán khả năng mở rộng và phân bố	Scalable and Distributed Computing	Bắt buộc	4	3	1	Phòng TN.CNT T
29	IT160IU	Khai thác dữ liệu	Data Mining	Bắt buộc	4	3	1	Phòng TN.CNT T
30	IT157IU	Học sâu	Deep Learning	Bắt buộc	4	3	1	Phòng TN.CNT T
31	IT172IU	Học máy	Machine learning	Bắt buộc	4	3	1	Phòng TN.CNT T

32	IT173IU	Phân tích dữ liệu lớn	Big Data Analytics	Bắt buộc	4	3	1	Phòng TN.CNT T
	Tổng cộng				32	24	8	
<b>3</b>	<b>Kiến thức tự chọn (sinh viên chọn tối thiểu 15 tín chỉ trong nhóm các môn học sau)</b>							
33	IT144IU	Phân Tích Quy Trình Nghiệp Vụ	Business Process Analysis	Tự chọn	4	3	1	Phòng TN.CNT T
34	IT145IU	Hệ Thống Hỗ Trợ Quyết Định	Decision Support Systems	Tự chọn	4	3	1	Phòng TN.CNT T
35	IT169IU	Phân tích chuỗi thời gian	Time Series Analysis	Tự chọn	4	3	1	Phòng TN.CNT T
36	IT146IU	Lý Thuyết Mạng Máy Tính	Theory of Networks	Tự chọn	4	3	1	Phòng TN.CNT T
37	IT056IU	Quản Trị Dự Án CNTT	IT Project Management	Tự chọn	4	3	1	Phòng TN.CNT T
38	IT094IU	Quản Lý Hệ Thống Thông Tin	Information System Management	Tự chọn	4	3	1	
39	IT164IU	Điện Toán Đám Mây	Cloud Computing	Tự chọn	4	3	1	Phòng TN.CNT T
40	IT150IU	Blockchain	Blockchain	Tự chọn	4	3	1	Phòng TN.CNT T
41	IT120IU	Khởi nghiệp	Entrepreneurs hip	Tự chọn	3	3	0	

42	IT163IU	Tối ưu hóa và ứng dụng	Optimization and Applications	Tự chọn	4	3	1	
43	IT076IU	Công nghệ phần mềm	Software Engineering	Tự chọn	4	3	1	Phòng TN.CNT T
44	IT153IU	Toán rời rạc	Discrete Mathematics	Tự chọn	3	3	0	
45	IT170IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	Tự chọn	4	3	1	Phòng TN.CNT T
46		Tự chọn tự do	Free elective	Tự chọn	4	3 or 4	1 or 0	
	Tổng cộng				15			
4	<b>Nghiên cứu, thực tập và luận văn tốt nghiệp</b>							
47	IT082IU	Thực tập	Internship	Bắt buộc	3	3	0	
48	IT083IU	Thực tập tốt nghiệp	Special Study of the Field	Bắt buộc	3	3	0	
<b>Sinh viên sẽ làm luận văn tốt nghiệp nếu GPA &gt;=70</b>								
49	IT058IU	Luận văn tốt nghiệp	Thesis	Bắt buộc	10	10	0	
<b>Sinh viên có GPA&lt;70: chọn môn Đồ án tốt nghiệp 2 và 2 môn tự chọn (sinh viên chọn 2 môn tự chọn có ít nhất 7 tín chỉ)</b>								
50	IT168IU	Thực tập tốt nghiệp 2	Special Study of the Field 2	Bắt buộc	3	3	0	
51	IT144IU	Phân Tích Quy Trình Nghiệp Vụ	Business Process Analysis	Tự chọn	4	3	1	Phòng TN.CNT T

52	IT145IU	Hệ Thống Hỗ Trợ Quyết Định	Decision Support Systems	Tự chọn	4	3	1	Phòng TN.CNT T
53	IT169IU	Phân tích chuỗi thời gian	Time Series Analysis	Tự chọn	4	3	1	Phòng TN.CNT T
54	IT146IU	Lý Thuyết Mạng Máy Tính	Theory of Networks	Tự chọn	4	3	1	Phòng TN.CNT T
55	IT056IU	Quản Trị Dự Án CNTT	IT Project Management	Tự chọn	4	3	1	Phòng TN.CNT T
56	IT094IU	Quản Lý Hệ Thống Thông Tin	Information System Management	Tự chọn	4	3	0	
57	IT164IU	Điện Toán Đám Mây	Cloud Computing	Tự chọn	4	3	1	Phòng TN.CNT T
58	IT150IU	Blockcha in	Blockchain	Tự chọn	4	3	1	Phòng TN.CNT T
59	IT120IU	Khởi nghiệp	Entrepreneurs hip	Tự chọn	3	3	0	
60	IT163IU	Tối ưu hóa và ứng dụng	Optimization and Applications	Tự chọn	4	3	1	
61	IT076IU	Công nghệ phần mềm	Software Engineering	Tự chọn	4	3	1	Phòng TN.CNT T
62	IT153IU	Toán rời rạc	Discrete Mathematics	Tự chọn	3	3	0	
63	IT170IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	Tự chọn	4	3	1	Phòng TN.CNT T

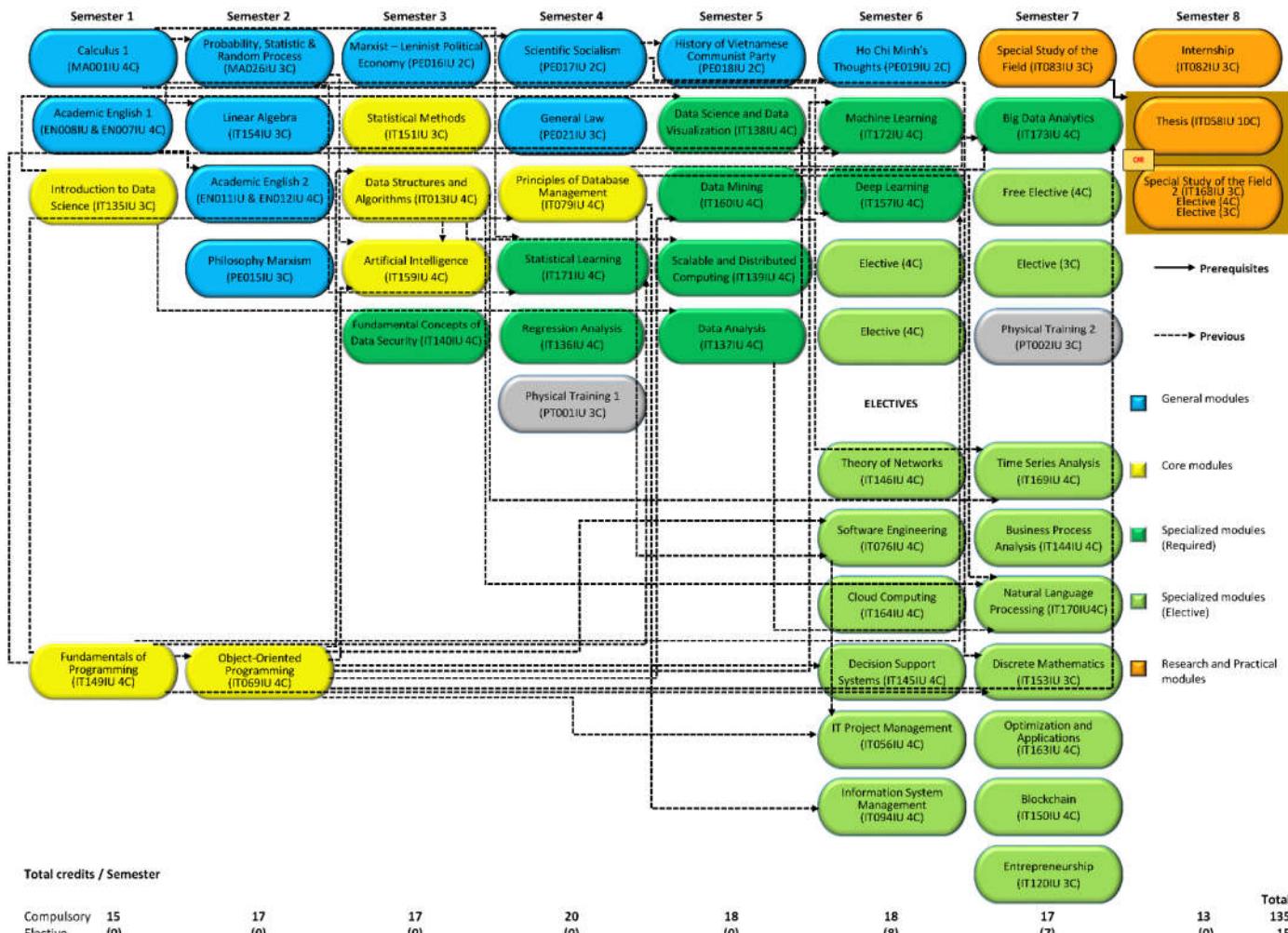
	Tổng cộng				<b>16</b>	<b>16</b>	<b>0</b>	
	<b>Tổng số (tín chỉ)</b>				<b>129</b>			

**Ghi chú:**

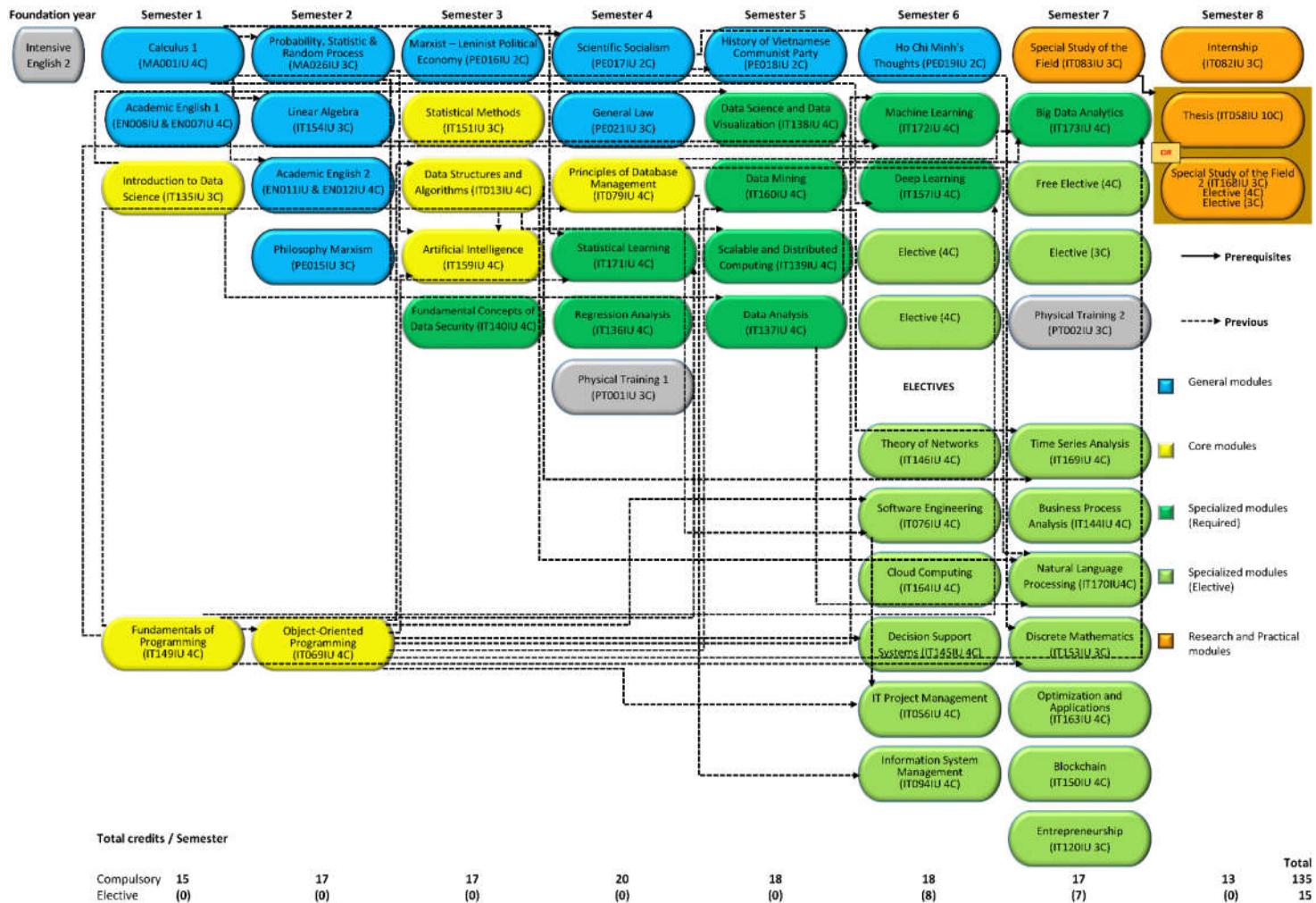
- (\*\*): Ghi tên PTN. Nếu sử dụng chung PTN do CSĐT khác quản lý phải ghi rõ tên CSĐT và đính kèm thỏa thuận cho phép sử dụng PTN.
- Số thứ tự của các môn học được đánh số tăng dần.

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

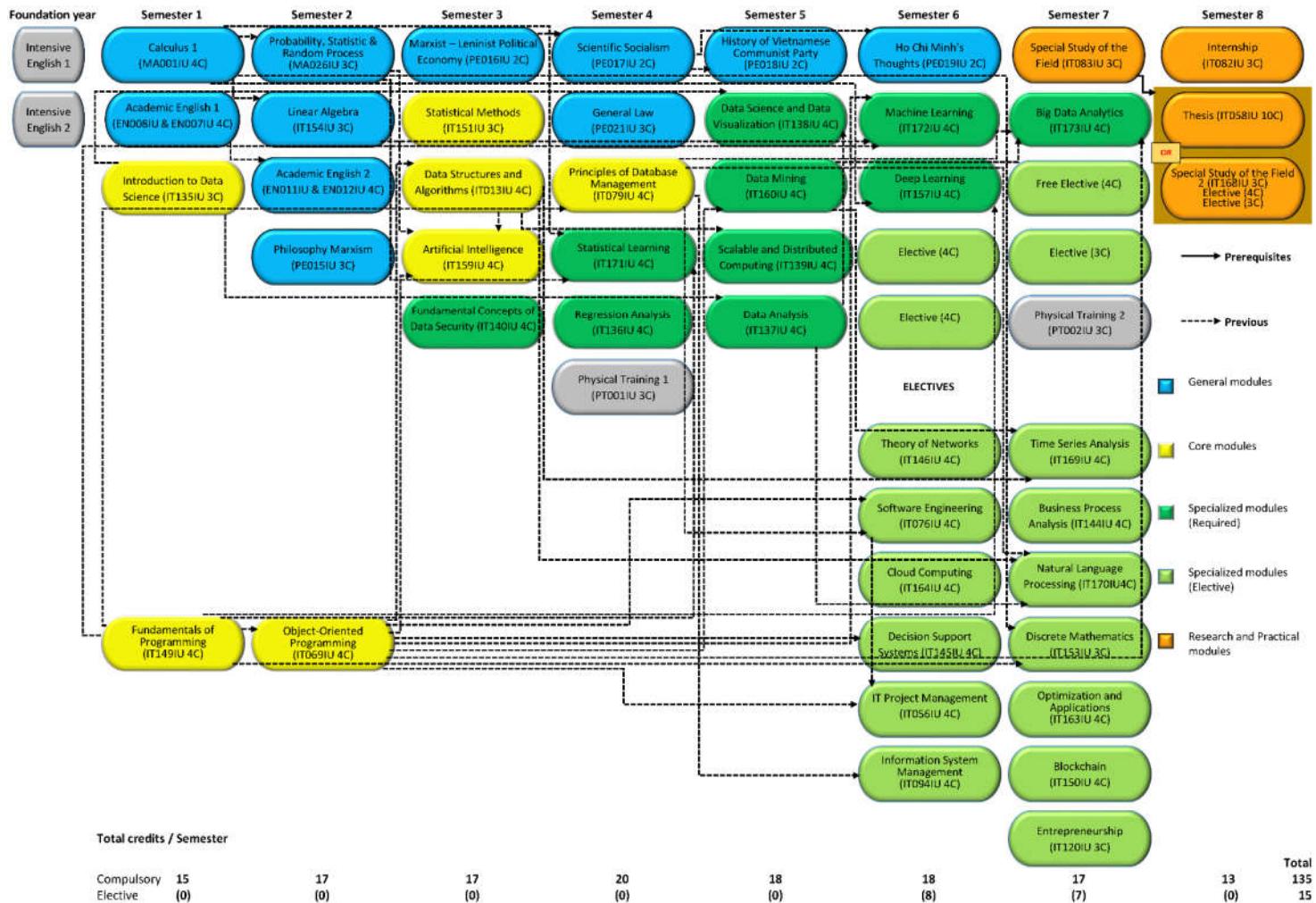
## 10.1 Trình độ AE1:



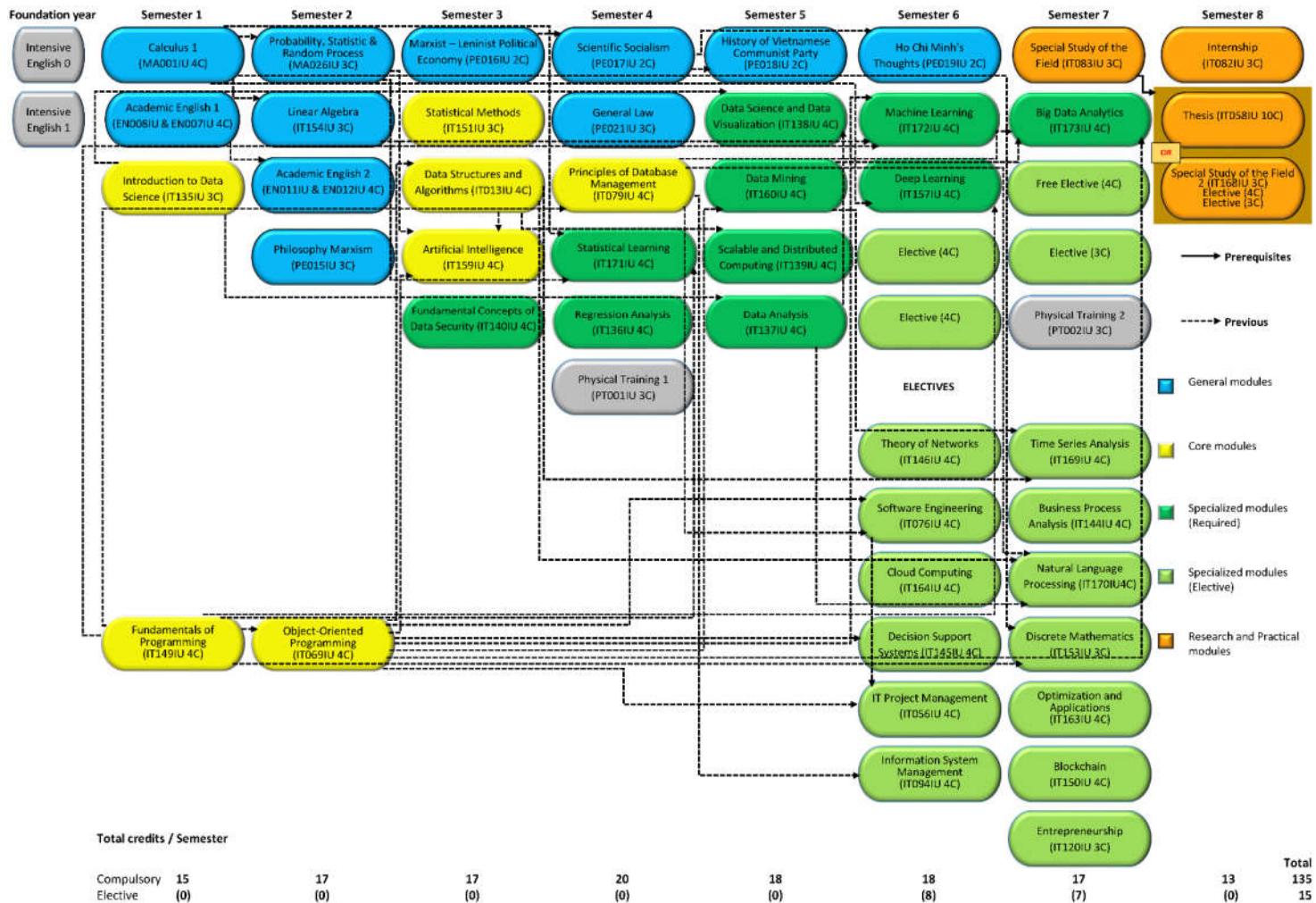
## 10.2 Trình độ IE2:



### 10.3 Trình độ IE1:



## 10.4 Trình độ IE0:



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

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

Mức độ đóng góp của các môn học vào chuẩn đầu ra của CTĐT ngành Khoa học dữ liệu được trình bày như Bảng 6.

**Bảng 6. Đóng góp của các môn học vào CDR của CTĐT**

<b>Mã môn học</b>	<b>Tên môn học</b>	<b>Chuẩn đầu ra (ABET)</b>					
		PLO1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
	<b>Kiến thức giáo dục đại cương</b>						
	<i>Các môn lý luận chính trị</i>						
PE015IU	Triết học Mác-Lênin				xx		
PE016IU	Kinh tế chính trị Mác-Lênin				xx		
PE018IU	Lịch sử Đảng cộng sản Việt Nam				x		
PE019IU	Tư tưởng Hồ Chí Minh				xx		
PE017IU	Chủ nghĩa xã hội khoa học				xx		
	<b>Khoa học tự nhiên và xã hội</b>						
PE021IU	Pháp luật đại cương				xx	x	
MA001IU	Toán 1	xx		x			
IT154IU	Đại số tuyến tính	xx		x			
MA026IU	Xác suất và quá trình ngẫu nhiên	xx					
IT151IU	Phương pháp thống kê	xx	x				
	<b>Ngoại ngữ</b>						
EN008IU	Tiếng Anh chuyên ngành 1 (kỹ năng nghe)			xxx			
EN007IU	Tiếng Anh chuyên ngành 1 (kỹ năng viết)			xxx			
EN012IU	Tiếng Anh chuyên ngành 2 (kỹ năng nói)			xxx			
EN011IU	Tiếng Anh chuyên ngành 2 (kỹ năng viết)			xxx			

<b>Giáo dục thể chất</b>						
PT001IU	Giáo dục thể chất 1				x	
PT002IU	Giáo dục thể chất 2				x	
<b>Giáo dục Quốc phòng</b>						
<b>Kiến thức giáo dục chuyên nghiệp</b>						
<b>Kiến thức cơ sở của ngành</b>						
IT135IU	Nhập môn khoa học dữ liệu	xx		x		x
IT149IU	Lập trình cơ bản	x	xx			
IT069IU	Lập trình hướng đối tượng	xx	xxx			x
IT013IU	Cấu trúc dữ liệu và giải thuật	xx	xxx			x
IT079IU	Nguyên tắc của quản trị cơ sở dữ liệu	xx	xxx			x
IT159IU	Trí tuệ nhân tạo	xx	xxx			x
IT136IU	Phân tích hồi qui	xxx	xx			
IT140IU	Khái niệm cơ bản về bảo mật dữ liệu		xx	x		x
<b>Kiến thức chuyên ngành</b>						
<b>Kiến thức bắt buộc</b>						
IT171IU	Thống kê nâng cao	xxx	x			
IT138IU	Khoa học dữ liệu và trực quan hóa dữ liệu	xx	x	xx		
IT139IU	Tính toán khả năng mở rộng và phân bố	xx	xxx			x
IT137IU	Phân tích dữ liệu	xxx	xx			
IT160IU	Khai thác dữ liệu	xxx			x	xx
IT157IU	Học sâu	xx	xx			x
IT172IU	Học máy	xx	xx			x
IT173IU	Phân tích dữ liệu lớn	xx	xxx			x
<b>Kiến thức ngành tự chọn</b>						
IT144IU	Phân Tích Quy Trình Nghiệp Vụ	xx	xx	x		
IT145IU	Hệ Thống Hỗ Trợ Quyết Định	xx	xx	x		
IT169IU	Phân tích chuỗi thời gian	xx	xxx			x
IT146IU	Lý Thuyết Mạng Máy Tính	x			x	x
IT056IU	Quản Trị Dự Án CNTT	x		x	xx	
IT094IU	Quản Lý Hệ Thông Tin	x			xx	x

IT164IU	Điện Toán Đám Mây	X	XX	X			
IT150IU	Blockchain	XX	XX				X
IT120IU	Khởi nghiệp	X			X		
IT163IU	Tối ưu hoá và Ứng dụng	XX	XX				X
IT076IU	Công nghệ phần mềm	XX	XXX				X
IT153IU	Toán rời rạc	X	X				
IT170IU	Xử lý ngôn ngữ tự nhiên	X	XX	X			
IT076IU	Công nghệ phần mềm	X	XX	X			
	Tự chọn tự do						
<b>Nghiên cứu, thực tập và luận văn tốt nghiệp</b>							
IT082IU	Thực tập				X		X
IT083IU	Thực tập tốt nghiệp	XXX	XX				X
IT058IU	Luận văn tốt nghiệp	XXX	XXX				X
Sinh viên không được làm luận văn thì sẽ hoàn thành ba môn sau							
IT168IU	Thực tập tốt nghiệp 2	XXX	XXX				X
	Tự chọn 1	XX	XX				X
	Tự chọn 2	XX	XX				X

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

### 1. Triết học Mác-Lênin (Philosophy Marxist-Lenin)

**Mã MH:** PE015IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Môn học trang bị cho sinh viên những kiến thức cơ bản về triết học Mác-Lênin

### 2. Kinh tế chính trị Mác-Lênin (Marxist-Lenin Political Economy)

**Mã MH:** PE016IU

**Số tín chỉ:** 2 (2,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** 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.

### **3. Lịch sử Đảng Cộng sản Việt Nam (History of Vietnamese Communist Party)**

**Mã MH:** PE018IU

**Số tín chỉ:** 2 (2,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Môn học trang bị cho sinh viên những kiến thức cơ bản về lịch sử Đảng Cộng Sản Việt Nam.

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

**Mã MH:** PE019IU

**Số tín chỉ:** 2 (2,0)

**Môn học trước:** Nguyên lý cơ bản của chủ nghĩa Mác - Lênin.

**Mô tả văn tắt nội dung:** 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.

### **5. Chủ nghĩa xã hội khoa học (Scientific Socialism)**

**Mã MH:** PE017IU

**Số tín chỉ:** 2 (2,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Môn học trang bị cho sinh viên những kiến thức cơ bản về chủ nghĩa xã hội khoa học.

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

**Mã MH:** PE021IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Khóa 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, học sinh sẽ nâng cao nhận thức về trách nhiệm của mình trong việc đảm bảo công lý, bao gồm cả việc chấm dứt tham nhũng trong xã hội.

### **7. Toán 1 (Calculus 1)**

**Mã MH:** MA001IU

**Số tín chỉ:** 4 (4,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Nội dung chính: Hàm số, Giới hạn, Tính liên tục, Đạo hàm, Đạo hàm cho các hàm cơ bản, Quy 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.

## 8. Đại số tuyến tính (Linear Algebra)

**Mã MH:** IT154IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Toán 1, Lập trình cơ bản

**Mô tả văn tắt nội dung:** 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.

## 9. Xác suất thống kê và quá trình ngẫu nhiên (Probability Statistic and Random Process)

**Mã MH:** MA026IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Học sinh sẽ được cung cấp các kỹ năng sử dụng dữ liệu từ nhiều nguồn khác nhau, được làm quen với môi trường cơ sở dữ liệu và điện toán hiện đại, chẳng hạn như R/Python và được tiếp xúc với các nghiên cứu điển hình từ bên ngoài lớp học. Thông qua học phần này, sinh viên sẽ làm quen với những thách thức của khoa học dữ liệu đương đại và hiểu rõ hơn về các kỹ năng nền tảng cần thiết để biến dữ liệu thành thông tin.

## 10. Phương pháp thống kê (Statistical Methods)

**Mã MH:** IT151IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Toán 1, Lập trình cơ bản

**Mô tả văn tắt nội dung:** Cung cấp cho sinh viên nền tảng về các phương pháp thống kê giúp phân tích dữ liệu, bao gồm tóm tắt và mô tả dữ liệu và kỹ thuật suy luận. Chủ đề bao gồm phân phối xác suất cơ bản (ví dụ như phân phối chuẩn, và phân phối nhị thức), giá trị kỳ vọng, ước lượng (hợp lý cực đại, khoáng tin cậy), kiểm tra giả thuyết và phân tích hồi quy bội.

## **11. Thống kê nâng cao (Statistical Learning)**

**Mã MH:** IT171IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Toán 1, Xác suất thống kê và quá trình ngẫu nhiên, Lập trình cơ bản

**Mô tả văn tắt nội dung:** Đây là khóa học cấp đại học nâng cao giới thiệu phương pháp Bayesian về suy luận thống kê để phân tích dữ liệu trong nhiều ứng dụng, đặc biệt là trong Khoa học dữ liệu. Khóa học này cung cấp kiến thức về lý thuyết suy luận Bayes và phân tích dữ liệu bằng phần mềm thống kê (chủ yếu bằng Python) cũng sẽ được nhấn mạnh. Các chủ đề bao gồm: so sánh phương pháp Bayesian và phương pháp thường xuyên, đặc tả mô hình Bayes, đặc tả trước, cơ bản về lý thuyết quyết định, chuỗi Markov Monte Carlo, hệ số Bayes, Bayes thực nghiệm, hồi quy tuyến tính Bayes và mô hình tuyến tính tổng quát, mô hình phân cấp

## **12. Tiếng Anh chuyên ngành 1 - Kỹ năng Viết (Academic English 1 - Writing skill)**

**Mã MH:** EN007IU

**Số tín chỉ:** 2(2,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** 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 đoạn, dung từ và cụm từ nói 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

## **13. Tiếng Anh chuyên ngành 1- Kỹ năng Nghe (Academic English 1 - Listening skill)**

**Mã MH:** EN008IU

**Số tín chỉ:** 2(2,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Những kỹ năng nghe tiếng Anh học thuật, ghi chú, và thảo luận sẽ giúp sinh viên làm quen với những khó khăn trong việc học tiếng Anh ở đại học. Sinh viên sẽ học các kỹ năng cần thiết cho sinh viên đại học quốc tế, bao gồm: nghe bài giảng chủ động, ghi chú hiệu quả, tham gia thảo luận tự tin. Cùng với các kỹ năng nghe, sinh viên cũng sẽ trau dồi thêm vốn từ vựng học thuật.

## **14. Tiếng Anh chuyên ngành 2 - Kỹ năng Nói (Academic English 2 - Speaking skill)**

**Mã MH:** EN012IU

**Số tín chỉ:** 2 (2,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Môn học cung cấp cho sinh viên các chiến lược thiết thực sử dụng trong việc thuyết trình. Ngoài ra sinh viên được giúp đỡ hình thành kỹ năng lắng nghe, nhận xét và nêu ý kiến phản hồi đối với các bài thuyết trình khác trong lớp.

## **15. Tiếng Anh chuyên ngành 2 - Kỹ năng Viết (Academic English 2 - Writing skill)**

**Mã MH:** EN011IU

**Số tín chỉ:** 2 (2,0)

**Môn học trước:** Tiếng anh chuyên ngành 1 (Kỹ năng Viết)

**Mô tả vắn tắt nội dung:** 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.

## **16. Khoa học dữ liệu (Introduction to Data Science)**

**Mã MH:** IT135IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Không

**Mô tả vắn tắt nội dung:** Khóa học nhằm giới thiệu chung về bốn khía cạnh chính của khoa học dữ liệu: truy xuất và mô phỏng dữ liệu, trực quan dữ liệu, tính toán thống kê và học máy, và trình bày và giao tiếp. Học sinh sẽ sử dụng dữ liệu từ nhiều nguồn, được giới thiệu về các môi trường máy tính và cơ sở dữ liệu hiện đại như R/Python và SQL, và được tiếp xúc với các nghiên cứu bên ngoài lớp học. Thông qua khóa học này, sinh viên này sẽ làm quen với những thách thức của khoa học dữ liệu đương đại và đạt được các kỹ năng cơ bản cần thiết để chuyển dữ liệu thành thông tin.

## **17. Lập trình cơ bản (Fundamentals of Programming)**

**Mã MH:** IT149IU

**Số tín chỉ:** 3 (3,1)

**Môn học trước:** không

**Mô tả vắn tắt nội dung:** Khóa học này bao gồm sự phát triển thuật toán và các nguyên tắc lập trình máy tính sử dụng các ngôn ngữ phổ biến trong phân tích dữ liệu, như là C/C++ hay R/Python. Các chủ đề bao gồm giới thiệu về máy tính và tính toán, phát triển chương trình, cú pháp ngôn ngữ lập trình, và các phương pháp số nguyên tố cho các nhà khoa học dữ liệu. Môi trường lập trình và các tiện ích cũng được giới thiệu.

## **18. Lập trình hướng đối tượng (Object-Oriented Programming)**

**Mã MH:** IT069IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình cơ bản

**Mô tả vắn tắt nội dung:** Khái niệm cơ bản về lập trình và cấu trúc dữ liệu trong Java. Các kiểu dữ liệu cơ bản: các vòng lặp, các mảng, đệ quy và các con trỏ. Thiết kế hướng đối tượng: các lớp,

kết thừa, hàm chèn, và đa hình; Các kiểu dữ liệu trừu tượng: danh sách, danh sách liên kết, ngăn xếp và hàng đợi; Giới thiệu về phân tích thuật toán: ký hiệu O, tìm kiếm và sắp xếp.

## **19. Cấu trúc dữ liệu và giải thuật (Algorithms and Data Structures)**

**Mã MH:** IT013IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng

**Mô tả văn tắt nội dung:** Điều tra các tính chất thiết yếu của cấu trúc dữ liệu và các thuật toán để vận hành chúng; sử dụng các cấu trúc này làm công cụ hỗ trợ thiết kế thuật toán; để mở rộng cho các kỹ thuật tìm kiếm, phân loại và băm.

## **20. Nguyên tắc của quản trị cơ sở dữ liệu (Principles of Database Management)**

**Mã MH:** IT079IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình cơ bản

**Mô tả văn tắt nội dung:** Môn này giới thiệu cho sinh viên các khái niệm cơ bản về thiết kế cơ sở dữ liệu và hiện thực. Sinh viên sẽ học các kỹ thuật thiết kế cơ sở dữ liệu, bao gồm thiết kế quan hệ và phân tích quan hệ - thực thể (E-R). Các truy vấn cơ sở dữ liệu bằng cách sử dụng SQL được trình bày trong các bài giảng và được hỗ trợ bởi các bài tập thực hành.

## **21. Trí tuệ nhân tạo (Artificial Intelligence)**

**Mã MH:** IT159IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng, Cấu trúc dữ liệu và giải thuật, Xác suất thống kê và quá trình ngẫu nhiên

**Mô tả văn tắt nội dung:** Khóa học này giới thiệu các khái niệm cơ bản về trí tuệ nhân tạo (AI). Các chủ đề bao gồm: lịch sử AI, các tác nhân, tìm kiếm (không gian tìm kiếm, tìm kiếm không thông tin và thông tin, thỏa mãn ràng buộc, chơi trò chơi), mô tả tri thức (mã hóa logic về tri thức miền, các hệ thống lập luận logic), lập kế hoạch, và ngôn ngữ Lisp. Khóa học phù hợp với những sinh viên muốn đạt được một nền tảng kỹ thuật vững chắc và chuẩn bị cho công việc tiên tiến hơn trong AI.

## **22. Khái niệm cơ bản về bảo mật dữ liệu (Fundamental Concepts of Data Security)**

**Mã MH:** IT140IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Khóa học này giới thiệu cho sinh viên về các nguyên tắc và hệ thống mật mã (đối xứng và mã khóa công khai), và các ứng dụng của chúng trong bảo mật dữ liệu, truyền thông an toàn, chứng thực và ủy quyền. Những nguyên tắc cốt lõi này sẽ được áp dụng cho các khái niệm quản lý rủi ro thông tin, phân tích và xử lý các hệ thống bị xâm nhập. Các đạo

đức về tội phạm máy tính, quyền riêng tư và sở hữu trí tuệ được đề cập chi tiết. Cuối cùng, khóa học sẽ bao gồm các tiêu chí và các điều khiển để phân loại thông tin.

### **23. Phân tích hồi quy (Regression Analysis)**

**Mã MH:** IT136IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Phân tích hồi quy là một trong những phương pháp mạnh mẽ nhất trong thống kê để xác định mối quan hệ giữa các biến và sử dụng các mối quan hệ này để dự báo các quan sát trong tương lai. Nền tảng của phân tích hồi qui rất hữu ích cho các bài toán mô hình. Các mô hình hồi quy được sử dụng để dự đoán và dự báo kết quả trong tương lai. Sự phổ biến của nó trong tài chính rất cao; nó cũng rất phổ biến trong các lĩnh vực khác như khoa học sinh học, quản lý, và kỹ thuật.

### **24. Phân tích dữ liệu (Data Analysis)**

**Mã MH:** IT137IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Khoa học dữ liệu

**Mô tả văn tắt nội dung:** Khóa học này giới thiệu các nguyên tắc cơ bản của phân tích dữ liệu thông qua các quá trình phân tích dữ liệu cùng với thống kê mô tả và thống kê suy diễn. Sinh viên sẽ học cách thu thập dữ liệu, xử lý và biến chúng thành thông tin hữu ích và tri thức có ý nghĩa quan trọng trong việc ra quyết định. Từ dữ liệu thô đến thông tin hữu ích rồi đến tri thức, sinh viên sẽ kiểm tra một số số liệu và nghiên cứu tình huống từ các góc nhìn khác nhau. Sinh viên có thể phát triển các giải pháp thực tế cho các vấn đề trong kinh doanh và kỹ thuật, và đạt được kinh nghiệm thực tế từ việc sử dụng các công cụ phân tích dữ liệu hiện đại.

### **25. Khoa học dữ liệu và trực quan hóa dữ liệu (Data Science and Data Visualization)**

**Mã MH:** IT138IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Khoa học dữ liệu, Phân tích dữ liệu

**Mô tả văn tắt nội dung:** Mục tiêu của khóa học này là giới thiệu cho sinh viên các nguyên tắc, phương pháp và kỹ thuật then chốt để phân tích trực quan dữ liệu hiệu quả. Khóa học bắt đầu với mục đích và các nguyên tắc chính của trực quan hóa dữ liệu. Khóa học tiếp tục với các khía cạnh khác nhau của việc trực quan hóa bao gồm kỹ thuật và phương pháp mô tả các loại dữ liệu khác nhau, để thảo luận và phân tích trực quan hóa. Toàn bộ khóa học, sinh viên sẽ được giới thiệu với nhiều hệ thống trực quan hóa và công cụ trực quan thông qua các bài tập thực hành.

### **26. Tính toán khả năng mở rộng và phân bố (Scalable and Distributed Computing)**

**Mã MH:** IT139IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Cấu trúc dữ liệu và giải thuật

**Mô tả văn tắt nội dung:** Khóa học này trình bày lý thuyết, thiết kế, hiện thực, và phân tích các hệ thống phân bố. Thông qua các bài giảng lớp học, phòng thí nghiệm, dự án và bài tập, sinh viên có thể học các nguyên tắc cơ bản của hệ thống phân bố, mô hình hệ thống, gọi thủ tục từ xa, các đối tượng phân bố, hỗ trợ hệ điều hành, bảo mật trong các hệ thống phân bố, các hệ thống tập tin phân bố, đồng thời, giao dịch và đồng bộ hóa, sao chép. Khóa học cũng bao gồm các chủ đề nâng cao liên quan đến công nghệ xử lý dữ liệu phân bố và đám mây: phân vùng dữ liệu, sơ đồ lưu trữ, xử lý luồng, và các thuật toán song song. Các giờ thực hành của khóa học cho phép khai thác Internet và các dịch vụ điện toán đám mây hiện đại chạy trên nhiều trung tâm dữ liệu được phân bố theo địa lý: Google, Yahoo, Facebook, iTunes, Amazon, eBay, Bing, v.v ...

## 27. Khai thác dữ liệu (Data Mining)

**Mã MH:** IT160IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng

**Mô tả văn tắt nội dung:** Môn học này giới thiệu cho sinh viên các nguyên tắc và thuật toán khai thác dữ liệu, và các yêu cầu của quá trình khai thác dữ liệu. Sinh viên sẽ nghiên cứu các khái niệm khai thác dữ liệu và các thuật toán để giải quyết các vấn đề về khám phá tri thức. Sinh viên có thể phát triển kỹ năng sử dụng phần mềm khai thác dữ liệu gần đây để giải quyết các vấn đề thực tiễn, và có được kinh nghiệm làm việc nghiên cứu và nghiên cứu độc lập.

## 28. Học sâu (Deep Learning)

**Mã MH:** IT157IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình cơ bản, Toán 1

**Mô tả văn tắt nội dung:** Môn học này giúp sinh viên hiểu được khả năng, thách thức và hậu quả của việc học sâu và chuẩn bị cho sinh viên tham gia vào sự phát triển của công nghệ AI hàng đầu. Trong khóa học này, sinh viên sẽ xây dựng và đào tạo các kiến trúc mạng thần kinh như Mạng thần kinh phúc tạp, Mạng thần kinh tái phát, Máy biến áp và học cách làm cho chúng tốt hơn với các chiến lược như Dropout, BatchNorm, v.v. Sinh viên sẵn sàng để nắm vững các khái niệm lý thuyết và các ứng dụng công nghiệp bằng Python và PyTorch và giải quyết các trường hợp thực tế.

## 29. Học máy (Machine Learning)

**Mã MH:** IT172IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng, Lập trình cơ bản, Đại số tuyến tính

**Mô tả văn tắt nội dung:** Mục tiêu của môn học này nhằm trang bị cho sinh viên các kiến thức nền tảng cũng như các kỹ năng thực tế trong việc phát triển giải pháp cho dữ liệu lớn thông qua

việc sử dụng các công cụ quản lý dữ liệu lớn, đặc biệt là các hệ sinh thái của Hadoop. Môn học cũng tập trung vào các mô hình lập trình như MapReduce, Hive, Pig, and Apache Spark.

### **30. Phân tích dữ liệu lớn (Big Data Analytics)**

**Mã MH:** IT173IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng, Khai thác dữ liệu, Nguyên tắc của quản trị cơ sở dữ liệu

**Mô tả văn tắt nội dung:** Môn học này cung cấp kiến thức tổng quát về công nghệ được sử dụng trong các giải pháp Dữ liệu lớn (Big Data). Nó bao gồm việc phát triển các giải pháp Big Data sử dụng hệ thống Hadoop, bao gồm MapReduce, HDFS, khung lập trình Apache Pig và Hive. Khóa học này giúp sinh viên xây dựng một nền tảng để làm việc với các giải pháp dữ liệu lớn của Apache.

### **31. Phân Tích Quy Trình Nghiệp Vụ (Business Process Analysis)**

**Mã MH:** IT144IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Mô tả chức năng phát triển mạnh mẽ việc thực hiện các quy trình kinh doanh hiệu quả để tăng nhân viên và sự hài lòng của khách hàng, tăng cường hiệu suất kinh doanh, giảm chi phí và tăng năng suất. Tất cả các hoạt động bao gồm thay đổi các quy trình quan trọng, sáp nhập hoặc chia tách đơn vị kinh doanh yêu cầu một khung quản lý thống nhất về những thay đổi. Khóa học nhằm cung cấp kiến thức cơ bản về phân tích quá trình kinh doanh, cải tiến và đánh giá. Nhiều phương pháp, kỹ thuật và công cụ phần mềm được sử dụng để phân tích và quản lý cải tiến quá trình kinh doanh cũng được giới thiệu trong khóa học.

### **32. Hệ Thống Hỗ Trợ Quyết Định (Decision Support Systems)**

**Mã MH:** IT145IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng

**Mô tả văn tắt nội dung:** Hệ thống Hỗ trợ Quyết định (DSS) là một hệ thống dựa trên máy tính tương tác hoặc hệ thống con nhằm giúp các nhà hoạch định chính sách sử dụng công nghệ truyền thông, dữ liệu, tài liệu, kiến thức và / hoặc mô hình để xác định và giải quyết các vấn đề, hoàn thành các tác vụ xử lý quyết định, và làm quyết định. DSS mô phỏng các chức năng quyết định nhận thức của con người dựa trên phương pháp luận trí tuệ nhân tạo (bao gồm hệ thống chuyên gia, khai thác dữ liệu, máy học, kết nối, lý luận logic, vv) để thực hiện các chức năng hỗ trợ quyết định. DSS là một thuật ngữ chung cho bất kỳ ứng dụng máy tính nào để trợ giúp một người hoặc nhóm khả năng đưa ra quyết định. Ngoài ra, DSS đề cập đến một lĩnh vực nghiên cứu bao gồm việc thiết kế và nghiên cứu DSS trong bối cảnh sử dụng.

### **33. Phân tích chuỗi thời gian (Time Series Analysis)**

**Mã MH:** IT169IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Khoa học giới thiệu các phương pháp cơ bản về phân tích và dự báo chuỗi thời gian. Các chủ đề bao gồm stationary processes, ARMA models, spectral analysis, forecasting using ARMA models, nonstationary and seasonal time series models, multivariate time series, state-space models, and forecasting techniques

#### 34. Lý Thuyết Mạng Máy Tính (Theory of Networks)

**Mã MH:** IT146IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Khóa học giới thiệu sự kết nối của cuộc sống hiện đại, trả lời

câu hỏi làm sao các thế giới xã hội, kinh tế, và công nghệ của chúng ta được kết nối lại với nhau. Sinh viên sẽ nghiên cứu các mô hình mạng hiện đại, chẳng hạn như, lý thuyết trò chơi, cấu trúc của Internet, lan truyền trong xã hội, sự lan truyền của quyền lực xã hội và thông tin phổ biến, và các luồng thông tin.

#### 35. Quản Trị Dự Án CNTT (IT Project Management)

**Mã MH:** IT056IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng, Công nghệ phần mềm

**Mô tả văn tắt nội dung:** Khóa học này cung cấp cho sinh viên kiến thức về quản lý dự án phần mềm cơ bản, đặc biệt chú trọng đến các sản phẩm phần mềm, quản lý dự án và các vấn đề đương đại trong việc cung cấp các giải pháp phần mềm cho doanh nghiệp. Nó xem xét các phương pháp theo kế hoạch (plan-driven) và nhanh (agile), các kỹ thuật ước lượng, quản lý thay đổi, quản lý rủi ro và vai trò của quản lý dự án trong kinh doanh. Và nó xác định các khía cạnh quản lý và báo cáo về quản lý cần thiết từ khi bắt đầu thực hiện dự án phát triển phần mềm.

#### 36. Quản Lý Hệ Thống Thông Tin (Information System Management)

**Mã MH:** IT094IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Nguyên tắc của quản trị cơ sở dữ liệu

**Mô tả văn tắt nội dung:** Tập trung vào cách các doanh nghiệp sử dụng hệ thống thông tin và ảnh hưởng đến hoạt động kinh doanh của doanh nghiệp. Mặc dù công nghệ của các hệ thống thông tin (tức là công nghệ thông tin) được trình bày và thảo luận, vấn đề chính là làm thế nào các công nghệ này được sử dụng để giải quyết các vấn đề kinh doanh và khai thác các cơ hội.

#### 37. Điện Toán Đám Mây (Cloud Computing)

**Mã MH:** IT164IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Môn học này giới thiệu các khái niệm cơ bản về điện toán đám mây di động bao gồm công nghệ tính toán di động trên điện thoại thông minh, công nghệ điện toán đám mây trên trung tâm dữ liệu, sự kết hợp của điện thoại di động và điện toán đám mây và các ứng dụng, và lập trình trên điện thoại thông minh sử dụng dịch vụ trung tâm dữ liệu. Thông qua bài giảng trên lớp, bài thực hành, bài tập nhỏ và lớn, sinh viên có kiến thức về lập trình trên điện thoại thông minh, các nền tảng điện toán đám mây, công nghệ hỗ trợ cho điện toán đám mây di động và ứng dụng. Các bài thực hành tập trung vào nền tảng Java, Android và khai thác dịch vụ điện toán đám mây và dịch vụ Internet vận hành trên một số trung tâm dữ liệu phân tán toàn cầu như: Google, Yahoo, Facebook, iTunes, Amazon, eBay, Bing, etc.

### 38. Blockchain

**Mã MH:** IT150IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Môn học này giới thiệu cho sinh viên kiến thức cơ bản về công nghệ blockchain và các ứng dụng. Sinh viên sẽ được học các khái niệm về blockchain và các nguyên lý hoạt động của blockchain. Môn học này sẽ đề cập tất cả các vấn đề liên quan đến blockchain. Bắt đầu bằng việc cung cấp nền tảng về blockchain, cryptography, và các kiến thức cơ bản về bitcoins. Sau đó, các ứng dụng của công nghệ blockchain trong các lĩnh vực khác nhau như tài chính, y tế, chuỗi cung ứng ... cũng được giới thiệu. Một bức tranh toàn diện về hệ sinh thái xung quanh công nghệ blockchain technology và các xu hướng phát triển cũng được đề cập.

### 39. Khởi Nghiệp (Entrepreneurship)

**Mã MH:** IT120IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Không

**Mô tả văn tắt nội dung:** Nội dung môn học bao gồm: Giới thiệu về kinh tế vĩ mô, vi mô; các thách thức và rủi ro của doanh nghiệp mới, đặc biệt là doanh nghiệp công nghệ; cách thức chọn lựa loại hình doanh nghiệp và tổ chức cấu trúc doanh nghiệp; hoạch định chiến lược và xây dựng phương án vốn; kiểm soát nội bộ và kiểm soát rủi ro; quản lý tài chính và xây dựng hệ thống kế toán; điều hành doanh nghiệp và quan hệ với bên ngoài; xây dựng phương án kinh doanh và cách thức đánh giá hiệu quả hoạt động; kỹ năng làm việc nhóm và hợp tác trong một doanh nghiệp công nghệ.

### 40. Tối ưu hóa và Ứng dụng (Optimization and Applications)

**Mã MH:** IT163IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Không

**Mô tả vắn tắt nội dung:** Khóa học này là giới thiệu các phương pháp cơ bản được sử dụng trong các hoạt động xác định nghiên cứu và sử dụng phân tích số và đại số tuyến tính để giải quyết công nghiệp vấn đề kỹ thuật. Các chủ đề cần được đề cập bao gồm: công thức vấn đề, phương thức simplex trong bảng mẫu, lý thuyết nhị nguyên, giới thiệu về hình học của phương thức simplex, phân tích độ nhạy, vận chuyển và lưu lượng mạng.

#### 41. Công nghệ phần mềm (Software engineering)

**Mã MH:** IT076IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Lập trình hướng đối tượng, Nguyên tắc của quản trị cơ sở dữ liệu

**Mô tả vắn tắt nội dung:** Khoa học này cung cấp cho sinh viên những kiến thức cơ bản về các khái niệm, phương pháp và qui trình của Kỹ thuật phần mềm. Nó bao gồm các môn học về mô hình quy trình phần mềm, phương pháp phát triển linh hoạt (agile), mô hình kỹ thuật và phân tích yêu cầu, phương pháp thiết kế và phát triển phần mềm, chiến lược kiểm thử và đánh giá phần mềm.

Sinh viên áp dụng các phương pháp phân tích yêu cầu, lập kế hoạch, thiết kế, triển khai và kiểm thử linh hoạt hiện đại vào công việc của dự án kỹ thuật phần mềm trong các nhóm nhỏ.

#### 42. Toán rời rạc (Discrete Mathematics)

**Mã MH:** IT153IU

**Số tín chỉ:** 3 (3,0)

**Môn học trước:** Toán 1, Lập trình cơ bản

**Mô tả vắn tắt nội dung:** Môn học này cung cấp cho sinh viên những kiến thức cơ bản về toán rời rạc. Nhằm phát triển khả năng lập luận và suy nghĩ theo cách toán học và logic. Đây là môn học có hướng ứng dụng dựa trên việc nghiên cứu các sự kiện xảy ra theo cách rời rạc trong các lĩnh vực kinh doanh, công nghiệp, và các lĩnh vực số. Sinh viên sẽ được giới thiệu với các công cụ toán học như logic và lý thuyết tập hợp, lý thuyết số và lý thuyết đồ thị. Ứng dụng thực tế sẽ được giới thiệu trong suốt khóa học.

#### 43. Xử lý ngôn ngữ tự nhiên (Natural Language Processing)

**Mã MH:** IT170IU

**Số tín chỉ:** 4 (3,1)

**Môn học trước:** Cấu trúc dữ liệu và giải thuật; Nguyên tắc của quản trị cơ sở dữ liệu; Phân tích dữ liệu

**Mô tả vắn tắt nội dung:** Môn học cung cấp cho học viên kiến thức nền tảng về phương pháp xử lý ngôn ngữ tự nhiên. Đồng thời, các hướng tiếp cận mới theo hướng máy học, học sâu cho xử lý ngôn ngữ tự nhiên cũng được giới thiệu

#### **44. Thực tập (Internship)**

**Mã MH:** IT082IU

**Số tín chỉ:** 2 (2,0)

**Điều kiện:** Sinh viên làm thực tập vào cuối năm 3

**Mô tả văn tắt nội dung:** Sinh viên năm thứ 3 hoặc 4 đăng ký môn thực tập tốt nghiệp vào các học kỳ hè. Môn học này yêu cầu sinh viên làm việc tại các tổ chức hoặc doanh nghiệp liên quan đến CNTT từ tháng 6 đến tháng 9. Mỗi sinh viên có 1 giảng viên hướng dẫn ở Khoa và 1 người hướng dẫn ở tổ chức hoặc doanh nghiệp để thực hiện một dự án kỹ thuật, đồng thời tham gia học tập các kỹ năng mềm khác. Thời gian thực tập tối thiểu là 8 tuần và 3 buổi/tuần và sinh viên báo cáo tiến độ cho giảng viên hướng dẫn sau 3 tuần nhận dự án. Tùy theo yêu cầu dự án của tổ chức hoặc doanh nghiệp, sinh viên có thể thu xếp làm thời gian dài hơn. Cuối thời gian thực tập, sinh viên nộp báo cáo thực tập và báo cáo đánh giá từ người hướng dẫn ở tổ chức hoặc doanh nghiệp về cho Khoa. Giảng viên hướng dẫn đọc báo cáo và xác nhận điểm môn thực tập cho sinh viên. Ngoài ra, sinh viên cũng có thể đăng ký môn này trong các học kỳ chính hoặc tham gia thực tập ở doanh nghiệp nước ngoài với thời gian 6 tháng nếu thu xếp được thời gian. Quy trình đăng ký và đánh giá cũng tương tự.

#### **45. Thực tập tốt nghiệp (Special Study on the Field) và Luận văn tốt nghiệp (Thesis)**

**Mã MH:** Đồ án môn học: IT083IU; Luận văn tốt nghiệp: IT058IU

**Số tín chỉ:** 13 (Đồ án môn học: 3 tín chỉ, Luận văn tốt nghiệp: 10)

**Điều kiện:** sinh viên đủ 96 tín chỉ có thể làm đồ án môn học, đủ 120 tín chỉ có thể làm luận văn

**Mô tả văn tắt nội dung:** Luận án là các dự án loại công nghiệp, được thiết kế để đảm bảo sinh viên đã nắm vững các môn học của mình trong chương trình. Tất cả các dự án đều dựa trên các "dự án thực tế" do ngành công nghiệp cung cấp cho sinh viên để làm việc phát triển kỹ năng và áp dụng kiến thức thu được từ tất cả các khóa học trong suốt chương trình. Sinh viên sẽ làm việc độc lập để phát triển các yêu cầu, thiết kế, thực hiện và cung cấp giải pháp cho các vấn đề kinh doanh. Sinh viên có thể theo bất kỳ mô hình quy trình thích hợp nào, phải tự quản lý dự án, theo tất cả các kỹ thuật quản lý dự án phù hợp. Thành công của dự án được xác định phần lớn bởi việc sinh viên có giải quyết được vấn đề của khách hàng một cách đầy đủ hay không.

Sinh viên sẽ cung cấp các sản phẩm cuối cùng với tất cả các hiện vật phù hợp với mô hình quy trình đang sử dụng (ví dụ: kế hoạch dự án, yêu cầu kỹ thuật, tài liệu kiến trúc hệ thống và phần mềm, tài liệu thiết kế, kế hoạch kiểm thử, mã nguồn và các sản phẩm phần mềm cài đặt).

#### **46. Thực tập tốt nghiệp 2 (Special Study on the Field 2)**

**Mã MH:** IT168IU

**Số tín chỉ:** 3 (0,3)

**Điều kiện:** Sinh viên làm đồ án vào cuối năm 4

**Mô tả văn tắt nội dung:** Khóa học này cho phép sinh viên chọn một môn học dưới sự hướng dẫn của giảng viên. Các dự án cho phép sinh viên đi sâu vào nghiên cứu nâng cao và ứng dụng thực tế trong lĩnh vực nghiên cứu của họ, đưa ra một giải pháp thay thế cho luận án truyền thống. Học

sinh sẽ phát triển kiến thức và kỹ năng chuyên sâu trong khi tập trung vào một chủ đề cụ thể mà họ lựa chọn.

**TRƯỞNG KHOA****Nguyễn Văn Sinh****KT. HIỆU TRƯỞNG****PHÓ HIỆU TRƯỞNG****Đinh Đức Anh Vũ**

## PHỤ LỤC 1

### NỘI DUNG ĐIỀU CHỈNH CHƯƠNG TRÌNH ĐÀO TẠO NGÀNH KHOA HỌC DỮ LIỆU KHÓA 2023 SO VỚI KHÓA 2022

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

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

- Loại bỏ 09 môn như sau:

STT	Mã môn	Tên môn	Số tín chỉ	Ghi chú
1	PH013IU	Physics 1	2	
2	PH014IU	Physics 2	2	
3	MA003IU	Calculus 2	4	
4	CH011IU	Chemistry for Engineering	3	
5	CH012IU	Chemistry Laboratory	1	
6	PE008IU	Critical thinking	3	
7	PE014IU	Environmental Science	3	
8	IT152IU	Data mining for IoT	4	
9	IT142IU	Analytics for Observational Data	4	

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

- Bổ sung thêm 07 môn như sau:

STT	Mã môn	Tên môn tiếng Việt	Tên môn	Số tín chỉ	Ghi chú
1	PE021IU	Pháp luật đại cương	General law	3	
2	IT171IU	Thống kê nâng cao	Statistical Learning	4	
3	IT169IU	Phân tích chuỗi thời gian	Time Series Analysis	4	

4	IT076IU	Công nghệ phần mềm	Software engineering	4	
5	IT170IU	Xử lý ngôn ngữ tự nhiên	Natural Language Processing	4	
6	IT153IU	Toán rời rạc	Discrete Mathematics	3	
7		Tự chọn tự do	Free elective	4	

### 3. Các điều chỉnh khác: Thay đổi tên môn học

<b>Tên môn học cũ</b>					
<b>STT</b>	<b>Mã môn</b>	<b>Tên môn tiếng Việt</b>	<b>Tên môn</b>	<b>Số tín chỉ</b>	<b>Ghi chú</b>
1	IT162IU	Nền tảng máy học	Machine learning platform	4	
2	IT161IU	Công nghệ dữ liệu lớn	Big data Technology	4	
3	IT147IU	Điện toán đám mây di động	Mobile Cloud Computing	4	
<b>Tên môn học mới</b>					
<b>STT</b>	<b>Mã môn</b>	<b>Tên môn tiếng Việt</b>	<b>Tên môn</b>	<b>Số tín chỉ</b>	<b>Ghi chú</b>
1	IT172IU	Học máy	Machine learning	4	
2	IT173IU	Phân tích dữ liệu lớn	Big data Analytics	4	
3	IT164IU	Điện toán đám mây	Cloud Computing	4	

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

<b>STT</b>	<b>CTĐT năm 2022</b>	<b>CTĐT năm 2023</b>
1	Calculus 2 (4 tín chỉ)	1 môn elective (4 tín chỉ) hoặc học chung với Khoa khác

2	Analytics for Observational Data (4 tín chỉ)	Time Series Analysis (4 tín chỉ) hoặc Machine Learning (4 tín chỉ) hoặc Big data Analytics (4 tín chỉ).
3	Physics 1 (3 tín chỉ) or Physics 2 (3 tín chỉ)	Elctive (tối thiểu 3 tín chỉ) hoặc học chung với Khoa khác
4	Chemistry for Engineering (3 tín chỉ) Chemistry Laboratory (1 tín chỉ)	Elective (4 tín chỉ) hoặc học chung với Khoa khác
5	Machine learning platform (4 tín chỉ)	Machine learning (4 tín chỉ)
6	Big data Techniloy (4 tín chỉ)	Big data Analytics (4 tín chỉ)
7	Mobile Cloud Computing (4 tín chi)	Cloud Computing (4 tín chỉ)

## PHỤ LỤC 2: ĐỀ CƯƠNG CHI TIẾT CÁC MÔN HỌC

(Kèm theo Quyết định số: /QĐ-DHQQT 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. 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 hours <sup>1</sup> : 60
Credit points	4

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

Required and recommended prerequisites for joining the course	None								
Course objectives	<p>1. To provide students with the main ideas and techniques of calculus. These include limits, continuity, differentiation, and integration.</p> <p>2. To introduce practical applications of these ideas and techniques, through practical examples taken from many areas of engineering, business, and life sciences.</p> <p>3. To develop skills in mathematical modelling and problem solving, ability to think logically, and adapt these skills creatively to new situations</p>								
Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th><th><b>Course learning outcome (CLO)</b></th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO1. Have basic knowledge of limits and derivatives (Program outcomes: a) CLO2. Have basic knowledge of definite/indefinite integrals (Program outcomes: a)</td></tr> <tr> <td>Skill</td><td>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)</td></tr> <tr> <td>Attitude</td><td>CLO5. Confident when dealing with derivatives and integrals. Comfortable with using derivatives and integrals in practical situations. (Program outcome: j, k)</td></tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	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)
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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	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (4 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Functions and Graphs, Inverse Functions, Exponential and Logarithmic Functions</td><td>1</td><td>I, T</td></tr> <tr> <td>Parametric Curves, Limit. One-sided Limits, Laws of Limits.</td><td>1</td><td>I, T</td></tr> <tr> <td>Evaluating Limits. The Squeeze Theorem. Continuity. The Intermediate Value Theorem</td><td>1</td><td>T, U</td></tr> <tr> <td>Tangent Lines and Velocity Problems. Rates of Change, Derivative.</td><td>1</td><td>T, U</td></tr> <tr> <td>Higher-Order Derivatives, Rules of Differentiation. Rates of Change in the Natural and Social Sciences</td><td>1</td><td>T, U</td></tr> <tr> <td>Implicit Differentiation, Differentiation of Inverse Functions,</td><td>1</td><td>T, U</td></tr> <tr> <td>Logarithmic Differentiation, Linear Approximations. Differentials.</td><td>1</td><td>T, U</td></tr> <tr> <td>Related Rates, Maxima and Minima. Critical Point, The Mean Value Theorem.</td><td>1</td><td>T, U</td></tr> <tr> <td>The First and Second Derivative Test, Concavity. Shapes of Curves, Curve Sketching</td><td>1</td><td>T, U</td></tr> <tr> <td>Indeterminate Forms and l'Hôpital's Rules, Maxima and Minima Problems, Newton's Method</td><td>1</td><td>T, U</td></tr> <tr> <td>Anti-derivatives and Indefinite Integrals, The Definite Integral</td><td>1</td><td>I, T</td></tr> <tr> <td>Properties of the Definite Integral. The Fundamental Theorem of Calculus, Integration by Substitution</td><td>1</td><td>I, T, U</td></tr> <tr> <td>Integration by Parts, Partial Fractions, Numerical Integration,</td><td>1</td><td>T, U</td></tr> <tr> <td>Improper Integrals, Areas between Curves Areas Enclosed by Parametric Curves</td><td>1</td><td>T, U</td></tr> <tr> <td>Volumes, Arc Length, Applications to Engineering, Economics and Science</td><td>1</td><td>T, U</td></tr> </tbody> </table>	Topic	Weight	Level	Functions and Graphs, Inverse Functions, Exponential and Logarithmic Functions	1	I, T	Parametric Curves, Limit. One-sided Limits, Laws of 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
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Examination forms	Written examination																																																
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																																

Reading list	J. Stewart, <i>Calculus</i> , Thomson Learning, 7 <sup>th</sup> edition, 2012.
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**Course Name: Listening AE1****Course Code: EN008IU****1. General information**

Course designation	<i>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.</i>
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 <sup>2</sup> : 60
Credit points	2
Required and recommended prerequisites for joining the course	Students must fulfil ONE of the following requirements to attend this course: <ul style="list-style-type: none"> <li>• hold TOEFL iBT certificate with score <math>\geq 61</math></li> <li>• hold IELTS certificate with score <math>\geq 5.5</math></li> <li>• complete IE2 course</li> </ul>

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<sup>2</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	<p>There are a number of objectives embedded in various teaching activities in Listening AE1 course:</p> <p>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.</p> <p>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.</p> <p>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.</p>								
Course learning outcomes	<p>Upon the successful completion of this course, students will be able to:</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th><th><b>Course learning outcome (CLO)</b></th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>           CLO1. Remember different strategies and techniques in listening to academic lectures and taking notes.            CLO2. Improve their specialized knowledge of academic lectures         </td></tr> <tr> <td>Skill</td><td>           CLO3. Respond to academic lectures with appropriate strategies            CLO4. Communicate effectively with their classmates and professors.         </td></tr> <tr> <td>Attitude</td><td>           CLO5. Respond to academic lectures with confidence         </td></tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	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
<b>Competency level</b>	<b>Course learning outcome (CLO)</b>								
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	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (2 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Orientation &amp; Introduction of strategies and techniques in note-taking</td><td>2</td><td>I, T, U</td></tr> <tr> <td>Chapter 1: New Trends in Marketing Research</td><td>3</td><td>T, U</td></tr> <tr> <td>Chapter 2: Business Ethics</td><td>3</td><td>T, U</td></tr> <tr> <td>Chapter 3: Trends in Children's Media Use</td><td>2</td><td>T, U</td></tr> <tr> <td>Chapter 4: The Changing Music Industry</td><td>2</td><td>T, U</td></tr> <tr> <td>Chapter 5: The Placebo Effect</td><td>2</td><td>T, U</td></tr> <tr> <td>Midterm Sample Test &amp; Review</td><td>2</td><td>T, U</td></tr> <tr> <td>Chapter 6: Intelligent Machines</td><td>3</td><td>T, U</td></tr> <tr> <td>Chapter 7: Sibling Relationships</td><td>3</td><td>T, U</td></tr> <tr> <td>Chapter 8: Multiple Intelligences</td><td>3</td><td>T, U</td></tr> <tr> <td>Chapter 9: The Art of Graffiti</td><td>3</td><td>T, U</td></tr> <tr> <td>Final Sample Test &amp; Review</td><td>2</td><td>T, U</td></tr> </tbody> </table>	Topic	Weight	Level	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
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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 the blanks, Write short answers, Write a summary paragraph.																																							

<p>Study and examination requirements</p>	<p><i>Attendance</i> Regular on-time attendance in this course is expected. It is compulsory that students attend atleast 80% of the course to be eligible for the final examination.</p> <p><i>Missed tests</i> Students are not allowed to miss any of the tests (both on-going assessment and final test). There are very few exceptions. (Only with extremely reasonable excuses, e.g. certified paper from doctors, may students re-take the tests.)</p> <p><i>Class behavior</i> Students are supposed to: prepare thoroughly for each class in accordance with the syllabus and complete all assignments upon the instructor's request participate fully and constructively in all class activities (and discussions if any) display appropriate courtesy to all involved in the class provide constructive feedback to faculty members regarding their performance</p>
<p>Reading list</p>	<p>[1] Frazie, L., &amp; Leeming, S. (2013). <i>Lecture ready 3</i>. Oxford: Oxford University Press. References: [2] Frazie, L., &amp; Leeming, S. (2013). <i>Lecture ready 1, 2</i>. Oxford: Oxford University Press.</p>

## 2. Learning Outcomes Matrix (optional)

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

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

## 3. Planned learning activities and teaching methods

WEEK	P.	Chapter	Listening oriented activities	Speaking oriented activities
WEEK 1	2	ORIENTATION		

<b>WEEK 2</b>	2	<b><u>Chapter 1</u></b> <b>New Trends in Marketing Research</b>	Recognizing topic introducing and lecture plan presenting expressions Organizing ideas by outlining	Expressing ideas during a discussion
<b>WEEK 3</b>	2	<b><u>Chapter 2</u></b> <b>Business Ethics</b>	Recognizing transition expressions Using symbols and abbreviations	Asking for clarification and elaboration during a discussion
<b>WEEK 4</b>	2	REVIEW		
<b>WEEK 5</b>	2	<b><u>Chapter 3</u></b> <b>Trends in Children's Media Use</b>	Recognizing generalization and support expressions	Giving opinions and asking for opinions during a discussion
<b>WEEK 6</b>	2	<b><u>Chapter 4</u></b> <b>The Changing Music Industry</b>	Recognizing expressions for clarification or emphasis Organizing notes by using a split-page format	Expressing interest and asking for elaboration during a discussion
<b>WEEK 7</b>	2	<b><u>Chapter 5</u></b> <b>The Placebo Effect</b>	Recognizing cause and effect expressions Noting causes and effects	Agreeing and disagreeing during a discussion
<b>WEEK 8</b>	2	SAMPLE TEST CORRECTION WRAP-UP AND REVIEW		
<b>MID-TERM EXAMINATION</b>				
<b>WEEK 9</b>	2	<b><u>Chapter 6</u></b> <b>Intelligent Machines</b>	Recognizing expressions used to predict causes and effects Using arrows to show the relationship between causes and effects	Learning to compromise and reach a consensus during a discussion

<b>WEEK 10</b>	2	REVIEW		
<b>WEEK 11</b>	2	<b><u>Chapter 7</u></b> <b>Sibling Relationships</b>	Recognizing expressions of comparison and contrast Noting comparison and contrast	Expanding on ideas during a discussion
<b>WEEK 12</b>	2	<b><u>Chapter 8</u></b> <b>Multiple Intelligences</b>	Recognizing non-verbal signals indicating important information Representing information in list form	Keeping the discussion on topic
<b>WEEK 13</b>	2	REVIEW		
<b>WEEK 14</b>	2	<b><u>Chapter 9</u></b> <b>The Art of Graffiti</b>	Recognizing expressions of definition Reviewing and practicing all note taking strategies	Indicating to others when preparing to speak or pausing to collect thoughts
<b>WEEK 15</b>	2	WRAP-UP AND REVIEW		
<b>FINAL EXAMINATION</b>				

4.

## 5. Assessment plan

<b>Assessment Type</b>	<b>CLO1</b>	<b>CLO2</b>	<b>CLO3</b>	<b>CLO4</b>	<b>CLO5</b>
<b>On-going assessment (30%)</b> (participation, individual work, group work, assignments, etc.)	80% Pass	80% Pass	80% Pass	80% Pass	80% Pass
<b>Midterm exam (30%)</b>	80% Pass		80% Pass		
<b>Final exam (40%)</b>	80% Pass		80% 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: Writing AE1****Course Code: EN007IU****1. General information**

Course designation	<i>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.</i>
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 <sup>3</sup> : 60
Credit points	2
Required and recommended prerequisites for joining the course	Students must fulfil ONE of the following requirements to attend this course: <ul style="list-style-type: none"> <li>• hold TOEFL iBT certificate with score <math>\geq 61</math></li> <li>• hold IELTS certificate with score <math>\geq 5.5</math></li> <li>• have completed IE2 course</li> </ul>

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<sup>3</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	<p>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.</p>	
Course learning outcomes	<p>Upon the successful completion of this course, students will be able to:</p>	
Competency level	<b>Course learning outcome (CLO)</b>	
Knowledge	<p>CLO1. Understand and follow different steps in the writing process to produce a complete essay            CLO2. Employ different methods to improve their writing such as peer feedback and teacher comments</p>	
Skill	<p>CLO3. Read critically, analyze and annotate an academic text            CLO4. Use different functions of writing to successfully communicate their purposes to the audience (describe a process, discuss the causes and effects, compare and contrast, make arguments, paraphrase and summarize)</p>	
Attitude	<p>CLO5. Reason around ethical issues in writing academic essays and avoid committing plagiarism</p>	

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (2 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th><b>Topic</b></th><th><b>Weigh t</b></th><th><b>Leve l</b></th></tr> </thead> <tbody> <tr> <td>The process of Academic Writing</td><td>1</td><td>I, T, U</td></tr> <tr> <td>Using Outside Sources</td><td>3</td><td>T, U</td></tr> <tr> <td>From Paragraph to Essay</td><td>4</td><td>T, U</td></tr> <tr> <td>Process Essays</td><td>4</td><td>T, U</td></tr> <tr> <td>Cause/Effect Essays</td><td>4</td><td>T, U</td></tr> <tr> <td>Comparison/ Contrast Essays</td><td>4</td><td>T, U</td></tr> <tr> <td>Argumentative Essays</td><td>6</td><td>T, U</td></tr> <tr> <td>Summarizing</td><td>2</td><td>U</td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td>Review &amp; Correction</td><td>2</td><td>U</td></tr> </tbody> </table>	<b>Topic</b>	<b>Weigh t</b>	<b>Leve l</b>	The process of Academic Writing	1	I, T, U	Using Outside Sources	3	T, U	From Paragraph to Essay	4	T, U	Process Essays	4	T, U	Cause/Effect Essays	4	T, U	Comparison/ Contrast Essays	4	T, U	Argumentative Essays	6	T, U	Summarizing	2	U							Review & Correction	2	U
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Summarizing	2	U																																			
Review & Correction	2	U																																			
Examination forms	<p>Essay writing</p>																																				
Study and examination requirements	<p><i>Attendance</i></p> <p>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.</p> <p><i>Missed Tests</i></p> <p>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.</p> <p><i>Class Behaviors</i></p> <p>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:</p>																																				

	<ul style="list-style-type: none"> <li>- Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request.</li> <li>- Participate fully and constructively in all course activities and discussions (if any).</li> <li>- Display appropriate courtesy to all involved in the class.</li> <li>- Provide constructive feedback to faculty members regarding their performance.</li> </ul> <p><i>Plagiarism</i></p> <p>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.</p> <p><i>Writing Center (Room 509)</i></p> <p>Students are encouraged to visit the Writing Center to schedule an appointment for additional help with essay writing.</p>
Reading list	<p>[1] Oshima, A., &amp; Hogue, A. (2017). <i>Longman Academic Writing Series, Level 4: Essays</i> (5<sup>th</sup> ed.). New Jersey, NJ: Pearson Longman.</p> <p>[2] Oshima, A., &amp; Hogue, A. (2006). <i>Longman Academic Writing Series, Level 4: Essays</i> (4<sup>th</sup> ed.). New Jersey, NJ: Pearson Longman.</p>

## 2. Learning Outcomes Matrix (optional)

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

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

Week	Coursebook		Homework
	Chapter	Pages	
1	<b>The process of Academic Writing</b> Step 1: Creating (Prewriting) Step 2: Planning (Outlining) Step 3: Writing Step 4: Polishing  <b>Using Outside Sources</b> Paraphrasing Plagiarism and how to avoid plagiarism	[2] pp. 265-279  [1] pp. 58-65	<ul style="list-style-type: none"> <li>Do revising &amp; editing exercises</li> <li>Read pp. [1] pp. 66-72</li> </ul>
2	<b>Using Outside Sources (Cont'd)</b> Strategies for writing a successful summary	[1] pp. 58 - 72	<ul style="list-style-type: none"> <li>Do paraphrasing exercises</li> <li>Read [1] pp.74-100. Read, take notes and write the summary of ONE of the following articles:               <ul style="list-style-type: none"> <li>The Challenge of Many Languages (p. 280)</li> <li>Nice by Nature? (p. 281)</li> <li>Marital Exchanges (pp. 283-4)</li> <li>Why We Should Send a Manned Mission to Mars (pp.286-7)</li> <li>Let's Not Go to Mars (pp. 288-9)</li> </ul> </li> </ul>
3 & 4	<b>Review/ Correction:</b> Lecturer gives feedback to one or two students' writings in class. <b>From Paragraph to Essay</b> The introductory paragraph: <ul style="list-style-type: none"> <li>General statements &amp; Introductory techniques</li> <li>Thesis statements &amp; Logical division of ideas</li> </ul> Body paragraphs: <ul style="list-style-type: none"> <li>Topic sentences</li> </ul> The concluding paragraph: <ul style="list-style-type: none"> <li>Restatement</li> <li>Final thoughts</li> </ul> Outlines of essays	[1] pp. 74 – 100	<ul style="list-style-type: none"> <li>Read pp. 101-15</li> <li>Do exercises on:               <ul style="list-style-type: none"> <li>Writing thesis statements</li> <li>Writing topic sentences from the thesis statement provided</li> <li>Writing restatements</li> </ul> </li> </ul>

5	<p><b>Process Essays</b></p> <p>Introduction Analyzing the models Thesis statements for process essays Transitional signals <b>Write together:</b> Writing from a diagram (p.115)</p>	[1] pp. 101 - 115	<ul style="list-style-type: none"> <li>• Write a short essay (150-200words) describing how hydroelectric power is generated (or a topic of the lecturer's choice)</li> </ul>
6	<p><b>Process Essays (Cont'd)</b></p> <p><b>Review/ Correction:</b> Lecturer gives feedback to one or two students' writings in class.</p> <p><b>In-class Assignment:</b> Write a process essay about one of these topics or a topic of the lecturer's choice:</p> <ul style="list-style-type: none"> <li>• How to cook a favorite food</li> <li>• How to do a favorite hobby</li> <li>• How to succeed in your major area or professional field</li> <li>• How to accomplish an academic task (register for classes, apply for a scholarship, pass an exam, etc.)</li> </ul>	[1] pp. 101 - 115	<ul style="list-style-type: none"> <li>• Read [1] pp. 116-132</li> </ul>
7	<p><b>Cause/ Effect Essays</b></p> <p>Introduction Analyzing the models Organization Signal words and phrases <b>Write together:</b> Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice:</p> <ul style="list-style-type: none"> <li>• The cause of obesity</li> <li>• The effects of involvement in sports on young children</li> <li>• The causes of stress in college students</li> <li>• The effects of regular reading on students' lives</li> </ul>	[1] pp. 116 - 132	<ul style="list-style-type: none"> <li>• Practice 4, 5,6 /pp. 127-9</li> <li>• Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice. The topic should be different from the one that has been used in class: <ul style="list-style-type: none"> <li>○ The cause of obesity</li> <li>○ The effects of involvement in sports on young children</li> <li>○ The causes of stress in college students</li> <li>○ The effects of regular reading on students' lives</li> </ul> </li> </ul>

	<b>Cause/ Effect Essays</b> <b>(Cont'd) Review/ Correction:</b> Lecturer gives feedback to one or two students' writings in class. <b>In-class Writing:</b> Write the introduction, ONE body paragraph and the conclusion on one of the two topics left (except for the ones that has been worked on in class and assigned as homework) or a topic of the lecturer's choice: <ul style="list-style-type: none"><li>• The cause of obesity</li><li>• The effects of involvement in sports on young children</li><li>• The causes of stress in college students</li></ul> The effects of regular reading on students' lives		<ul style="list-style-type: none"><li>• Give peer-feedback using the rubric provided</li></ul>
<b>MID-TERM EXAMINATION</b>			
9	<b>Comparison/ Contrast Essays</b> Introduction Analyzing the models Organization: <ul style="list-style-type: none"><li>• Points of comparison</li><li>• Point-by-point organization</li><li>• Block organization</li></ul> Comparison and Contrast signal words <b>Write together:</b> Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice: <ul style="list-style-type: none"><li>• Compare and contrast the relationship between parents and children in two different cultures.</li><li>• Compare and contrast the university culture in two different countries.</li><li>• Compare and contrast the culture of a small town and a big city.</li></ul>	[1] pp. 133 - 151	<ul style="list-style-type: none"><li>• Practice 3, 4, 6, 7/pp. 142-6</li><li>• Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice. The topic should be different from the one that has been used in class:<ul style="list-style-type: none"><li>◦ Compare and contrast the relationship between parents and children in two different cultures.</li><li>◦ Compare and contrast the university culture in two different countries.</li><li>◦ Compare and contrast the culture of a small town and a big city.</li></ul></li></ul>

	big city.		
10	<p><b>Comparison/ Contrast Essays(Cont'd)</b></p> <p><b>Review/ Correction:</b> Lecturer gives feedback to one or two students' writings in class.</p> <p><b><u>In-class Assignment:</u></b> Write a compare and contrast essay on the topic left or a topic of the lecturer's choice:</p> <ul style="list-style-type: none"> <li>• Compare and contrast the relationship between parents and children in two different cultures</li> <li>• Compare and contrast the university cultures in two different countries</li> <li>• Compare and contrast the cultures of a small town and a big city</li> </ul>	[1] pp. 133 - 151	<ul style="list-style-type: none"> <li>• Read [1] pp. 152-168</li> </ul>
11 & 12	<p><b>Argumentative Essays</b></p> <p>Introduction Analyzing the model</p>	[1] pp. 152-168	<ul style="list-style-type: none"> <li>• Write an argumentative essay (300 – 350 words) on ONE of the following topics or a topic</li> </ul>

	<p>Organization: Block vs. Point-by-point pattern</p> <p>The elements of an argumentative essay:</p> <ul style="list-style-type: none"> <li>• An explanation of the issue</li> <li>• A clear thesis statement</li> <li>• A summary of the opposing arguments</li> <li>• Rebuttals to the opposing arguments</li> <li>• Your own arguments</li> </ul> <p>The introductory paragraph: Thesis Statement Statistics as support</p> <p><b>Write together:</b> Write the introduction, ONE body paragraph and the conclusion on one of the topics below or a topic of the lecturer's choice:</p> <ul style="list-style-type: none"> <li>• Can same-sex parenting negatively influence a child's mentality?</li> <li>• Do famous artists have an innate talent, or do they put in great effort to improve their skills?</li> <li>• Is homework helpful?</li> </ul>		<p>of the lecturer's choice:</p> <ul style="list-style-type: none"> <li>○ Can same-sex parenting negatively influence a child's mentality?</li> <li>○ Do famous artists have an innate talent, or do they put in great effort to improve their skills?</li> <li>○ Is homework helpful?</li> </ul>
13	<p><b>Argumentative Essays (Cont'd)</b></p> <p><b>Review/ Correction:</b> Lecturer gives feedback to one or two students' writings in class.</p> <p><b>In-class Writing:</b> Write an argumentative essay on the topic left or a topic of the lecturer's choice:</p> <ul style="list-style-type: none"> <li>• Can same-sex parenting negatively influence a child's mentality?</li> <li>• Do famous artists have an innate talent, or do they put in great effort to improve their skills?</li> <li>• Is homework helpful?</li> </ul>		<ul style="list-style-type: none"> <li>• Give peer-feedback using the rubric provided</li> </ul>
14	Review & Practice: Summarizing		Sample final test

15	<b>Review/Correction:</b> Lecturer gives feedback to one or two students' argumentative essays +sample final test in class. Lecturer has students check their own assignment scores.		
<b>FINAL EXAMINATION</b>			

**3. Planned learning activities and teaching methods**

**Course Name: Introduction to Data Science**  
**Course Code: IT135IU**

**1. General information**

Course designation	<i>This subject will provide a broad introduction to four key aspects of data science: data retrieval and manipulation, data visualization, statistical computation and machine learning, and presentation and communication.</i>
Semester(s) in which the course is taught	1, 2
Person responsible for the course	Dr. Nguyen, Thi Thanh Sang
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 70 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 45 Private study including examination preparation, specified in hours <sup>4</sup> : 25
Credit points	3
Required and recommended prerequisites for joining the course	None

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<sup>4</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course objectives	<p>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.</p>			
Course learning outcomes	Upon the successful completion of this course students will be able to:			
	<table border="1"> <thead> <tr> <th><b>Competency level</b></th><th><b>Course learning outcome (CLO)</b></th></tr> </thead> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	
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<table border="1"> <tbody> <tr> <td>Skill</td><td>CLO3. Carry out basic statistical modeling and analysis using open-source data analysis tools.</td></tr> <tr> <td>Attitude</td><td>CLO4. Reason around ethical and privacy issues in data science conduct and apply ethical practices.</td></tr> </tbody> </table>	Skill	CLO3. Carry out basic statistical modeling and analysis using open-source data analysis tools.	Attitude	CLO4. Reason around ethical and privacy issues in data science conduct and apply ethical practices.
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th><b>Topic</b></th><th><b>Weigh t</b></th><th><b>Leve l</b></th></tr> </thead> <tbody> <tr> <td>Introduction to Data Science</td><td>1</td><td>I</td></tr> <tr> <td>Introduction to Descriptive Statistics</td><td>2</td><td>T, U</td></tr> <tr> <td>Hypothesis Testing and Statistical Inference</td><td>1</td><td>T</td></tr> <tr> <td>Exploratory Data Analysis and the Data Science Process</td><td>2</td><td>T, U</td></tr> <tr> <td>Classification 1: Linear &amp; Logistic Regression and K-Nearest Neighbors</td><td>2</td><td>T, U</td></tr> <tr> <td>Classification 2: Decision trees and Support Vector Machine</td><td>2</td><td>T, U</td></tr> <tr> <td>Clustering and Dimensionality Reduction</td><td>1</td><td>T, U</td></tr> <tr> <td>Recommendation Systems</td><td>1</td><td>T, U</td></tr> <tr> <td>Data Visualization</td><td>0.5</td><td>I</td></tr> <tr> <td>Data Science and Ethical Issues</td><td>0.5</td><td>I</td></tr> </tbody> </table>	<b>Topic</b>	<b>Weigh t</b>	<b>Leve l</b>	Introduction to Data Science	1	I	Introduction to Descriptive Statistics	2	T, U	Hypothesis Testing and Statistical Inference	1	T	Exploratory Data Analysis and the Data Science Process	2	T, U	Classification 1: Linear & Logistic Regression and K-Nearest Neighbors	2	T, U	Classification 2: Decision trees and Support Vector Machine	2	T, U	Clustering and Dimensionality Reduction	1	T, U	Recommendation Systems	1	T, U	Data Visualization	0.5	I	Data Science and Ethical Issues	0.5	I
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Data Science and Ethical Issues	0.5	I																																
Examination forms	Multiple-choice questions, short-answer questions																																	
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																	

Reading list	[1] Jeffrey M.Stanton, <i>Introduction to Data Science</i> , Syracuse University, 2013. [2] Cathy O'Neil, Rachel Schutt, <i>Doing Data Science: Straight Talk from the Frontline</i> , O'Reilly Media, 2013. [3] Joel Grus, <i>Data Science from Scratch: First Principles with Python</i> , O'Reilly Media, 2015. [4] Jiawei Han, Micheline Kamber, <i>Data Mining: Concepts and Techniques</i> , 3 <sup>rd</sup> Edition, Morgan Kaufmann, 2011. [5] Matt Harrison, <i>Learning the Pandas Library: Python Tools for Data Munging, Analysis, and Visualization</i> , CreateSpace Independent Publishing Platform, 2016.
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## 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	x						
2	x						
3						x	
4				x			

## 3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessments	Learning activities	Resources
1	Introduction to Data Science	1, 4	Quiz1	Lecture, Discussion, Inclass-Quiz	[1].0. [2].1.
2-3	Introduction to Descriptive Statistics	3	HW1	Lecture, Inclass-Quiz, HW	[1].9.
4	Hypothesis Testing and Statistical Inference	3	Quiz4	Lecture, Group work	[2].2.
5-6	Exploratory Data Analysis and the Data Science Process	2	HW2, Quiz6	Lecture, Group work, HW	[1]. 2, 4 [2]. 2
7			HW2 presentation	Presentation	
8,10	Classification 1: Linear & Logistic Regression and K-Nearest Neighbors	3		Lecture, Group work	[2]. 3

9	Midterm				
11-12	Classification 2: Decision trees and Support Vector Machine	3	HW3	Lecture, Group work, HW	[2]. 4. [1]. 18.
13	Clustering and Dimensionality Reduction	3		Lecture, Group work	[3]. 10
14	Recommendation Systems	3	HW4	Lecture, Discussion, HW	[2]. 8
15	Data Visualization Data Science and Ethical Issues	3,4	Quiz15	Lecture, Inclass-Quiz	[1]. 12, 13 [2]. 9, 16
16	Revision			Review-Test	
17	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
In-class exercises/quizzes (10%)	Qz1 60%Pass	Qz6 60%Pass		Qz15 60%Pass
Homework exercises (20%)	HW2 50%Pass		HW1, HW3, HW4 50%Pass	
Midterm exam (30%)		Q3 50%Pass	Q1, Q2 50%Pass	
Final exam (40%)	Part I 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				
Student: .....	HW/Assignment: .....	Date: .....	Evaluator: .....	
		Max.	Score	Comments
<b>Technical content (60%)</b>				
Abstract clearly identifies purpose and summarizes principal content		10		
Introduction demonstrates thorough knowledge of relevant background and prior work		15		
Analysis and discussion demonstrate good subject mastery		30		

Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>			
<b>TOTAL SCORE</b>	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	
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively , delivering all	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	Issue/ problem to be considered critically is stated without clarification or description.	

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

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

Source: Association of American Colleges and Universities

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	4	3	2	1

<b>Organization</b>	Organizationa l 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.	Organizationa l pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizationa l pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears 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

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

Source: Association of American Colleges and Universities

**6. Date revised: January 12, 2022**

**Ho Chi Minh City, 12/01/2022**

**Dean of School** 



**Nguyen Van Sinh**

**Course Name: Fundamentals of Programming**  
**Course Code: IT149IU**

**1. General information**

Course designation	Learning the basics of programming								
Semester(s) in which the course is taught	2								
Person responsible for the course	Assoc. Prof. Nguyen Thi Thuy Loan, Dr.								
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	None								
Course objectives	This course concentrates on learning the basics of programming languages which is the foundation for further studies. The course enables students to get familiar with the Python programming language. The course covers all basic Python data structures, control flows, module and introduction to OOP in Python								
Course learning outcomes	CLO 1. Understand programming languages and applications, how applications work CLO 2. Able to write applications using Python CLO 3. Understand basic data structure of Python programming								
	<table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>1</td></tr> <tr> <td>Skill</td><td>2, 3</td></tr> <tr> <td>Attitude</td><td></td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	1	Skill	2, 3	Attitude	
Competency level	Course learning outcome (CLO)								
Knowledge	1								
Skill	2, 3								
Attitude									

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr><td>Introduction to Programming Language</td><td>3</td><td>I</td></tr> <tr><td>Introduction to Python Programming</td><td>3</td><td>I, T</td></tr> <tr><td>Data Types and Variables in Python</td><td>3</td><td>T, U</td></tr> <tr><td>Numbers and Operators in Python</td><td>3</td><td>T, U</td></tr> <tr><td>Control Flow: Branching Statements</td><td>3</td><td>T, U</td></tr> <tr><td>Control Flow: Loops</td><td>3</td><td>T, U</td></tr> <tr><td>Lists in Python</td><td>3</td><td>T, U</td></tr> <tr><td>Tuples in Python</td><td>3</td><td>T, U</td></tr> <tr><td>Sets in Python</td><td>3</td><td>T, U</td></tr> <tr><td>Functions</td><td>3</td><td>T, U</td></tr> <tr><td>Modules</td><td>3</td><td>T, U</td></tr> <tr><td>File Handling</td><td>3</td><td>T, U</td></tr> <tr><td>Exception Handling</td><td>3</td><td>T, U</td></tr> <tr><td>Object and Classes in Python</td><td>3</td><td>T, U</td></tr> <tr><td>Inheritance and Polymorphism</td><td>3</td><td>T, U</td></tr> </tbody> </table>			Topic	Weight	Level	Introduction to Programming Language	3	I	Introduction to Python Programming	3	I, T	Data Types and Variables in Python	3	T, U	Numbers and Operators in Python	3	T, U	Control Flow: Branching Statements	3	T, U	Control Flow: Loops	3	T, U	Lists in Python	3	T, U	Tuples in Python	3	T, U	Sets in Python	3	T, U	Functions	3	T, U	Modules	3	T, U	File Handling	3	T, U	Exception Handling	3	T, U	Object and Classes in Python	3	T, U	Inheritance and Polymorphism	3	T, U
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Inheritance and Polymorphism	3	T, U																																																	
Examination forms	Multiple-choice questions, short-answer questions																																																		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																																		
Reading list	Eric Matthes, Python Crash Course: A Hands-On, Project-Based Introduction to Programming, 2nd Edition, No Starch Press, 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:

CLO\SLO T	1	2	3	4	5	6
1	x					

2		xx				
3		xx				

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Programming Language	1	Quiz	Lecture	1
2	Introduction to Python Programming	1	Quiz	Lecture	1
3	Data Types and Variables in Python	1	Quiz	Lecture	1
4	Numbers and Operators in Python	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
5	Control Flow: Branching Statements	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
6	Control Flow: Loops	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
7	Lists in Python	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
8	Tuples in Python	2, 3	Quiz, Lab, Midterm	Lecture, Discussion, In-class Exercise	1
<b>Midterm</b>					
9	Sets in Python	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1
10	Functions	2, 3	Quiz, Lab, Final	Lecture, Discussion, In-class Exercise	1

11	Modules	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
12	File Handling	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
13	Exception Handling	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
14	Object and Classes in Python	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
15	Inheritance and Polymorphism	2, 3	Quiz, Lab, Final	Lecture, Discussion , In-class Exercise	1
<b>Final</b>					

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz / Assignment (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.

- 
- When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.↔

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports	
Student: .....	HW/Assignment: .....

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

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	Capstone	Milestone	Benchmark
	4	3	2

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

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

Source: Association of American Colleges and Universities

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

	Capstone	Milestone	Benchmark
	4	3	2

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

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

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

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



Nguyen Van Sinh

**Course Name: Philosophy Marx - Lenin****Course Code: PE015IU****1. Thông tin chung**

Tên môn học (tiếng Việt):	Triết học Mác-Lênin
Tên môn học (tiếng Anh):	Philosophy Marx – Lenin
Mã số môn học:	PE015IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	3
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

**2. Mục tiêu môn học**

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**

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

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

		LO.2.4 - Hiểu được phép biến chứng và phép biến chứng duy vật	2.1		
		LO.2.5 - Hiểu rõ được hai nguyên lý cơ bản của phép biến chứng duy vật và rút ra ý nghĩa phương pháp luận của từng nguyên lý	2.1 2.2		
		LO.2.6 - Hiểu rõ được các cặp phạm trù cơ bản của phép biến chứng duy vật và rút ra ý nghĩa phương pháp luận từng cặp phạm trù	2.1 2.2		
		LO.2.7 - Hiểu rõ được các quy luật cơ bản của cơ bản của phép biến chứng duy vật và rút ra ý nghĩa 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		

### 5.2. Kỹ năng

LO.4	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.4.1. Có kỹ năng khái quát hóa để rút ra <i>Từ khóa tri thức</i> đối với mỗi nội dung và tư duy có hệ thống  LO.4.2. Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn  LO.4.3. Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức	2.1 2.2	2.1.1 2.3.1  2.4.4  2.5 3.1.5	U4
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		và kinh nghiệm, khả năng điều hành nhóm làm việc			
<b>5.3. Thái độ</b>					
LO.5	THẾ HIỆN Ý THÚC, NHẬN THÚC TRONG VÀ SAU KHI HỌC TẬP	<p>LO.5.1. Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng, nhân văn của CN Mác - Lê nin</p> <p>LO.5.2. Có ý thức, trách nhiệm cá nhân đối với tập thể, cộng đồng</p> <p>LO.5.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong cuộc sống.</p>	2.1 2.2	3.1	U3
LO.3	CHỦ NGHĨA DUY VẬT LỊCH SỬ	<p>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</p> <p>LO.3.2 - Hiểu rõ được mối quan hệ biện chứng giữa lực lượng sản xuất và quan hệ sản xuất</p> <p>LO.3.3 - Hiểu rõ được mối quan hệ biện chứng giữa CSHT và KTTT; sự phát triển tự nhiên của các hình thái KT-XH</p> <p>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</p> <p>LO.3.5 - Hiểu rõ được nhà nước và mạng xã hội</p> <p>LO.3.6 - Hiểu rõ được mối quan hệ biện chứng giữa tồn tại xã hội và ý thức xã hội</p>	2.1 2.2	1.1.3	T4

		LO.3.7 - Hiểu rõ được con người bản chất con người; hiện tượng tha hóa và giải phóng con người mối quan hệ giữa cá nhân và xã hội, vai trò của quần chúng nhân dân		
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## 6. Kế hoạch giảng dạy theo buổi học

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.4;	<p><b>Dạy:</b></p> <ul style="list-style-type: none"> <li>- Giới thiệu đề cương môn học</li> <li>- Giới thiệu nội dung đề tài thuyết trình nhóm GHW)</li> </ul> <p><b>Học ở lớp:</b></p> <ul style="list-style-type: none"> <li>- Chia nhóm (5 sv/nhóm)</li> <li>- Giới thiệu nhóm học tập</li> </ul> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Chọn đề tài thuyết trình của nhóm (GHW)</li> </ul> <p>Đọc trước tài liệu chương 1.</p>	
2 (15 tiết)	Chương 1 TRIẾT HỌC VÀ VAI TRÒ CỦA TRIẾT HỌC TRONG ĐỜI SỐNG XÃ HỘI	LO.1; LO.4 LO.5	<p><b>Dạy:</b></p> <p><b>1. TRIẾT HỌC VÀ VÂN ĐỀ CƠ BẢN CỦA TRIẾT HỌC</b></p> <ol style="list-style-type: none"> <li>1. Khái lược về triết học</li> <li>2. Vấn đề cơ bản của triết học</li> <li>3. Biện chứng và siêu hình</li> </ol> <p><b>II. TRIẾT HỌC MÁC - LÊNIN VÀ VAI TRÒ CỦA TRIẾT HỌC MÁC - LÊNIN TRONG ĐỜI SỐNG XÃ HỘI</b></p> <ol style="list-style-type: none"> <li>1. Sự ra đời và phát triển của triết học Mác - Lê nin</li> <li>2. Đổi tượng và chức năng của triết học Mác - Lê nin</li> <li>3. Vai trò của triết học Mác - Lê nin trong đời sống xã hội và trong sự nghiệp đổi mới ở Việt Nam hiện nay</li> </ol> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Phác thảo nội dung thuyết trình nhóm GHW</li> </ul> <p>Đọc trước tài liệu chương 2.</p>	Thi giữa kỳ (Quiz)

3 (15 tiết)	<b>Chương 2 CHỦ NGHĨA DUY VẬT BIỆN CHỨNG</b>	LO.2 LO.4 LO.5	<p><b>Dạy:</b></p> <p><b>I. VẬT CHẤT VÀ Ý THỨC</b></p> <ol style="list-style-type: none"> <li>1. Vật chất và các hình thức tồn tại của vật chất</li> <li>2. Nguồn gốc, bản chất và kết cấu của ý thức</li> <li>3. Mối quan hệ giữa vật chất và ý thức</li> </ol> <p><b>II. PHÉP BIỆN CHỨNG DUY VẬT</b></p> <ol style="list-style-type: none"> <li>1. Hai loại hình biện chứng và phép biện chứng duy vật</li> </ol> <p>Nội dung của phép biện chứng duy vật</p> <p><b>III. LÝ LUẬN NHẬN THỨC</b></p> <ol style="list-style-type: none"> <li>1. Các nguyên tắc của lý luận nhận thức duy vật biện chứng</li> <li>2. Nguồn gốc, bản chất của nhận thức</li> <li>3. Thực tiễn và vai trò của thực tiễn đối với nhận thức</li> <li>4. Các giai đoạn cơ bản của quá trình nhận thức Chân lý</li> </ol> <p><b>Học ở Lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 3</p>	Thi giữa kỳ (Quiz)  Thi cuối kỳ (FEX)
4 (14 tiết)	<b>Chương 3 CHỦ NGHĨA DUY VẬT LỊCH SỬ</b>	L0.3 L0.4 L0.5	<p><b>Dạy:</b></p> <p><b>I. HỌC THUYẾT HÌNH THÁI KINH TẾ - XÃ HỘI</b></p> <ol style="list-style-type: none"> <li>1. Sản xuất vật chất là cơ sở của sự tồn tại và phát triển xã hội</li> <li>2. Biện chứng giữa lực lượng sản xuất và quan hệ sản xuất</li> <li>3. Biện chứng giữa cơ sở hạ tầng và kiến trúc thượng tầng của xã hội</li> <li>4. Sự phát triển các hình thái kinh tế - xã hội là một quá trình lịch sử - tự nhiên</li> </ol> <p><b>II. GIAI CẤP VÀ DÂN TỘC 160</b></p> <ol style="list-style-type: none"> <li>1. Vấn đề giai cấp và đấu tranh giai cấp</li> <li>2. Dân tộc</li> <li>3. Mối quan hệ giai cấp - dân tộc - nhân loại</li> </ol> <p><b>III. NHÀ NƯỚC VÀ CÁCH MẠNG XÃ HỘI</b></p> <ol style="list-style-type: none"> <li>1. Nhà nước</li> <li>2. Cách mạng xã hội</li> </ol> <p><b>IV. Ý THỨC XÃ HỘI</b></p> <ol style="list-style-type: none"> <li>1. Khái niệm tồn tại xã hội và các yếu tố cơ bản của tồn tại xã hội</li> <li>2. Ý thức xã hội và kết cấu của ý thức xã hội</li> </ol> <p><b>V. TRIẾT HỌC VỀ CON NGƯỜI</b></p> <ol style="list-style-type: none"> <li>1. Khái niệm con người và bản chất con người</li> <li>2. Hiện tượng tha hóa con người và vấn đề giải phóng con người</li> <li>3. Quan hệ cá nhân và xã hội; vai trò của quần</li> </ol>	Thuyết trình nhóm (GHW)  Thi cuối kỳ (FEX)

			<p>chúng nhân dân và lãnh tụ trong lịch sử Vân đề con người trong sự nghiệp cách mạng ở Việt Nam</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp <b>Học ngoài lớp:</b> Hoàn thiện bài thuyết trình</p>	
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### 7. Đánh giá môn học

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

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

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết được sự đối lập giữa chủ nghĩa duy vật và chủ nghĩa duy tâm trong việc giải quyết vấn đề cơ bản của triết học; vai trò của triết học Mác – Lê nin	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	Chương 2	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của GV

	của phép biện chứng duy vật			
LO.3	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
LO.4				

### 9. Một số lưu ý khác:

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

Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký để 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: Statistical Method****Course Code: IT151IU****1. General information**

Course designation	This subject introduces the students to the fundamentals of probability and statistics and several related algorithms popularly used in data analytics and signal processing. It is designed for practical aspect.
Semester(s) in which the course is taught	2,4
Person responsible for the course	Mai Hoang Bao An, PhD.
Language	English
Relation to curriculum	Compulsory
Teaching methods	Lecture, lesson, project, seminar.
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 1 Fundamentals of programming
Course objectives	Provides students with a background in the statistical methods that assist in the analysis of data, including summarizing and describing data and techniques for inference and estimation. Topics include basic probability distributions (e.g. normal, binomial), expected value, estimation (maximum likelihood, confidence intervals), hypothesis testing, OLS regression, maximum likelihood estimation, and expectation maximization algorithm.
Course learning outcomes	CLO 1. Describe similarities and differences between data collection techniques, such as simple random samples, stratified or cluster samples, completely randomized experiments, matched-pairs or block designs. Summarize data using appropriate graphical and numerical techniques, including using common probability distributions as models for datasets. Understand the importance of the integrity and quality of data.

	<p>CLO 2. Calculate expected values, variances, and probabilities for common probability distributions (e.g. normal, binomial). Basic of probability sampling and generating distribution via algorithms and implementation from scratch. Get familiar with Python for probability and statistics.</p> <p>CLO 3. Understand the fundamentals of Central dispersion measure, Law of large number and Central limit theorem. Make inference about a population using an appropriate hypothesis test, confidence interval, or regression model.</p> <p>CLO 4. Estimate a population parameter by finding the maximum likelihood estimator, expectation maximization algorithm or calculating the appropriate confidence interval. Fit, interpret, and assess regression models with ordinary least square approach.</p>																								
	<table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr> <tr> <td>Skill</td><td>CLO 2, CLO 4</td></tr> <tr> <td>Attitude</td><td>CLO 1</td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO 1, CLO 2, CLO 3, CLO 4	Skill	CLO 2, CLO 4	Attitude	CLO 1																
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Attitude	CLO 1																								
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>																								
	<table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Data concepts, collection Introduction colab, python Data integrity and quality</td><td>1</td><td>I, U</td></tr> <tr> <td>Basic of probability sampling and generating distribution via algorithms and implementation from scratch. Get familiar with Python for probability and statistics.</td><td>2</td><td>T, U</td></tr> <tr> <td>Distribution, including discrete vs. continuous random variables, expectation, variance, Binomial, Poisson, Normal, joint distributions, sampling distribution of the mean</td><td>2</td><td>T, U</td></tr> <tr> <td>Introduction to advanced python and related libraries in probability and statistics</td><td>1</td><td>T, U</td></tr> <tr> <td>Central dispersion measure, Law of large number and Central limit theorem</td><td>1</td><td>T, U</td></tr> <tr> <td>Estimation via maximum likelihood</td><td>2</td><td>T, U</td></tr> <tr> <td>Confidence intervals for means</td><td>1</td><td>T, U</td></tr> </tbody> </table>	Topic	Weight	Level	Data concepts, collection Introduction colab, python Data integrity and quality	1	I, U	Basic of probability sampling and generating distribution via algorithms and implementation from scratch. Get familiar with Python for probability and statistics.	2	T, U	Distribution, including discrete vs. continuous random variables, expectation, variance, Binomial, Poisson, Normal, joint distributions, sampling distribution of the mean	2	T, U	Introduction to advanced python and related libraries in probability and statistics	1	T, U	Central dispersion measure, Law of large number and Central limit theorem	1	T, U	Estimation via maximum likelihood	2	T, U	Confidence intervals for means	1	T, U
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Introduction to advanced python and related libraries in probability and statistics	1	T, U																							
Central dispersion measure, Law of large number and Central limit theorem	1	T, U																							
Estimation via maximum likelihood	2	T, U																							
Confidence intervals for means	1	T, U																							

	Hypothesis tests for means	1	T, U
	Expectation maximization algorithm	1	I, T
	Introduction to regression with ordinary least square. Model fitting and diagnostics	2	T, U
Examination forms	Short-answer questions, Long-answer questions, programming questions		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>		
Reading list	<ol style="list-style-type: none"> <li>1. Ronald E. Walpole, Probability &amp; Statistics for Engineers &amp; Scientists 9th, 2013</li> <li>2. github: Python for Probability Statistics and Machine Learning 2E.</li> <li>3. R. Lyman Ott and Michael T. Longnecker, An Introduction to Statistical Methods and Data Analysis 7th, 2015</li> </ol>		

## 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:

	SL O					
CL O	1	2	3	4	5	6
1	x	x				
2	x	x				
3	x	x				x
4	x	x				x

## 3. Planned learning activities and teaching methods

Wee k	Topic	CLO	Assessmen ts	Learning activities	Resource s
1	Data concepts, collection Introduction colab, python Data integrity and quality What is Probability/Statistics	1		Lecture, Discussion	[1, 2]. Chapter 1
2-3	Basic of probability sampling and generating distribution via algorithms and implementation from scratch. Get familiar with	1, 2	Exercises	Lecture, In-class exercises	[2]. Chapter 2

	Python for probability and statistics.				[1]. Chapter 2, 3, 4
4-5	Distribution, including discrete vs. continuous random variables, expectation, variance, Binomial, Poisson, Normal, joint distributions, sampling distribution of the mean	1, 2	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 3, 4, 5
6	Introduction to advanced python and related libraries in probability and statistics	1, 2		Lecture, In-class Discussion	[2]. Chapter 2, 3, 4, 5
7	Central dispersion measure, Law of large number and Central limit theorem	2, 3	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 5, 6, 7
8	<b>Midterm</b>				
9-10	Estimation via maximum likelihood	2, 3, 4	Exercises	Lecture, In-class exercises	[1, 2]. Chapter 8, 9
11	Confidence intervals for means	3	Exercises	Lecture, In-class exercises	[1, 2]. Chapter 8, 9
12	Hypothesis tests for means	3	Exercises	Lecture, In-class exercises	[1, 2]. Chapter 8, 9, 10
13	Expectation maximization algorithm	2, 3, 4	Quiz	Lecture, In-class Quiz	[2]. Chapter 10. 11
14-15	Introduction to regression with ordinary least square. Model fitting and diagnostics	3, 4	Exercises	Lecture, In-class exercises	[1, 2]. Chapter 11, 12, 13
16	Revision			Review-test	
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
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.*

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

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

### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.

1	Demonstrates no understanding of the problem.
0	No response/task not attempted

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

### 5.3. Analytic rubric

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

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

Source: Association of American Colleges and Universities

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

	Capstone	Milestone	Benchmark
	4	3	2

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

Source: Association of American Colleges and Universities

**Date revised: February 15, 2022**

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



**Nguyen Van Sinh**

**Course Name: Probability, Statistic & Random Process****Course Code: MA026IU**

Course designation	This course introduces fundamental mathematical methods and analysis in ordinary differential equations and their applications and a short introduction to partial differential equations.
Semester(s) in which the course is taught	1, 2
Person responsible for the course	
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 hours: 60
Credit points	4
Required and recommended prerequisites for joining the course	None
Course objectives	<ol style="list-style-type: none"> <li>1. This course introduces the theory of ordinary differential equations. Topics discussed include first-order differential equations, existence and uniqueness theorems, second-order linear equations, higher-order linear equations, systems of equations, non-linear equations.</li> <li>2. The relationship between differential equations and linear algebra is emphasized in this course.</li> <li>3. Applications of differential equations in physics, engineering, biology, and economics are presented.</li> <li>4. This course also gives a very brief introduction to partial differential equations in particular using separation variables to solve heat equation, wave equation, and Laplace equation.</li> </ol>

Course learning outcomes	<p>Upon the successful completion of this course students will be able to:</p> <p><b>Competency Course learning outcome (CLO) level</b></p> <p>Knowledge CLO1. Understand the concepts of differential equations and the methods to solve linear first/second differential equations. (Program outcomes: a)</p> <p>CLO2. Understand the method to solve linear <math>n</math>-th order differential equations. Know how to use separation of variable to solve the heat equation, wave equation and Laplace equation (Program outcomes: a)</p> <p>Skill CLO3. Can solve basic first order differential equations, higher order differential equations with constant coefficients and first order systems. (Program outcomes: a, j)</p> <p>CLO4. Can use partial differential equations to model and study real phenomena (Program outcomes: a, j)</p> <p>Attitude CLO5. Confident when applying differential equations to practical situations. (Program outcome: j, k)</p>												
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (4 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td><b>Introduction</b> Some Basic Mathematical Models; Direction Fields Solutions of Differential Equations Classification of Differential Equations</td><td>1</td><td>I, T</td></tr> <tr> <td><b>First-order differential equations</b> Linear Equations Method of Integrating Factors Separable Equations Modeling with First Order Equations</td><td>1</td><td>T, U</td></tr> <tr> <td>Differences Between Linear and Nonlinear Equations Autonomous Equations and Population Dynamics Exact Equations and Integrating Factors</td><td>1</td><td>T, U</td></tr> </tbody> </table>	Topic	Weight	Level	<b>Introduction</b> Some Basic Mathematical Models; Direction Fields Solutions of Differential Equations Classification of Differential Equations	1	I, T	<b>First-order differential equations</b> Linear Equations Method of Integrating Factors Separable Equations Modeling with First Order Equations	1	T, U	Differences Between Linear and Nonlinear Equations Autonomous Equations and Population Dynamics Exact Equations and Integrating Factors	1	T, U
Topic	Weight	Level											
<b>Introduction</b> Some Basic Mathematical Models; Direction Fields Solutions of Differential Equations Classification of Differential Equations	1	I, T											
<b>First-order differential equations</b> Linear Equations Method of Integrating Factors Separable Equations Modeling with First Order Equations	1	T, U											
Differences Between Linear and Nonlinear Equations Autonomous Equations and Population Dynamics Exact Equations and Integrating Factors	1	T, U											

	<b>Linear second-order differential equations</b> Fundamental solution set of homogeneous equations Linear independence and Wronskian Homogeneous linear second-order differential equations with constant coefficients	<b>2</b>	<b>T, U</b>
	Non-homogeneous equations Method of undermined coefficients Variation of Parameters Mechanical and Electrical Vibrations Forced Vibrations	<b>2</b>	<b>T, U</b>

	<b>Topic</b>	<b>Weight</b>	<b>Level</b>
	<b>Higher Order Linear Equations</b> General Theory of nth Order Linear Equations Homogeneous Equations with Constant Coefficients Method of Undetermined Coefficients Variation of Parameters	<b>2</b>	<b>T, U</b>
	Basic Theory of Systems of First Order Linear Equations Homogeneous Linear Systems with Constant Coefficients	<b>2</b>	<b>T, U</b>
	Non-homogeneous systems: Method of undetermined coefficients Variation of parameters	<b>2</b>	<b>T, U</b>
	<b>Partial differential equations</b> Separation of variables Heat conduction in a bar Wave equation, Laplace equation	<b>2</b>	
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	<ol style="list-style-type: none"><li>1. W.E. Boyce, R.C. DiPrima, Elementary Differential Equations and Boundary Value problems, 8<sup>th</sup> Edition, John Wiley &amp; Sons.</li><li>2. P. Hartman, Ordinary differential equations, SIAM Classics in applied mathematics 38, 2<sup>nd</sup> edition, Birkhauser, 1982</li><li>3. J.K. Hale, Ordinary differential equations, 2nd ed., Robert E. Krieger Publishing Co., Inc., Huntington, New York, 1980.</li></ol>

**1. Date revised: January 12, 2022**

**Course Name: Speaking AE2**  
**Course Code: EN012IU**

**1. General information**

Course designation	<i>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).</i>
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 <sup>5</sup> : 60
Credit points	2
Required and recommended prerequisites for joining the course	Students must complete AE1 courses
Course objectives	Speaking AE2 aims at introducing 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.

<sup>5</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

Course learning outcomes	Upon the successful completion of this course, students will be able to:	
Competency level	Course learning outcome (CLO)	
Knowledge	CLO1. Understand 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	
Skill	CLO2. Prepare and deliver effective, formal, structured presentations that are appropriate to the specific environment and audience.	
Attitude	CLO3. Deliver both informative and persuasive speech with confidence	

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (2 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>		
	<b>Topic</b>	<b>Weigh t</b>	<b>Leve l</b>
	Orientation & Introduction	2	I, T, U
	Needs analysis		
	Building up confidence	2	T, U
	The first few minutes	2	T, U
	Organizing what you want to say	2	T, U
	Summarizing and concluding	2	T, U
	Using equipment	2	T, U
	Delivery techniques: Putting it all together	2	T, U
	Group presentations for the instructor's evaluation and advice	2	U
	Introduction to persuasive speeches	2	T, U
	Methods of persuasion	2	T, U
	Maintaining interest	2	T, U
	Dealing with problems and questions	2	T, U
	Body language	2	T, U
	Individual presentations for the instructor's evaluation and advice	4	U
Examination forms	Oral Presentations		

<p><b>Study and examination requirements</b></p>	<p><i>Attendance</i></p> <p>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.</p> <p><i>Missed Tests</i></p> <p>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.</p> <p><i>Class Behaviors</i></p> <p>Students are required to treat their studying in college as a full-time job and spend an adequate amount 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:</p> <ul style="list-style-type: none"> <li>• Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request.</li> <li>• Participate fully and constructively in all course activities and discussions (if any).</li> <li>• Display appropriate courtesy to all involved in the class.</li> <li>• Provide constructive feedback to faculty members regarding their performance.</li> </ul> <p><i>Plagiarism</i></p> <p>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.</p>
<p><b>Reading list</b></p>	<p>[1] Lowe, S, &amp; Pile, L. (2010). <i>Presenting</i>. Singapore: Cengage Learning</p> <p>[2] Comfort, J. (1997). <i>Effective presentations</i>. Oxford: Oxford University Press</p> <p>[3] Lucas, S. (2014). <i>The art of public speaking</i> (12<sup>th</sup> edition). New York: McGraw-Hill Education.</p> <p>[4] Harrington, D., &amp; Lebeau, C. (2009). <i>Speaking of speech</i>. Macmillan</p>

## 2. Learning Outcomes Matrix (optional)

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

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

## 3. Planned learning activities and teaching methods

WEEK	Content	MATERIAL(S) COVERED	ACTIVITIES
WEEK 1	<ul style="list-style-type: none"> <li>· Orientation &amp; Introduction</li> <li>· Needs analysis</li> </ul>	[1] <i>Presenting</i> , p. 5	<p>Students will:</p> <ul style="list-style-type: none"> <li>• receive an introduction to effective presentation</li> <li>• think about their strength and weaknesses in presenting in English</li> <li>• identify and prioritize their immediate and future needs for presenting</li> <li>• share tips on improving weaknesses</li> </ul>
WEEK 2	<b>Building up confidence</b>		<p>Student will:</p> <ul style="list-style-type: none"> <li>- give a short speech about themselves to help them overcome initial shyness of standing up and speaking in public</li> </ul>
WEEK 3	<b>Unit 1: The first few minutes</b>	<ul style="list-style-type: none"> <li>• <i>Presenting</i>, pp. 8-13</li> <li>• <i>Effective Presentations</i>: p.7 + video clip; p.13+ video clip</li> </ul>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• learn the importance of making a good first impression</li> <li>• learn useful phrases for greeting the audience, introducing themselves and others, and giving the purpose of their presentation</li> </ul>

<b>WEEK 4</b>	<b>Unit 3: Organizing what you want to say</b>	<ul style="list-style-type: none"> <li>• <i>Presenting</i>, pp. 22-27)</li> <li>• <i>Effective Presentations</i>: p.19 +video clip</li> </ul>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• look at the importance of structuring their presentation</li> <li>• learn the useful phrases for outlining their presentation, organizing ideas and moving between different sections of their presentation</li> </ul>
<b>WEEK 5</b>	<b>Unit 6: Summarizing and concluding</b>	<ul style="list-style-type: none"> <li>• <i>Presenting</i>, pp. 40-45</li> <li>• <i>Effective Presentations</i>: p.41 +video clip</li> </ul>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• look at ways of finishing a presentation effectively</li> <li>• learn useful phrases for ending their presentation, summarizing, handing over and thanking</li> </ul>
<b>WEEK 6</b>	<b>Unit 2: Using equipment</b>	<ul style="list-style-type: none"> <li>• <i>Presenting</i>, pp. 14-21)</li> <li>• <i>Effective Presentations</i>: p.31 +video clip</li> </ul>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• use equipment and visuals to support their presentation</li> <li>• learn useful phrases for referring to visuals, ensuring their audience can see and expand on notes</li> </ul>
<b>WEEK 7</b>	<b>Delivery techniques : Putting it all together</b>	<p>[2] <i>Effective Presentations</i>: p.50 + video clip</p> <p>Assignment: Topic(s) for group presentation)</p>	<p>Students will:</p> <ul style="list-style-type: none"> <li>• watch a model presentation and discuss do's and don'ts for effective delivery</li> <li>• pick group members and plan their presentations for Week 8</li> </ul>
<b>WEEK 8</b>	Group presentations for the instructor's evaluation and advice		<p>Students will:</p> <ul style="list-style-type: none"> <li>• take turn to deliver a presentation on the topic(s) assigned by the instructor</li> <li>• consult the instructor for advice on the mid-term exam preparation</li> </ul>
<b>MIDTERM EXAMINATION</b>			
Students will give a five-to-six minute informative presentation on a topic to be			

			determined.
<b>WEEK 9</b>	<b>Introduction to persuasive speeches</b>	[3] <i>The art of public speaking</i> , Chapter 15 (Handout given by the instructor)	Students will: <ul style="list-style-type: none"><li>• know types of persuasive speeches</li><li>• know typical organizations of apersuasive speech</li></ul>
<b>WEEK 10</b>	<b>Methods of persuasion</b>	[3] <i>The art of public speaking</i> , Chapter 16 (Handout given by the instructor)	Students will learn to persuade the audience by: <ul style="list-style-type: none"><li>• building credibility</li><li>• using evidence</li><li>• reasoning</li><li>• appealing to emotions</li></ul>
<b>WEEK 11</b>	<b>Unit 4: Maintaining interest</b>	<ul style="list-style-type: none"><li>• <i>Presenting</i>: pp. 28-33)</li><li>• <i>Effective Presentations</i>: p.25 +video clip)</li></ul>	Students will: <ul style="list-style-type: none"><li>• look at maintaining interestthrough effective delivery</li><li>• learn useful phrases for clarifyingwhat you mean, checking if the audience is following and involving the audience</li></ul>
<b>WEEK 12</b>	<b>Unit 5: Dealing with problems and questions</b>	<ul style="list-style-type: none"><li>○ <i>Presenting</i>: pp. 34-39)</li><li>○ <i>Effective Presentations</i>: p.44(Question time)</li></ul>	Students will: <ul style="list-style-type: none"><li>• learn strategies for coping inunexpected situations</li><li>• learn useful phrases for dealingwith problems and questions</li></ul>
<b>WEEK 13</b>	<b>Unit 6: Body language</b>	[2] <i>Effective Presentations</i> : pp.36-39	Students will: <ul style="list-style-type: none"><li>• practise using language and bodylanguage to communicate the message clearly and persuasively</li><li>• watch video clips about bodylanguage</li><li>• learn how to control posture, eye contact, gestures and voice inflection</li></ul>

<b>WEEK 14</b>	<b>Practice</b>	(to be determined by the instructor)	Students will: - deliver individual or group presentations (assigned by the instructor)
<b>WEEK 15</b>	<b>Wrap-up and advice</b>	(to be determined by the instructor)	Students will: • consult the instructor for advice on the final exam preparation • continue to deliver individual or group presentations (if any)
<b>FINAL EXAMINATION</b> Students will deliver a seven-to-eight-minute persuasive presentation on a topic to be determined			

#### 4. Assessment plan

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

	<b>Very Poor</b>	<b>Poor</b>	<b>Average</b>	<b>Good</b>	<b>Excellent</b>
<b>Pronunciation, Voice Techniques (Pauses, Volume, Speed Change, Stress, Tone, Etc)</b>	<ul style="list-style-type: none"> <li>- Mumbles, often mispronounces, very difficult to understand.</li> <li>- Dead person talking, voice to text software does better</li> </ul>	<ul style="list-style-type: none"> <li>- Slurred speech, mispronounces some words. Difficult to understand.</li> <li>- Quiet, monotone, sing/song, little or no expression, boring.</li> </ul>	<ul style="list-style-type: none"> <li>- Clear voice, few pronunciation errors. Some slurring. Most can understand the presentation</li> <li>- Some use of voice to show interest</li> </ul>	<ul style="list-style-type: none"> <li>- Crisp, clear voice, correct, precise pronunciation, all can understand.</li> <li>- proper volume; steady rate; enthusiasm; confidence</li> </ul>	<ul style="list-style-type: none"> <li>- Native like</li> </ul>
<b>Grammar &amp; Vocabulary (Usage And Appropriateness For Audience)</b>	<ul style="list-style-type: none"> <li>- Frequent grammar or spelling errors</li> <li>- Inappropriate level. for the audience, Misuse vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>- Noticeable Errors</li> <li>- Often too simple or sophisticated, inconsistent. Some vocabulary incorrectly used</li> </ul>	<ul style="list-style-type: none"> <li>- Minor errors</li> <li>- Generally appropriate, little variation or creativity</li> </ul>	<ul style="list-style-type: none"> <li>- No errors, but simple language</li> <li>- Always appropriate for the audience. Excellent use of vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>- No errors. Excellent use of grammar to support ideas</li> <li>- Creative use of language</li> </ul>
<b>Body Language, Gestures, Eye Contact (Turns back to audience and reads screen – 0)</b>	<ul style="list-style-type: none"> <li>- Dead person on stage</li> <li>- Almost no eye contact, reads notes/screen</li> </ul>	<ul style="list-style-type: none"> <li>- Excessive movement or many distracting gestures</li> <li>- Occasionally eye contact, mostly reads notes/screen</li> </ul>	<ul style="list-style-type: none"> <li>- Some distracting gestures, and some movement and useful gestures</li> <li>- Generally maintains eye contact frequently reads notes/screen</li> </ul>	<ul style="list-style-type: none"> <li>- No distracting gestures. Body language supports speech</li> <li>- Excellent eye contact, seldom uses notes</li> </ul>	<ul style="list-style-type: none"> <li>- Excellent use of body language</li> <li>- Constant eye contact, no use of notes</li> </ul>
<b>Organization: Intro, Main, Ending, Coherence (see RATING CHECKLIST)</b>	<ul style="list-style-type: none"> <li>- Difficult to follow as disorganized</li> </ul>	<ul style="list-style-type: none"> <li>- Generally follows outline, poor introduction or conclusion.</li> </ul>	<ul style="list-style-type: none"> <li>- Follows outline, material generally well organized. Some use of transitions and linkage of ideas. Conclusion acceptable</li> </ul>	<ul style="list-style-type: none"> <li>- Follows outline, material well organized.</li> <li>- Ideas clearly linked. Some use of transitions</li> </ul>	<ul style="list-style-type: none"> <li>- Excellent, clear linkage of ideas.</li> <li>- Good transitions Arouses interest in Introduction, and summarizes clearly main points in conclusion</li> </ul>
<b>Content: Relevant/ Interesting/ Accurate</b>	<ul style="list-style-type: none"> <li>- Several errors or lacks critical information</li> </ul>	<ul style="list-style-type: none"> <li>- Some errors and has irrelevant information</li> </ul>	<ul style="list-style-type: none"> <li>- Information is generally accurate, minor errors, generally meets needs of the audience</li> </ul>	<ul style="list-style-type: none"> <li>- Accurate information, related to needs of audience</li> </ul>	<ul style="list-style-type: none"> <li>- No errors, answers all needs of the audience</li> </ul>
<b>Visual Aids: Appropriate, Clear (Movies, sound – 0)</b>	<ul style="list-style-type: none"> <li>- Slides consist of full paragraphs of text, no or superfluous graphics</li> <li>- Tiny font</li> </ul>	<ul style="list-style-type: none"> <li>- Slides have full sentences and occasional superfluous graphics, Difficult to read</li> </ul>	<ul style="list-style-type: none"> <li>- Slides have short phrases, Graphics relate to text and presentation. Easily read</li> </ul>	<ul style="list-style-type: none"> <li>- Attractive, informative graphics, only key words, easily understood, Good use of masking</li> </ul>	<ul style="list-style-type: none"> <li>- Professional quality, Excellent use of visual, no unrelated graphics, easily read, supports presentation</li> </ul>
<b>Overall effectiveness</b>	<ul style="list-style-type: none"> <li>- Ineffective, alienated audience</li> </ul>	<ul style="list-style-type: none"> <li>- Little positive effect or exchange of info.. Audience bored</li> </ul>	<ul style="list-style-type: none"> <li>- Audience learned something, no change in attitude</li> </ul>	<ul style="list-style-type: none"> <li>- Audience generally positive and learned from presentation</li> </ul>	<ul style="list-style-type: none"> <li>- Audience was kept interested and would remember key points</li> </ul>

ACADEMIC YEAR 2021 - 2022  
DATE: \_\_\_\_\_Student name : \_\_\_\_\_ Student ID : \_\_\_\_\_  
Topic : \_\_\_\_\_

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

Negative points: ♦ Timing: &lt;3m: -15pts 3m - 3m29: -10pts 3m30 - 3m59: -5pts 4m - 6m: OK &gt;6m: -5pts

**Organization:**

## A. Introduction

- 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 (*Transitions: 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*)
- c. Closing (*Thank you very much for your attention*)
- d. Inviting questions (*I'd be glad to answer any questions you might have*)

**Yes****No**

Examiner : .....

## 7. Final exam rubrics and marksheets

	<b>Very Poor</b>	<b>Poor</b>	<b>Average</b>	<b>Good</b>	<b>Excellent</b>
<b>Pronunciation, Voice Techniques (Pauses, Volume, Speed Change, Stress, Tone, etc.)</b>	<ul style="list-style-type: none"> <li>- Mumbles, often mispronounces, very difficult to understand.</li> <li>- Dead person talking, voice to text software does better</li> </ul>	<ul style="list-style-type: none"> <li>- Slurred speech mispronounces some words. Difficult to understand.</li> <li>- Quiet, monotone, sing/song, little or no expression, boring.</li> </ul>	<ul style="list-style-type: none"> <li>- Clear voice, few pronunciation errors. Some slurring. Most can understand the presentation</li> <li>- Some use of voice to show interest</li> </ul>	<ul style="list-style-type: none"> <li>- Crisp, clear voice, correct, precise pronunciation, all can understand.</li> <li>- Proper volume; steady rate; enthusiasm; confidence</li> </ul>	<ul style="list-style-type: none"> <li>- Native like</li> </ul>
<b>Grammar &amp; Vocabulary (Usage and Appropriateness for Audience)</b>	<ul style="list-style-type: none"> <li>- Frequent grammar or spelling errors</li> <li>- Inappropriate level, for the audience, Misuse vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>- Noticeable Errors</li> <li>- Often too simple or sophisticated, inconsistent. Some vocabulary incorrectly used</li> </ul>	<ul style="list-style-type: none"> <li>- Minor errors</li> <li>- Generally appropriate, little variation or creativity</li> </ul>	<ul style="list-style-type: none"> <li>- No errors, but simple language</li> <li>- Always appropriate for the audience. Excellent use of vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>- No errors. Excellent use of grammar to support ideas</li> <li>- Creative use of language</li> </ul>
<b>Body Language: Posture, Gestures, Eye contact, Facial expression (Turns back to audience and reads screen – 0)</b>	<ul style="list-style-type: none"> <li>- Dead person on stage</li> <li>- Almost no eye contact, reads notes/screen</li> </ul>	<ul style="list-style-type: none"> <li>- Excessive movement or many distracting gestures</li> <li>- Occasionally eye contact, mostly reads notes/screen</li> </ul>	<ul style="list-style-type: none"> <li>- Some distracting gestures, and some movement and useful gestures</li> <li>- Generally maintains eye contact frequently reads notes/screen</li> </ul>	<ul style="list-style-type: none"> <li>- No distracting gestures. Body language supports speech</li> <li>- Excellent eye contact, seldom uses notes</li> </ul>	<ul style="list-style-type: none"> <li>- Excellent use of body language</li> <li>- Constant eye contact, no use of notes</li> </ul>
<b>Organization: Intro, Main, Ending, Coherence (see RATING CHECKLIST)</b>	<ul style="list-style-type: none"> <li>- Difficult to follow as disorganized</li> </ul>	<ul style="list-style-type: none"> <li>- Generally follows outline, poor introduction or conclusion.</li> </ul>	<ul style="list-style-type: none"> <li>- Follows outline, material generally well organized. Some use of transitions and linkage of ideas.</li> <li>- Conclusion acceptable</li> </ul>	<ul style="list-style-type: none"> <li>- Follows outline, material well organized.</li> <li>- Ideas clearly linked. Some use of transitions</li> </ul>	<ul style="list-style-type: none"> <li>- Excellent, clear linkage of ideas.</li> <li>- Good transitions Arouses interest in Introduction, and summarizes clearly main points in conclusion</li> </ul>
<b>Content: Relevant/Accurate, Informative and Persuasive</b>	<ul style="list-style-type: none"> <li>- Several errors or lacks critical information</li> <li>- Just focus on giving information</li> </ul>	<ul style="list-style-type: none"> <li>- Some errors and has irrelevant information</li> <li>- Give reasons with little or no emphasis on persuasion</li> </ul>	<ul style="list-style-type: none"> <li>- Information is generally accurate, minor errors</li> <li>- Give frequent emphasis on persuasion</li> </ul>	<ul style="list-style-type: none"> <li>- Accurate information, related to needs of audience</li> <li>- Give frequent emphasis on persuasion</li> </ul>	<ul style="list-style-type: none"> <li>- No errors, answers all needs of the audience</li> <li>- Persuade the audience well</li> </ul>
<b>Visual Aids: Appropriateness, Clarity (Use of video clip exceeding 20 seconds – 0)</b>	<ul style="list-style-type: none"> <li>- Slides consist of full paragraphs of text, no or superfluous graphics</li> <li>- Tiny font</li> </ul>	<ul style="list-style-type: none"> <li>- Slides have full sentences and occasional superfluous graphics,</li> <li>- Difficult to read</li> </ul>	<ul style="list-style-type: none"> <li>- Slides have short phrases; Graphics relate to text and presentation. Easily read</li> </ul>	<ul style="list-style-type: none"> <li>- Attractive, informative graphics, only key words, easily understood, good use of masking</li> </ul>	<ul style="list-style-type: none"> <li>- Professional quality, Excellent use of visual, no unrelated graphics, easily read, supports presentation</li> </ul>
<b>Question response</b>	<ul style="list-style-type: none"> <li>- Welcomes the question</li> </ul>	<ul style="list-style-type: none"> <li>- Listens carefully, doesn't interrupt</li> </ul>	<ul style="list-style-type: none"> <li>- Thinks before answering</li> <li>- Clarifies, rephrases as needed</li> </ul>	<ul style="list-style-type: none"> <li>- Answers correctly and briefly</li> </ul>	<ul style="list-style-type: none"> <li>- Checks to see if questioner is satisfied</li> </ul>

ACADEMIC YEAR 2021 – 2022  
DATE: \_\_\_\_\_

 Student name : ..... Student ID : .....  
 Topic : .....

Wtg.	Criteria	Very poor	Poor	Average	Good	Excellent	Comments
15	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)	
<b>SCORE (max.100):</b> _____		<b>BONUS (max.10):</b> _____		<b>TOTAL SCORE (max.100):</b> _____			

Deduction points: ▵ No references: -10 ▵ Timing: &lt;5m: -15pts 5m - 5m29: -10pts 5m30 - 5m59: -5pts &gt;8m: -5pts

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

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

Examiner : \_\_\_\_\_

**Date revised: 15 August, 2022**

**Course Name: Writing AE2****Course Code: EN011IU****1. General information**

Course designation	<i>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.</i>
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 outcomes	<p>Upon the successful completion of this course, students will be able to:</p> <table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td><b>Knowledge</b></td><td><b>CLO1. Understand the structure of a research paper and employ appropriate academic language in writing a research paper</b></td></tr> <tr> <td><b>Skill</b></td><td><b>CLO2. Read critically, analyze, and annotate academic articles and journals</b> <b>CLO3. Employ the research writing skills obtained to work on their own paper in their major study.</b></td></tr> <tr> <td><b>Attitude</b></td><td><b>CLO4. Reason around ethical issues in writing research paper and avoid committing plagiarism</b></td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	<b>Knowledge</b>	<b>CLO1. Understand the structure of a research paper and employ appropriate academic language in writing a research paper</b>	<b>Skill</b>	<b>CLO2. Read critically, analyze, and annotate academic articles and journals</b> <b>CLO3. Employ the research writing skills obtained to work on their own paper in their major study.</b>	<b>Attitude</b>	<b>CLO4. Reason around ethical issues in writing research paper and avoid committing plagiarism</b>																												
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Examination forms	Essay writing																																				

Study and examination requirements	<p><i>Attendance</i></p> <p>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.</p> <p><i>Assignment (Literature review)</i></p> <p>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.</p> <p>Task:</p> <ul style="list-style-type: none"> <li>• Follow guidelines on how to write a literature review.</li> <li>• Use relevant academic writing skills such as paraphrasing, summarising, developing arguments, and APA 7th Style Guidelines – see <a href="https://www.apastyle.org/">https://www.apastyle.org/</a></li> <li>• Develop arguments in relation to the research scope and identify the research gap</li> </ul> <p><b>Notes:</b> 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.</p> <p><i>Missed Tests</i></p> <p>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.</p> <p><i>Class Behaviors</i></p> <p>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:</p> <ul style="list-style-type: none"> <li>• Prepare thoroughly for each class in accordance with the course syllabus and complete home assignments as the instructor's request.</li> <li>• Participate fully and constructively in all course activities and discussions (if any).</li> <li>• Display appropriate courtesy to all involved in the class.</li> <li>• Provide constructive feedback to faculty members regarding their performance.</li> </ul> <p><i>Plagiarism</i></p> <p>All forms of plagiarism and unauthorised collusion are seriously regarded and could result in penalties.</p> <p>Plagiarism occurs when students copy or reproduce people's words or ideas and then present them as students' own work</p>
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	<p>without proper acknowledgement, including when students copy the work of their fellow students.</p> <p>Plagiarism in student submissions can be detected by:</p> <ul style="list-style-type: none"> <li>• some web-based programs such as SafeAssign or Turnitin, or</li> <li>• examiner's judgments with evidence of originals</li> </ul> <p>The rater will review the paper to check if citations or references are provided properly. Penalties due to improper citations or references include:</p> <table border="1"> <thead> <tr> <th>Degree of magnitude</th><th>Description</th></tr> </thead> <tbody> <tr> <td>Below 15%</td><td>Marked as it is.</td></tr> <tr> <td>15% - 25%</td><td>The score is deducted by <b>25%</b>.</td></tr> <tr> <td>25% - 40%</td><td>The score is deducted by <b>50%</b></td></tr> <tr> <td>Over 40%</td><td>The score is <b>0</b>.</td></tr> </tbody> </table> <p>Notes: Part of the test is marked as it is if no plagiarism is detected. Students who plagiarize over 40% <u>twice</u> will be prohibited from sitting the final examination.</p> <p><i>Writing Center (Room 509)</i></p> <p>Students are encouraged to visit the Writing Center or to schedule an appointment for additional help.</p>	Degree of magnitude	Description	Below 15%	Marked as it is.	15% - 25%	The score is deducted by <b>25%</b> .	25% - 40%	The score is deducted by <b>50%</b>	Over 40%	The score is <b>0</b> .
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25% - 40%	The score is deducted by <b>50%</b>										
Over 40%	The score is <b>0</b> .										
Reading list	<p>[1] Hamp-Lyons, L., &amp; Heasley, B. (2006). <i>Study Writing</i>. Cambridge, UK: Cambridge University Press</p> <p>[2] Articles and Essays taken from <i>The Allyn and Bacon Guide to Writing</i> by Ramage et al (2009), Pearson Longman.</p> <p>[3] Cormack, J. &amp; Slaught, J. (2009). <i>English for academic study: Extended writing and research skills</i>. Cambridge: Cambridge University Press. Garnet Education</p> <p>[4] Folse, K. S. &amp; Pugh, T. (2010). <i>Great writing 5: Greater essays</i>. Boston: Heinle, Cengage Learning.</p> <p>[5] Keezer, S. (Ed.) (2003). <i>Write your research report: A real-time guide</i>. New Jersey: Pearson Learning Group.</p> <p>[6] Kumar, R. (2019). <i>Research methodology: A step-by-step guide for beginners</i>. Sage Publications</p>										

## 2. Learning Outcomes Matrix (optional)

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

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

### 3. Planned learning activities and teaching methods

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

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

#### 4. Assessment plan

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

Class participation and Assignments (30%)	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

### 5.1. Midterm exam sample rubrics (100 points)

#### 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) b. reduce stress (when seeing familiar sheep faces)	7.5	
Sub-category 2	2. Cows' co-operative partnerships & physiological response on learning something new 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.	7.5	CLO 1,2
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
<b>Total</b>		<b>30</b>	

#### TASK 2: 70 points

CATEGORIES	CRITERIA	POINTS	CLO
Content	All main points relevant to topic Essay question fully answers	20	CLO 1,3,4

<b>Organization</b>	Topic and purpose of the essay discussed in the introduction Each main point discussed in a paragraph All main points summarized and rephrased in the conclusion	<b>20</b>	CLO 1,3,4
<b>Coherence</b>	Paragraphs ordered in a systematic manner based on, for example, importance, priority, etc. Comparison/contrast transitions are properly used.	<b>15</b>	CLO 1,3,4
<b>Style and Tone</b>	Formal writing with full forms Polite writing Academic vocabulary	<b>15</b>	CLO 1,3,4
<b>Total</b>		<b>70</b>	

## 5.2. Final exam rubrics: 100 points

CATEGORIES	CRITERIA	POINTS	CLO
<b>Content</b>	• Presenting his/her view on the question clearly and persuasively	<b>20</b>	CLO 1,3,4
<b>Structure of ideas</b>	• Introduction with thesis statement, and conclusion with summary and comment • Topic sentences well supported with explanations, examples, etc.	<b>40</b>	CLO 1,3,4
<b>Convincing argumentative techniques, e.g., counterargument</b>		<b>20</b>	CLO 1,3,4
<b>Language use: <i>use vocabulary and grammatical structures</i></b>		<b>20</b>	CLO 1,3,4
<b>Total</b>		<b>100</b>	

Date revised: 15 August, 2022

**Course Name: Object-Oriented Programming****Course Code: IT069IU****1. General information**

Course designation	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 Thanh Tung				
Language	English				
Relation to curriculum	Compulsory (all programs)				
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	Fundamental of Programming				
Course objectives	Introduction to object-oriented programming and design. Topics include core terminologies and basic design principles of object-oriented programming such as classes, objects, abstraction, encapsulation, inheritance, polymorphism, the SOLID design principles, and design patterns				
Course learning outcomes	CLO 1. Explain and use concepts in object-oriented programming including classes, objects, abstraction, encapsulation, inheritance, and polymorphism. CLO 2. Implement an object-oriented solution in JAVA programming language. CLO 3. Analyze design principles and design patterns in object-oriented programming				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">Competency level</th> <th style="text-align: center; padding: 5px;">Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 5px;">Knowledge</td> <td style="text-align: center; padding: 5px;">CLO1</td> </tr> </tbody> </table>		Competency level	Course learning outcome (CLO)	Knowledge	CLO1
Competency level	Course learning outcome (CLO)				
Knowledge	CLO1				

		Skill	CLO2, CLO3																																																		
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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 encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.																																																				
Reading list	<ol style="list-style-type: none"> <li>1. Paul J. Deitel (Author), Harvey Deitel (Author), Java How To Program, 11th Edition, Prentice Hall, 2017</li> <li>2. Matt Weisfeld, The Object-Oriented Thought Process, 3rd Edition, Addison-Wesley, 2009</li> </ol>																																																				

	3. Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides, Design Patterns: Elements of Reusable Object-Oriented Software, Addison-Wesley Professional, 1994 4. Eric Freeman, Bert Bates, Kathy Sierra and Elisabeth Robson, Head First Design Patterns: A Brain-Friendly Guide, O'Reilly Media, 2004
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## 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:

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

## 3. Planned learning activities and teaching methods

Wee k	Topic	CL O	Assessments	Learning activities	Resource s
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,	[1,2]

				In-class exercises	
8	Exception handling	1,2	Quiz	Lecture	[1]
9	<b>Midterm</b>				
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	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
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/Assignment: .....		
Date: .....	Evaluator: .....		
	<b>Max.</b>	<b>Score</b>	<b>Comments</b>
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>			
<b>TOTAL SCORE</b>		100	

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>			<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described	Issue/ problem to be considered critically is stated, described, and	Issue/ problem to be considered critically is stated but	Issue/ problem to be considered critically is stated without	

	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.	clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

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

Source: Association of American Colleges and Universities

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and	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 observable

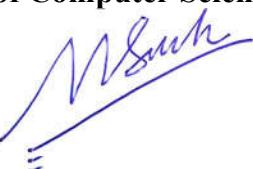
	observable and is skillful and makes the content of the presentation cohesive.	consistently observable within the presentation.	observable within the presentation.	within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally

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

*Source: Association of American Colleges and Universities*

**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: Fundamental Concepts of Data Security****Course Code: IT140IU****1. General information**

1. Course designation	Fundamental concept of data security: This course focuses on information security, integrity and privacy techniques.
Semester(s) in which the course is taught	5,7
Person responsible for the course	Le Thanh Son, MSc.
Language	English
Relation to curriculum	Compulsory
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	
Course objectives	This course introduces students to cryptographic principals and systems (symmetric and public key encryptions), and their applications in data security, secure communications, authentication and authorization. These core principles will be applied to the concepts of information risk management, and the analysis and handling of compromised systems. The ethics around computer crime, privacy, and intellectual property are covered in detail. Finally, the unit will cover the criteria and controls for information classification.
Course learning outcomes	CLO 1. Gain understanding of the cryptography concepts including symmetric key encryption, hash function, message authentication code, public key encryption, digital signature and digital envelope;

	<p>CLO 2. Apply the concepts of authentication and authorization in implementing secure systems and networks;</p> <p>CLO 3. Understand and categorize the malicious software and their attacking mechanisms;</p> <p>CLO 4. Explore the buffer overflow attacks and fuzzing to find software vulnerabilities, and obtain the knowledge of software and operating system security;</p> <p>CLO 5. Understand and practice Internet security protocols and authentication applications;</p>																																				
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Malicious software;	2	T																																			
Database and cloud security;	1	T,U																																			
Examination forms	Multiple-choice questions, short-answer questions																																				
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																				

Reading list	1. William Stallings, Cryptography and Network Security 7th, 2016
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## 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 O	1	2	3	4	5	6
1	X		X	X		
2		X				
3	X					
4	X					
5	X					

## 3. Planned learning activities and teaching methods

Wee k	Topic	CL O	Assessmen ts	Learning activities	Resource s
1	Symmetric-key encipherment (AES, DES)	1	Quiz, exam	Lecture, exercises, lab	[1]
2	Asymmetric-key encipherment (RSA, Diffie-Hellman,...);	1	Quiz, exam	Lecture, exercises, lab	[1]
3	Message integrity and message authentication;	1,2	Quiz, exam	Lecture, exercises, lab	[1]
4	Cryptographic hash function;	1	Quiz, exam	Lecture, exercises, lab	[1]
5	Digital signature;	1	Quiz, exam	Lecture, exercises, lab	[1]
6	<b>Midterm</b>				
7	Entity authentication;	2	Quiz, exam	Lecture, exercises, lab	[1]
8	Security at the application layer: PGP and S/MIME;	5	Quiz, exam	Lecture, exercises	[1]

9	Security at the transport layer: SSL and TLS;	5	Quiz, exam	Lecture, exercises	[1]
10	Security at network layer: IPSec;	5	Quiz, exam	Lecture, exercises	[1]
11	Malicious software;	3,4	Quiz, exam	Lecture, exercises, lab	[1]
12	Database and cloud security;	3,4	Quiz, exam	Lecture, exercises, lab	[1]
13	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Midterm examination (30%)	68%	70%	55%		
Final examination (40%)				74%	67%
Exercises/ Quiz (30%)	32%	30%	45%	26%	33%

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

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- When calculating contact time, each contact hour is counted as a full hour because the organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.↔

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

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

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

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

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

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

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

Source: Association of American Colleges and Universities

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

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

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

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

*Source: Association of American Colleges and Universities*

**Date revised: February 15, 2022**

Ho Chi Minh City, 15/02/2022

**Dean of School of Computer Science and Engineering**



**Nguyen Van Sinh**

**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 1 Fundamentals of Programming
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.

	<p>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.</p> <p>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.</p> <p>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.</p>																					
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	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 Eigenvectors and Eigenvalues, Eigen-decompositions Introduction to some application of linear algebra: PCA, OLS, ...	2	I, T, U
Examination forms	Short-answer questions, Long-answer questions, programming 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	4. R.O. Hill, Elementary Linear Algebra and Its applications, 3rd edition 5. B. Kolman and David R. Hill, Introductory Linear Algebra: An Applied First Course (8th edition, 9th edition) 6. Jim Hefferon, Linear Algebra, 4th edition. 7. 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:

	SL O					
CL O	1	2	3	4	5	6
1	x					
2		x				
3		x	x			
4			x			

### 3. Planned learning activities and teaching methods

Wee k	Topic	CLO	Assessmen ts	Learning activities	Resource s
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 Subspace of $\mathbb{R}^n$ , linear independence, base and dimension in $\mathbb{R}^n$ Python in linear algebra	1, 2	Exercises	Lecture, In-class exercises	[1, 2, 3]. Chapter 4, 5, 6 [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	<b>Midterm</b>				
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	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
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.

- 
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: .....	
Date: .....		Evaluator: .....	
Max.	Score	Comments	
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		

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

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

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

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

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

Source: Association of American Colleges and Universities

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

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

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

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

*Source: Association of American Colleges and Universities*

**Date revised: February 15, 2022**

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



**Nguyen Van Sinh**

**Course Name: Marxist - Leninist Political Economy****Course Code: PE016IU****1. Thông tin chung**

Tên môn học (tiếng Việt)	Kinh tế chính trị Mác-Lênin
Tên môn học (tiếng Anh):	Marxist - Leninist Political Economy
Mã số môn học:	PE016IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	02
Số tiết lý thuyết:	20 (trên lớp)
Số tiết thực hành:	10 (trên lớp)
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 tiêu môn học**

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 bỏ những nội dung không còn phù hợp hoặc những nội dung mang tính kinh viện đối với sinh viên các trường Cao đẳng, Đại học không chuyên lý luận.

2.1. 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 tế - xã hội của đất nước góp phần giúp sinh viên xây dựng trách nhiệm xã hội phù hợp trong vị trí việc làm và cuộc sống sau khi ra trường.

2.2. 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**

Nội dung chương trình gồm 6 chương: Trong đó chương 1 bàn về đối tượng, phương pháp nghiên cứu và chức năng của Kinh tế chính trị Mác - Lênin. Từ chương 2 đến chương 6 trình bày nội dung cốt lõi của Kinh tế chính trị Mác - Lê nin theo mục tiêu của môn học. Cụ thể các vấn đề như: Hàng hóa, thị trường và vai trò của các chủ thể trong nền kinh tế thị trường; Sản xuất giá trị thặng dư trong nền kinh tế thị trường; Cảnh 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 sử các học thuyết kinh tế, Bản tiếng Việt, Nxb Thông 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 tập, tập 3, tập 27, NXB Tiến bộ Maxcova, 1976.
  - + David Begg, Stanley Fisher, Rudiger Dornbusch, Kinh tế học, Nhà xuất bản Giáo dục Hà Nội 1992.
  - + Đảng Cộng sản Việt Nam (2016), Văn kiện Đại hội Đại biểu toàn quốc lần thứ XII, Nxb Chính trị quốc gia, Hà Nội.
  - + Đảng Cộng sản Việt Nam (2016), Báo cáo tổng kết một số vấn đề lý luận - thực tiễn qua ba mươi năm đổi mới (1986 - 2016), NXB Chính trị quốc gia, Hà Nội.
  - + Đảng Cộng sản Việt Nam (2017), Nghị quyết số 11-NQ/TW ngày 03/6/2017 về: “Hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa”
  - + Chỉ thị số 16/CT-TTg (2017) “về việc tăng cường năng lực 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

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
<b>5.1. Kiến thức</b>					
LO.1	ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC - LÊNIN	LO. 1.1 - Năm được sự hình thành và phát triển của Kinh tế chính trị Mác – Lê nin LO. 1.2 - Xác định được đối tượng nghiên cứu của kinh tế chính trị Mác - Lê nin. LO. 1.3 - Hiểu rõ được phương pháp nghiên cứu của kinh tế chính trị	2.1		I3

		Mác - Lênin			
		LO. 1.4 - Hiểu rõ các chức năng của môn học kinh tế chính trị Mác - Lênin.			
LO.2	HÀNG HÓA, THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THẺ THAM GIA THỊ TRƯỜNG.	LO.2.1- Hiểu rõ sản xuất hàng hóa và điều kiện ra đời của sản xuất hàng hóa  LO.2.2 - Hiểu rõ hàng hóa, hai thuộc tính của hàng hóa và mối quan hệ giữa hai thuộc tính  LO.2.3 - Hiểu rõ mối quan hệ giữa tính hai mặt của lao động sản xuất hàng hóa với hai thuộc tính của hàng hóa  LO.2.4 - Hiểu rõ mặt chất và lượng của giá trị hàng hóa và các nhân tố ảnh hưởng đến lượng giá trị hàng hóa  LO.2.5 - Hiểu rõ được nguồn gốc, bản chất và chức năng của tiền tệ.  LO.2.6 - Hiểu rõ về thị trường, vai trò của thị trường, cơ chế thị trường và nền kinh tế thị trường.  LO.2.7 - Hiểu rõ được một số quy luật kinh tế chủ yếu của kinh tế thị trường.  LO.2.8 - Hiểu rõ vai trò của các chủ thể tham gia thị trường.	2.1	T4	
LO.3	GIÁ TRỊ THẶNG DƯ TRONG NỀN KINH	LO.3.1 - Hiểu rõ được tư bản là gì, công thức chung của tư bản và mâu thuẫn công thức chung	2.1	T4	

	TẾ THỊ TRƯỜNG	của tư bản.  LO.3.2 - Hiểu rõ được hàng hóa sức lao động là gì, tại sao nghiên cứu hàng hóa sức lao động giải quyết mâu thuẫn công thức chung của tư bản	2.1		
		LO.3.3 - Hiểu rõ được giá trị thặng dư là gì. Xác định được có mấy phương pháp sản xuất giá trị thặng dư.	2.1 2.3		
		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.	2.3		
		LO.3.5 - Hiểu rõ được các khái niệm: chi phí sản xuất, lợi nhuận, tỷ suất lợi nhuận, lợi nhuận bình quân, lợi nhuận thương nghiệp, các nhân tố ảnh hưởng đến tỷ suất lợi nhuận	2.1		
		LO.3.6 - Hiểu rõ được lợi tức là gì.			
		LO.3.7 - Hiểu rõ được địa tô tư bản chủ nghĩa. Có mấy loại địa tô tư bản chủ nghĩa và giá cả ruộng đất.	2.1 2.3		
LO.4	CẠNH TRANH	LO.4.1 - Hiểu rõ được	2.1		

	VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG	quan hệ giữa cạnh tranh và độc quyền trong nền kinh tế thị trường.  LO.4.2 - Hiểu rõ được nguyên nhân hình thành 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. Lenin  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.  LO.4.6 - Nắm được vai trò lịch sử của chủ nghĩa tư bản.	2.1  2.1  2.1  2.3  2.1		
LO.5	KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM	LO.5.1 - Hiểu rõ được khái niệm kinh tế thị trường định hướng xã hội chủ nghĩa 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.  LO.5.4 - Hiểu rõ thể chế kinh tế thị trường định hướng xã hội chủ nghĩa là	2.1  2.1  2.1	T4	

		gì và sự cần thiết phải hoàn thiện nó.	2.1		
		LO.5.5 - Nắm được những nội dung cơ bản của hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa 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		
		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 gì, khái quát được các cuộc cách mạng đã diễn ra trong lịch sử.	2.1		T4
		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		
		LO.6.4 - Hiểu rõ tính tất yếu khách quan của công nghiệp hóa, hiện đại hóa ở Việt Nam.	2.1		
		LO.6.5 - Nắm được những nội dung của công nghiệp hóa, hiện đại hóa ở Việt Nam.	2.1		
		LO.6.6 - Nắm được công nghiệp hóa, hiện đại hóa ở Việt Nam trong bối cảnh của cuộc cách mạng công nghiệp lần thứ 4.	2.1		
		LO.6.7 - Hiểu rõ được hội nhập kinh tế quốc tế là gì. Vì sao hội nhập kinh tế quốc tế là sự cần thiết khách quan.	2.3		
		LO.6.8 - Nắm được	2.1		

		<p>những nội dung và tác động tích cực và tiêu cực của hội nhập kinh tế quốc tế.</p> <p>LO.6.9 - Nâng được phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế trong phát triển của Việt Nam</p>	2.3		
<b>5.2. Kỹ năng</b>					
L0.7	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	<p>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</p> <p>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</p> <p>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</p>	2.1 2.2 2.4		U4
<b>5.3. Thái độ</b>					
LO.8	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	<p>LO.8.1. Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng, nhân văn của CN Mác - Lê nin</p> <p>LO.8.2. Có ý thức, trách nhiệm cá nhân đối với tập thể, cộng đồng</p> <p>LO.8.3. Có nhận thức về sự cần thiết học tập, nghiên cứu suốt đời và vận dụng nó trong đời sống.</p>	2.1 2.2 2.3		U3

## 6. Kế hoạch giảng dạy theo buổi học

TT (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
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1 (1 tiết)	Giới thiệu về môn học	LO.1, LO.7;	<p><b>Dạy:</b></p> <ul style="list-style-type: none"> <li>- Tự giới thiệu về giảng viên</li> <li>- Giới thiệu đề cương và tài liệu môn học</li> <li>- Hướng dẫn cách thức dạy và học và cách đánh giá.</li> <li>- Giới thiệu nội dung đề tài thuyết trình nhóm GHW)</li> </ul> <p><b>Học ở lớp:</b></p> <ul style="list-style-type: none"> <li>- Chia nhóm (5 sv/nhóm)</li> <li>- Giới thiệu nhóm học tập</li> </ul> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>-Chọn đề tài thuyết trình của nhóm (GHW)</li> </ul> <p>Đọc trước tài liệu chương 1.</p>	
2 (2 tiết)	<p><b>Chương I</b></p> <p><b>ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU VÀ CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC - LÊNIN</b></p>	LO.1; LO.7 LO.8	<p><b>Dạy:</b></p> <p>I. SỰ HÌNH THÀNH VÀ PHÁT TRIỂN CỦA KTCT MÁC - LENIN</p> <ul style="list-style-type: none"> <li>1.Giai đoạn từ cổ đại đến thế kỷ 18</li> <li>2.Giai đoạn từ sau thế kỷ 18 đến nay</li> </ul> <p>II. ĐỐI TƯỢNG, PHƯƠNG PHÁP NGHIÊN CỨU CỦA KINH TẾ CHÍNH TRỊ MÁC - LÊNIN.</p> <ul style="list-style-type: none"> <li>1.Đối tượng nghiên cứu</li> <li>2.Phương pháp nghiên cứu</li> <li>3.Mục đích nghiên cứu</li> </ul> <p>III. CHỨC NĂNG CỦA KINH TẾ CHÍNH TRỊ MÁC - LÊNIN.</p> <ul style="list-style-type: none"> <li>1.Chức năng nhận thức</li> <li>2.Chức năng thực tiễn</li> <li>3.Chức năng tư tưởng</li> <li>4.Chức năng phương pháp luận</li> </ul> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp.</p> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Phác thảo nội dung thuyết trình nhóm GHW</li> <li>- Đọc trước tài liệu chương</li> </ul>	Thi giữa kỳ (Quiz)

			2.	
3 (6 tiết)	<p style="text-align: center;"><b>Chương 2</b></p> <p>HÀNG HÓA, THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THỀ THAM GIA THỊ TRƯỜNG.</p>	<p>LO.2</p> <p>LO.7</p> <p>LO.8</p>	<p><b>Dạy:</b></p> <p>I. LÝ LUẬN CỦA CÁC MÁC VỀ SẢN XUẤT HÀNG HÓA VÀ HÀNG HÓA.</p> <ul style="list-style-type: none"> <li>1.Sản xuất hàng hóa</li> <li>-Khái niệm sản xuất hàng hóa</li> <li>- Điều kiện ra đời của sản xuất hàng hóa.</li> </ul> <p>2.Hàng hóa</p> <ul style="list-style-type: none"> <li>- Khái niệm hàng hóa</li> <li>- Hai thuộc tính của hàng hóa</li> <li>- Lượng giá trị và các nhân tố ảnh hưởng đến lượng giá trị của hàng hóa</li> <li>- Tính hai mặt của lao động sản xuất hàng hóa.</li> </ul> <p>3.Tiền</p> <ul style="list-style-type: none"> <li>- Nguồn gốc và bản chất của tiền</li> <li>- Chức năng của tiền</li> </ul> <p>4.Dịch vụ và một số hàng hóa đặc biệt.</p> <p>II. THỊ TRƯỜNG VÀ VAI TRÒ CỦA CÁC CHỦ THÈM THAM GIA THỊ TRƯỜNG.</p> <ul style="list-style-type: none"> <li>1.Thị trường</li> <li>- Khái niệm về thị trường</li> <li>- Vai trò của thị trường.</li> <li>- Cơ chế thị trường</li> <li>- Nền kinh tế thị trường.</li> </ul> <p>2.Vai trò của các chủ thể tham gia thị trường.</p> <ul style="list-style-type: none"> <li>- Người sản xuất.</li> <li>- Người tiêu dùng.</li> <li>- Các chủ thể trung gian trong thị trường.</li> <li>- Nhà nước.</li> </ul> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoại lớp:</b> Đọc trước</p>	<p>Thi giữa kỳ (Quiz)</p> <p>Thi cuối kỳ (FEX)</p>

			tài liệu chương 3.	
4 (6 tiết)	<b>Chương 3</b> GIÁ TRỊ THẶNG DU TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.3 LO.7 LO.8	<p><b>Dạy:</b></p> <p>I.LÝ LUẬN CỦA CÁC MÁC VỀ GIÁ TRỊ THẶNG DU</p> <p>1.Nguồn gốc của giá trị thặng dư</p> <p>2.Bản chất của giá trị thặng dư</p> <p>3.Các phương pháp sản xuất giá trị thặng dư trong nền kinh tế thị trường tư bản chủ nghĩa.</p> <p>II.TÍCH LŨY TU BẢN</p> <p>-Bản chất của tích lũy</p> <p>-Những nhân tố góp phần làm tăng quy mô tích lũy</p> <p>-Một số hệ quả của tích lũy tư bản</p> <p>III.CÁC HÌNH THỨC BIỂU HIỆN GIÁ TRỊ THẶNG DU TRONG NỀN KINH TẾ THỊ TRƯỜNG</p> <p>1.Lợi nhuận</p> <p>2.Lợi tức</p> <p>3.Địa tô tư bản chủ nghĩa</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Hoàn thiện bài thuyết trình</p> <p>Đọc trước tài liệu chương 4</p>	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)
5 (5 tiết)	<b>Chương 4</b> CANH TRANH VÀ ĐỘC QUYỀN TRONG NỀN KINH TẾ THỊ TRƯỜNG	LO.4 LO.7 LO.8	<p><b>Dạy:</b></p> <p>I. QUAN HỆ GIỮA CẠNH TRANH VÀ ĐỘC QUYỀN TRONG NN KINH TẾ THỊ TRƯỜNG.</p> <p>II. ĐỘC QUYỀN VÀ ĐỘC QUYỀN NHÀ NUỚC TRONG NỀN KINH TẾ THỊ TRƯỜNG.</p> <p>1.Lý luận của V.I. Lenin</p>	Thuyết trình nhóm (GHW)

			<p>về độc quyền trong nền kinh tế thị trường.</p> <ul style="list-style-type: none"> <li>- Nguyên nhân hình thành và tác động của độc quyền.</li> <li>- Những đặc điểm kinh tế cơ bản của độc quyền trong chủ nghĩa tư bản</li> </ul> <p>2. Lý luận của V.I. Lê nin về độc quyền nhà nước trong chủ nghĩa tư bản.</p> <ul style="list-style-type: none"> <li>- Nguyên nhân ra đời và phát triển của độc quyền nhà nước trong chủ nghĩa tư bản.</li> <li>- Bản chất của độc quyền nhà nước trong chủ nghĩa tư bản.</li> <li>- Những biểu hiện chủ yếu của độc quyền nhà nước trong chủ nghĩa tư bản.</li> <li>- Vai trò lịch sử của chủ nghĩa tư bản.</li> <li>- <b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</li> <li><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 5</li> </ul>	Thi cuối kỳ (FEX)
6 (5 tiết)	<p><b>Chương 5</b></p> <p>KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA VÀ CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM</p>	<p>LO.5</p> <p>LO.7</p> <p>LO.8</p>	<p><b>Dạy:</b></p> <p>I. KINH TẾ THỊ TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM</p> <ol style="list-style-type: none"> <li>1. Khái niệm kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam</li> <li>2. Tính tất yếu khách quan của việc phát triển kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam.</li> </ol> <p>Đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam.</p> <p>II. HOÀN THIỆN THÊM KINH TẾ THỊ</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>

			<p><b>TRƯỜNG ĐỊNH HƯỚNG XÃ HỘI CHỦ NGHĨA Ở VIỆT NAM.</b></p> <p>1.Sự cần thiết phải hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam</p> <p>2.Hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam một số khía cạnh chủ yếu.</p> <p><b>III. CÁC QUAN HỆ LỢI ÍCH KINH TẾ Ở VIỆT NAM</b></p> <p>Lợi ích kinh tế và quan hệ lợi ích kinh tế.</p> <p>1.Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích</p> <p>Học ở lớp: Thảo luận và phát biểu trên lớp</p> <p>Học ngoài lớp: Hoàn thiện bài thuyết trình</p>	
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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 thảo luận được tính theo phương pháp tương đối. sv có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa	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
			<b>Tổng cộng</b>	<b>100%</b>		

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

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết được vị trí của Kinh tế chính trị Mác - Lê nin trong hệ thống lịch sử tư tưởng kinh tế và nắm được đối tượng, phương pháp và chức năng của kinh tế chính trị Mác - Lê nin.	Chương 1	Thi 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 thể 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	<p>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 mô tích lũy. Các khái niệm về chi phí sản xuất, lợi nhuận, lợi tức và địa tô tư bản chủ nghĩa</p>	Chương 3	<p>Thảo luận tại lớp (Discussion in Class)</p> <p>Thi cuối kỳ (FEX)</p>	<p>Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp</p> <p>Ngân hàng đề thi của GV</p>
LO.4 LO.7	<p>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 bản của độc quyền theo quan điểm của V.I. Lenin. Lý luận về độc quyền nhà nước trong chủ nghĩa tư bản. Vai trò lịch sử của chủ nghĩa tư bản.</p>	Chương 4	<p>Thảo luận tại lớp (Discussion in Class)</p> <p>Thi cuối kỳ (FEX)</p>	<p>Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp</p> <p>Ngân hàng đề thi của GV</p>
LO.5 LO.7	<p>Hiểu rõ và nắm được những nội dung: kinh tế thị trường định hướng xã hội chủ nghĩa ở Việt Nam, những đặc trưng của kinh tế thị trường định hướng xã hội chủ nghĩa. Thể chế kinh tế thị trường định hướng xã hội chủ nghĩa và sự cần thiết phải hoàn thiện thể chế kinh tế thị trường định hướng xã hội chủ nghĩa. Lợi ích kinh tế và quan hệ lợi ích kinh tế. Vai trò của nhà nước trong đảm bảo hài hòa các quan hệ lợi ích.</p>	Chương 5	<p>Thảo luận tại lớp (Discussion in class)</p> <p>Thi cuối kỳ (FEX)</p>	<p>Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp</p> <p>Ngân hàng đề thi của GV</p>

	<p>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 động của hội nhập kinh tế quốc tế của Việt Nam. Phương hướng nâng cao hiệu quả hội nhập kinh tế quốc tế.</p>	<p>Chương 6</p>	<p>Thảo luận tại lớp (Discussion in class) Thi cuối kỳ (FEX)</p>	<p>Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của GV</p>
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## 9. Một số lưu ý khác

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với giảng viên qua email: lethong0804@gmail.com
- Quy định về Bài thuyết trình nhóm GHW
- Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2 hoặc trực tiếp nộp cho GV buổi 1.
- Tuần 4 (buổi thứ 4) thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình.
- Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV
- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị cấm thi theo quy chế. Có đầy đủ điểm kiểm tra, điểm thi kết thúc học phần & nhiệt tình thảo luận, phát biểu xây dựng bài, nghiêm túc trong giờ học.

**Course Name: Algorithms and Data Structure**  
**Course Code: IT013IU**

**1. General information**

Course designation	This subject introduces students to basic data structures and algorithms								
Semester(s) in which the course is taught	4,6								
Person responsible for the course	Dr. Tran Thanh Tung								
Language	English								
Relation to curriculum	Compulsory (All programs)								
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	Introduction to data structures and algorithms, including their design, analysis, and implementation.								
Course learning outcomes	CLO 1. Understand basic data structures and algorithms CLO 2. Analyze and evaluate data structures and algorithms. CLO 3. Design algorithms and select data structures for real world applications.								
	<table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO1</td> </tr> <tr> <td>Skill</td> <td>CLO2, CLO3</td> </tr> <tr> <td>Attitude</td> <td>CLO3</td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1	Skill	CLO2, CLO3	Attitude	CLO3
Competency level	Course learning outcome (CLO)								
Knowledge	CLO1								
Skill	CLO2, CLO3								
Attitude	CLO3								
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> </table>	Topic	Weight	Level					
Topic	Weight	Level							

		Review OOP & Java	3	I	
		Arrays	3	T	
		Complexity	3	T	
		Sorting	3	T, U	
		Queue, Stack	3	T	
		List	6	T	
		Recursion	3	T, U	
		Advanced Sorting	6	T	
		Binary Tree	3	T	
		Hash Table	3	T	
		Graphs	3	T	
		Algorithms on graphs	3	T, U	
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 encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.			
Reading list		1. Michael T. Goodrich and Roberto Tamassia, Data Structures and Algorithms in Java 6th, 2014 2. Cormen, Thomas H., et al. Introduction to algorithms. MIT press, 2009. 3. Lafore, Robert. Data structures and algorithms in Java. Sams publishing, 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	XX					
2		XXX				
3						X

## 3. Planned learning activities and teaching methods

Week	Topic	CL O	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, Midterm	Lecture, Discussion, In class exercises	[1,3]
6	List part 1	1,2	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
7	List part 2	2,3	Lab, Quiz, Midterm	Lecture, Discussion	
8	Recursion	2,3	Lab, Quiz, Midterm	Lecture, Discussion, In class exercises	[1,3]
<b>9</b>	<b>Midterm</b>				
10	Advanced Sorting part 1	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
11	Advanced Sorting part 2	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,2,3]
12	Binary Tree	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[1,3]
13	Hash Table	2,3	Lab, Quiz, Final	Lecture, Discussion	[1,3]
14	Graphs	1,2	Lab, Quiz, Final	Lecture, Discussion, In class exercises	[2,3]
15	Algorithms on graphs	2,3	Lab, Quiz, Final	Lecture, Discussion	[2,3]
16	<b>Final exam</b>				

#### 4. Assessment plan

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

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

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#### 5. Rubrics (optional)

##### 5.1. Grading checklist

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

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	4	3	2	1

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

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

Source: Association of American Colleges and Universities

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

	Capstone	Milestone	Benchmark
	4	3	2

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

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

Source: Association of American Colleges and Universities

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: Principles of Database Management****Course Code: IT079IU****1. General information**

Course designation	
Semester(s) in which the course is taught	4,6
Person responsible for the course	Assoc. Prof. Dr. Nguyen Thi Thuy Loan
Language	English
Relation to curriculum	Compulsory
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	Fundamental of Programming
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.

		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																												
	Knowledge	CLO1																													
	Skill	CLO2, CLO3																													
	Attitude	CLO3																													
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th><b>Topic</b></th> <th><b>Weight</b></th> <th><b>Level</b></th> </tr> </thead> <tbody> <tr> <td>Introduction to Database Systems</td> <td>3</td> <td>I</td> </tr> <tr> <td>Relational Model and Relational Algebra</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>Structured Query Language</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>(Extended) Entity Relationship Model</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>Relational Database Design</td> <td>9</td> <td>T, U</td> </tr> <tr> <td>Normalization</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>Advanced SQL</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>Review</td> <td>3</td> <td>I, U</td> </tr> </tbody> </table>				<b>Topic</b>	<b>Weight</b>	<b>Level</b>	Introduction to Database Systems	3	I	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
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Normalization	6	T, U																													
Advanced SQL	6	T, U																													
Review	3	I, U																													
Examination forms	Multiple-choice questions, short-answer questions																														
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																														
Reading list	<ol style="list-style-type: none"> <li>1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concept 7th, 2020</li> <li>2. Jeffrey A. Hoffer, Ramesh Venkataraman, Heikki Topi, Modern Database Management 13th, 2019</li> <li>3. Ramez Elmasri, Shamkant Navathe, Fundamentals of Database Systems 7th, 2016</li> </ol>																														

## 2. Learning Outcomes Matrix (optional)

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

	SLO				
--	-----	--	--	--	--

CLO	1	2	3	4	5	6
1	XXX					
2		XXX		X		
3		XX		XX		

### 3. Planned learning activities and teaching methods

Week	Topic	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]
<b>5</b>	<b>Midterm</b>				
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]
<b>10</b>	<b>Final exam</b>				

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

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.←

## 5. Rubrics (optional)

### 5.1. Grading checklist

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

### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.

2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

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

### 5.3. Analytic rubric

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

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

<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis )</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis ) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and	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);	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences

	ability to place evidence and perspectives discussed in priority order.	and implications) are identified clearly.	some related outcomes (consequences and implications) are identified clearly.	and implications) are oversimplified .
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Source: Association of American Colleges and Universities

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

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

<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable,	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.

	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**



**Nguyen Van Sinh**

**Course Name: Statistical Learning**  
**Course Code: IT171IU**

**1. General information**

Course designation	Fundamental concepts in Bayesian statistics and its applications		
Semester(s) in which the course is taught	5,7		
Person responsible for the course			
Language	English		
Relation to curriculum	Compulsory (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	Calculus I Probability Statistic and Random Process Fundamentals of Programming		
Course objectives	This is an advanced undergraduate level course that introduces the Bayesian approach to statistical inference for data analysis in a variety of applications, especially in Data Science. This course provides knowledges of the theory of Bayesian inference, and data analysis using statistical software (mostly in Python) will also be emphasized. Topics include: comparison of Bayesian and frequentist methods, Bayesian model specification, prior specification, basics of decision theory, Markov chain Monte Carlo, Bayes factor, empirical Bayes, Bayesian linear regression and generalized linear models, hierarchical models.		
Course learning outcomes	CLO 1. Understand the concept and techniques used in Bayesian statistics CLO 2. Emphasize the roles of Bayesian statistics in practice CLO 3. Link Bayesian statistics to some well-known applications in Data Science. CLO 4. Apply Bayesian statistics in practice using Python		
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">Competency level</th> <th style="text-align: center; padding: 5px;">Course learning outcome (CLO)</th> </tr> </thead> </table>	Competency level	Course learning outcome (CLO)
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Hierarchical model	1	T, U																																													
Metropolis-Hastings algorithm, Gibbs sampling	1	T, U																																													
Theory of MCMC, Convergence diagnostics for MCMC	1	T, U																																													
The bootstrap	1	T, U																																													
Nonparametric statistics: kernel density estimation, regression	1	T, U																																													
Introduction to PyMC3 and its application	1	I, T																																													
Gaussian and Dirichlet Processes.	1	I																																													
Introduction to Variational Bayesian Methods.	1	I																																													
Examination forms	Multiple-choice questions, short-answer questions, long answer questions																																														
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																														
Reading list	1. Andrew Gelman, John B. Carlin, Hal S. Stern, David B. Dunson, Aki Vehtari, and Donald B. Rubin., Bayesian																																														

	Data Analysis., CRC Press/Taylor & Francis, 2013, 3rd Edition. ISBN: 9781439840955 2. Kostas Triantafyllopoulos., Bayesian Inference of State Space Models: Kalman Filtering and Beyond (Springer Texts in Statistics) 1st ed. 2021 Edition
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## 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 O	1	2	3	4	5	6
1	x					
2	x	x				
3	x	x				x
4		x				x

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction, Comparison of frequentist and Bayesian statistics	1		Lecture, Discussion	[1,2,3] Chapter 1
2	Discussion on One-parameter models and related Simulation	1	Exercises	Lecture, In-class exercises	[1,3] Chapter 2
3	The concept of Prior specification: Conjugate prior, Jeffereys prior	1	Exercises	Lecture, In-class exercises	[1,3] Chapter 3
4	Discussion on Empirical Bayes, brute-force posterior simulation	1,2	Exercises	Lecture, In-class exercises	[1,3] Chapter 3,4
5	Introduction to Multivariate models	1,2	Exercises	Lecture, In-class exercises	[1,3] Chapter 5,6
6	<b>Midterm</b>				
7	Discussion on Linear regression, asymptotic approximation to posterior distributions	2,3	Exercises, Labs	Lecture, In-class exercises	[1,3] Chapter 6,7
8	Introduction to Hierarchical model	2,3	Exercises, Labs	Lecture, In-class exercises	[2] Chapter 5

9	Some well-known algorithms: Metropolis-Hastings algorithm, Gibbs sampling	2,3	Exercises, Labs	Lecture, In-class exercises	[2] Chapter 6,7
10	Theory of MCMC, Convergence diagnostics for MCMC	2,3	Exercises	Lecture, In-class exercises	Outside resources
11	Introduction to The bootstrap method	2,3	Exercises	Lecture, In-class exercises	Outside resources
12	Discussion on Nonparametric statistics: kernel density estimation, regression	3,4	Exercises, Labs	Lecture, In-class exercises	[1,3] Chapter 9,10,11
13	Introduction to PyMC3 and its application	3,4	Labs	Lecture, In-class exercises	[1,3] Chapter 12
14	Gaussian and Dirichlet Processes.	4	Exercises	Discussion	Outside resources
15	Introduction to Variational Bayesian Methods.	4		Discussion	Outside resources
16	Revision			Review-test	
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Labs (20%)		50%	50%
Midterm examination (30%)	50%	50%	
Final examination (40%)	20%	50%	30%
Exercises/ Quiz (10%)	50%	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 organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.↔

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports
---------------------------------------

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

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described	Issue/ problem to be considered critically is stated, described, and	Issue/ problem to be considered critically is stated but	Issue/ problem to be considered critically is stated without

	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.	clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

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

Source: Association of American Colleges and Universities

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and	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 observable

	observable and is skillful and makes the content of the presentation cohesive.	consistently observable within the presentation.	observable within the presentation.	within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally

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

*Source: Association of American Colleges and Universities*

**Date revised: February 15, 2022**

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



**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	Nguyen Trung Ky, Dr.		
Language	English		
Relation to curriculum	Elective		
Teaching methods	Lecture, lesson, project, laboratory.		
Workload (incl. contact hours, self-study hours)	Total workload: 195 Contact hours: 45 hours (lectures) + 30 hours (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 Data Structures and Algorithms 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	<table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> </table>	Competency level	Course learning outcome (CLO)
Competency level	Course learning outcome (CLO)		

	Knowledge	CLO 1. Apply knowledge of AI techniques and synthesize solutions to the discipline and ability to develop a range of typical applications using artificial intelligence methods CLO 2. Represent knowledge corresponding to practical problems, design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs by properly using classical search algorithms, including breadth-first, depth-first, A*, and heuristic search	
	Skill	CLO 3. Produce intelligent applications of machine learning with statistical learning methods (Naive Bayes), supervised and unsupervised learning models: decision tree, neural networks, single-layer (perceptron) and multilayer networks CLO 4. Communicate effectively with a range of audiences, ability to use current techniques, skills, and tools necessary for computing practice, ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices and ability to apply design and development principles in the construction of software systems of varying complexity	
	Attitude		
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p>		

Teaching levels: I (Introduce); T (Teach); U (Utilize)			
Topic	Weight	Level	
Introduction and Intelligent Agents	1	I	
States and Searching: Uninformed Search	1	T, U	
States and Searching: Informed and More Sophisticated Search	1	T, U	
Features and Constraints: Constraint Satisfaction Problems	1	T, U	
Features and Constraints: Constraint Satisfaction Problems (continue)	1	T, U	
Reasoning Under Uncertainty: ▪ Random Variables and Events ▪ Joint and Marginal Distributions ▪ Conditional Distribution ▪ Product Rule, Chain Rule, Bayes' Rule ▪ Inference	1	T, U	
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 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] Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach”, 3rd edition, Pearson Education, 2020.		

	<i>Modern Approach</i> ", Fourth Edition, 2020. [2] David L. Poole and Alan K. Mackworth, " <i>Artificial Intelligence: Foundations of Computational Agents</i> ", Second Edition, 2017.
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## 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:

	SL O					
CL O	1	2	3	4	5	6
1	x	x				
2		x				x
3		x				x
4	x	x				x

## 3. Planned learning activities and teaching methods

Wee k	Topic	CL O	Asses smen ts	Learning activities	Resources
1	Introduction and Intelligent Agents	1, 2	Quiz	Lecture, Discussion	[1]. Chapter 1, 2 [2]. Chapter 1
2	States and Searching: Graph Searching Techniques	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	<b>Midterm</b>				

9	Supervised Learning: Neural Networks	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 20
10	Supervised Learning: Neural Networks (continue)	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 20
11	Supervised Learning: Support Vector Machine	3, 4	Quiz	Lecture, In-class quiz	[1]. Chapter 19 [2]. Chapter 15
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]. Chapter 21 [2]. Chapter 16, 22
15	Gaussian Mixture Model and Expectation-Maximization Algorithm	3, 4	Quiz	Lecture, Discussion	[1]. Chapter 20 [2]. Chapter 24
16	Revision			Review-test	
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
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.

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

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>			<b>Benchmark</b>
		<b>4</b>	<b>3</b>	<b>2</b>	
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described	Issue/ problem to be considered critically is stated, described, and	Issue/ problem to be considered critically is stated but	Issue/ problem to be considered critically is stated without	

	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.	clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

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

Source: Association of American Colleges and Universities

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and	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 observable

	observable and is skillful and makes the content of the presentation cohesive.	consistently observable within the presentation.	observable within the presentation.	within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally

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

*Source: Association of American Colleges and Universities*

**Date revised: February 15, 2022**

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



**Nguyen Van Sinh**

**Course Name: Regression Analysis**  
**Course Code: IT136IU**

**1. General information**

1. Course designation	This course covers linear regressions, inference and diagnostic for linear regression models, model selection and transformation.
Semester(s) in which the course is taught	2,4
Person responsible for the course	Assoc. Prof. Vo Thi Luu Phuong, Ph.D.
Language	English
Relation to curriculum	Compulsory, Data Science major
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 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	
Course objectives	Regression analysis is one of the most powerful methods in statistics for determining the relationships between variables and using these relationships to forecast future observations. The foundation of regression analysis is very helpful for any modeling exercise. Regression models are used to predict and forecast future outcomes. Its popularity in finance is very high; it is also very popular in other disciplines like life and biological sciences, management, engineering, etc.
Course learning outcomes	CLO 1. Determine the models representing the relationships between variables and use the models to forecast future observations.  CLO 2. Perform inference and diagnostic of the models; select the best model.  CLO 3. Apply knowledge to various practical datasets.

	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																																							
		Knowledge	CLO1																																						
		Skill	CLO2, CLO3																																						
		Attitude																																							
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th><b>Topic</b></th> <th><b>Weight (Theory + Lab.)</b></th> <th><b>Level</b></th> </tr> </thead> <tbody> <tr> <td>Basic of probabilities and statistics</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>Some tips on R, Python</td> <td>3</td> <td>U</td> </tr> <tr> <td>Simple Linear Regression</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Simple Linear Regression: inferences and diagnostics</td> <td>6+4</td> <td>T, U</td> </tr> <tr> <td>Matrix approach for Simple regression model</td> <td>3+4</td> <td>T, U</td> </tr> <tr> <td>Multiple Linear Regression</td> <td>6+4</td> <td>T, U</td> </tr> <tr> <td>Selecting the best regression model</td> <td>3+4</td> <td>T, U</td> </tr> <tr> <td>Multiple Linear Regression: Diagnostic</td> <td>3+4</td> <td>T, U</td> </tr> <tr> <td>Transformations</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Logistic regression</td> <td>3+4</td> <td>T, U</td> </tr> <tr> <td>Autocorrelation in Time series data</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Final review</td> <td>3+2</td> <td>T</td> </tr> </tbody> </table>		<b>Topic</b>	<b>Weight (Theory + Lab.)</b>	<b>Level</b>	Basic of probabilities and statistics	6	T, U	Some tips on R, Python	3	U	Simple Linear Regression	3	T, U	Simple Linear Regression: inferences and diagnostics	6+4	T, U	Matrix approach for Simple regression model	3+4	T, U	Multiple Linear Regression	6+4	T, U	Selecting the best regression model	3+4	T, U	Multiple Linear Regression: Diagnostic	3+4	T, U	Transformations	3	T, U	Logistic regression	3+4	T, U	Autocorrelation in Time series data	3	T, U	Final review	3+2	T
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Examination forms	Multiple-choice questions, short-answer questions, programming																																								
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																								

Reading list	1. Michael H. Kutner, Christopher J Nachtsheim, John Neter, Applied Linear Regression Models, 4th, 2004 2. Montgomery, D. C., Peck, E. A., and Vining, G., Introduction to Linear Regression Analysis, 5th, 2012
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## 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	XX				
2	XXX	XX				
3						XX

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Basic of probabilities and statistics	1, 2	Quiz	Lecture, discussion, in-class exercise	1,2
2	Some tips on R, Python	1, 2		Lecture, discussion, in-class exercise	1,2
3	Simple Linear Regression	1, 2	Midterm	Lecture, discussion, in-class exercise, laboratory	1,2
4-5	Simple Linear Regression: inferences and diagnostics	1, 2, 3	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
6	Matrix approach for Simple regression model	1, 2	Midterm	Lecture, discussion, in-class exercise, laboratory	1,2
7-8	Multiple Linear Regression	1, 2, 3	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
	<b>Midterm Exam</b>				

8	Selecting the best regression model	2, 3	Final, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
9-10	Multiple Linear Regression: Diagnostic	2, 3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
11	Transformations	2, 3	Final, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
12-13	Logistic regression	1, 2, 3	Quiz, Final, Lab, Homework	Lecture, discussion, in-class exercise, laboratory	1,2
14	Autocorrelation in Time series data	2, 3	Final, Homework	Lecture, discussion, in-class exercise	1,2
15	Final review	1, 2, 3	Final, Homework	Lecture, discussion	1,2
<b>Final exam</b>					

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz, homework (10%)	25%	25%	
Labs (25%)	25%	25%	50%
Midterm examination (30%)	25%	25%	25%
Final examination (35%)	25%	25%	25%

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

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

	Capstone	Milestone	Benchmark
	4	3	2

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

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

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

Source: Association of American Colleges and Universities

**Date revised: February 15, 2022**

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



**Nguyen Van Sinh**

**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 số môn học:	PE018IU
Thuộc khối kiến thức:	CƠ SỞ
Số tín chỉ:	2
Số tiết lý thuyết:	20 (trên lớp)
Số tiết thực hành:	10 (trên lớp)
Số tiết tự học:	90 (về nhà)
Môn học trước:	1. Triết học Mác - Lê nin, 2. Kinh tế chính trị Mác - Lê nin, 3. Chủ nghĩa xã hội khoa học
Giảng viên phụ trách	Khoa Chính trị - Hành chính, ĐHQG-HCM

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

2.1 *Về nội dung*: cung cấp những tri thức có tính hệ thống, cơ bản về sự ra đời của Đảng Cộng sản Việt Nam (1920-1930), sự lãnh đạo của Đảng đối với cách mạng Việt Nam trong thời kỳ đấu tranh giành chính quyền (1930-1945), trong hai cuộc kháng chiến chống thực dân Pháp và đế quốc Mỹ xâm lược (1945-1975), trong sự nghiệp xây dựng, bảo vệ tổ quốc thời kỳ cả nước quá độ lên chủ nghĩa xã hội, tiến hành công cuộc đổi mới (1975-2018).

2.2 *Về tư tưởng*: Thông qua các sự kiện lịch sử và các kinh nghiệm về sự lãnh đạo của Đảng để xây dựng ý thức tôn trọng sự thật khách quan, nâng cao lòng tự hào, niềm tin đối với sự nghiệp lãnh đạo của Đảng.

2.3 *Về kỹ năng*: Trang bị phương pháp tư duy khoa học về lịch sử, kỹ năng lựa chọn tài liệu nghiên cứu, học tập môn học và khả năng vận dụng nhận thức lịch sử vào công tác thực tiễn, phê phán quan niệm sai trái về lịch sử của Đảng.

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

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

**4. Tài liệu phục vụ học tập:**

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

Nam, ban hành 2019.

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

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

Chuẩn đầu ra	Mô tả	Tiêu chí đánh giá	Mục tiêu môn học	Chuẩn đầu ra CDIO CTĐT	Mức độ giảng dạy (I/T/U)
<b>5.1. Kiến thức</b>					
LO.1	NHẬP MÔN ĐỐI TƯỢNG, CHỨC NĂNG, NHIỆM VỤ, NỘI DUNG VÀ PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM	LO. 1.1 - Năm rõ được đối tượng, mục đích học tập, nghiên cứu và một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu Lịch sử Đảng Cộng sản Việt Nam	2.1	1.1.3	13
LO.2	ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ LÃNH ĐẠO ĐẤU TRanh GIÀNH CHÍNH QUYỀN (1930-1945)	LO.2.1 - Năm được bối cảnh lịch sử tác động đến sự ra đời của Đảng Cộng sản Việt Nam LO.2.2 - Năm được quá trình chuẩn bị các điều kiện để thành lập Đảng của Nguyễn Ái Quốc LO.2.3 - Năm được nội dung hội nghị thành lập Đảng và Cương lĩnh chính trị đầu tiên của Đảng LO.2.4 - Hiểu được ý nghĩa lịch sử của việc thành lập Đảng Cộng sản Việt Nam LO.2.5 - Năm rõ các phong trào cách mạng 1930-1935 và các chủ trương khôi phục phong trào năm 1932-1935 LO.2.6 - Năm rõ phong trào dân chủ năm 1936-1939	2.1 2.1 2.1 2.1 2.1	1.1.3 T4	

		LO.2.7 - Năm rõ phong trào giải phóng dân tộc 1939--1945			
		LO.2.8 - Hiểu rõ tính chất, ý nghĩa và kinh nghiệm của Cách mạng Tháng Tám năm 1945	2.1		

LO.3	ĐẢNG LÃNH ĐẠO HAI CUỘC KHÁNG CHIẾN, HOÀN THÀNH GIẢI PHÓNG DÂN TỘC, THỐNG NHẤT ĐẤT NƯỚC (1945-1975)	LO.3.1 - Hiểu được chủ trương xây dựng và bảo vệ chính quyền cách mạng 1945-1946	2.1	1.1.3	T4
		LO.3.2 - Hiểu rõ Đường lối kháng chiến toàn quốc chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946-1950			
		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			
		LO.3.5 - Năm được quá trình lãnh đạo cách mạng hai miền giai đoạn 1954-1965 của Đảng	2.1		T4
		LO.3.6 - Năm vững sự lãnh đạo cách mạng cả nước giai đoạn 1965-1975 của Đảng			
		LO.3.7 - Hiểu rõ Ý nghĩa và kinh nghiệm lãnh đạo của Đảng trong cuộc kháng chiến chống Mỹ, cứu nước 1954-1975			

LO.4	<p><b>ĐẢNG LÃNH ĐẠO CỦA NƯỚC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIẾN HÀNH CÔNG CUỘC ĐỔI MỚI (1975-2018)</b></p>	LO.4.1 - Hiểu rõ chủ trương xây dựng chủ nghĩa xã hội và bảo vệ Tổ quốc 1975- 1981	2.1 2.2	1.1.3	T4
		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, đura 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			
		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			

### 5.2. Kỹ năng

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

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

Buổi (3 tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1	<b>Giới thiệu về môn học</b>	LO.1, LO.5;	<p><b>Dạy:</b></p> <ul style="list-style-type: none"> <li>- Giới thiệu đề cương môn học</li> <li>- Giới thiệu nội dung đề tài thuyết trình nhóm GHW)</li> </ul> <p><b>Học ở lớp:</b></p> <ul style="list-style-type: none"> <li>- Chia nhóm (5 SV/nhóm)</li> <li>- Giới thiệu nhóm học tập</li> </ul> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Chọn đề tài thuyết trình của nhóm (GHW)</li> </ul>	
2	<p><b>Chương nhập môn</b></p> <p><b>ĐỐI TƯỢNG, CHỨC NĂNG, NHIỆM VỤ, NỘI DUNG VÀ PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM</b></p>	LO.1;	<p><b>Dạy:</b></p> <p>I. ĐỐI TƯỢNG NGHIÊN CỨU CỦA MÔN HỌC LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM</p> <ol style="list-style-type: none"> <li>1. Đối tượng nghiên cứu</li> <li>2. Phạm vi nghiên cứu</li> </ol> <p>II. CHỨC NĂNG, NHIỆM VỤ CỦA MÔN HỌC LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM</p> <ol style="list-style-type: none"> <li>1. Chức năng của khoa học Lịch sử Đảng</li> <li>2. Nhiệm vụ của môn học</li> </ol> <p>III. PHƯƠNG PHÁP NGHIÊN CỨU, HỌC TẬP MÔN LỊCH SỬ ĐẢNG CỘNG SẢN VIỆT NAM</p> <ol style="list-style-type: none"> <li>1. Phương pháp luận</li> <li>2. Các phương pháp cụ thể</li> </ol> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p>	Thi giữa kỳ (Quiz)

3	<p><b>Chương 1</b>  <b>ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ LÃNH ĐẠO ĐẦU TRANG GIÀNH CHÍNH QUYỀN (1930-1945)</b></p>	LO.2	<p><b>Dạy:</b></p> <ul style="list-style-type: none"> <li>I. ĐẢNG CỘNG SẢN VIỆT NAM RA ĐỜI VÀ CƯƠNG LĨNH CHÍNH TRỊ ĐẦU TIÊN CỦA ĐẢNG (THÁNG 2-1930)             <ul style="list-style-type: none"> <li>. Bối cảnh lịch sử</li> <li>. Nguyễn Ái Quốc chuẩn bị các điều kiện để thành lập Đảng</li> <li>. Thành lập Đảng Cộng sản Việt Nam và Cương lĩnh chính trị đầu tiên của Đảng</li> <li>4. Ý nghĩa lịch sử của việc thành lập Đảng Cộng sản Việt Nam</li> </ul> </li> <li>II. ĐẢNG LÃNH ĐẠO ĐẦU TRANG GIÀNH CHÍNH QUYỀN (1930-1945)             <ul style="list-style-type: none"> <li>1.Phong trào cách mạng 1930- 1935 và khôi phục phong trào 1932-1935</li> <li>2.Phong trào dân chủ 1936-1939</li> <li>3.Phong trào giải phóng dân tộc 1939-1945</li> <li>4.Tính chất, ý nghĩa và kinh nghiệm của Cách mạng Tháng Tám năm 1945</li> </ul> </li> </ul> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p>	<p>Thi giữa kỳ (Quiz)</p> <p>Thi cuối kỳ (FEX)</p>
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			<b>Dạy:</b> I. ĐẢNG LÃNH ĐẠO XÂY DỰNG, BẢO VỆ CHÍNH QUYỀN CÁCH MẠNG VÀ KHÁNG CHIẾN CHỐNG THỰC DÂN PHÁP XÂM LUỢC (1945-1954) 1. Xây dựng và bảo vệ chính quyền cách mạng 1945-1946 2. Đường lối kháng chiến toàn quốc chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946-1950 3. Đẩy mạnh cuộc kháng chiến chống thực dân Pháp xâm lược và quá trình tổ chức thực hiện từ năm 1946 đến năm 1950 4. Ý nghĩa lịch sử và kinh nghiệm của Đảng trong lãnh đạo kháng chiến chống thực dân Pháp và can thiệp Mỹ <b>Dạy:</b> Chấm thuyết trình & phản biện <b>Học ở lớp:</b> Các nhóm thuyết trình tại lớp II. LÃNH ĐẠO XÂY DỰNG CHỦ NGHĨA XÃ HỘI Ở MIỀN BẮC VÀ KHÁNG CHIẾN CHỐNG ĐẾ QUỐC MỸ XÂM LUỢC GIẢI PHÓNG MIỀN NAM, THỐNG NHẤT ĐẤT NƯỚC (1954-1975) 1. Lãnh đạo cách mạng hai miền giai đoạn 1954-1965 2. Lãnh đạo cách mạng cả nước giai đoạn 1965-1975 3. Ý nghĩa và kinh nghiệm lãnh đạo của Đảng trong cuộc kháng chiến chống Mỹ, cứu nước 1954-1975 <b>Học ngoài lớp:</b> Đọc trước tài liệu chương 2	Thuyết trình nhóm (GHW)	Thi cuối kỳ (FEX)
4	<b>Chương 2</b> <b>ĐẢNG LÃNH ĐẠO HAI CUỘC KHÁNG CHIẾN, HOÀN THÀNH GIẢI PHÓNG DÂN TỘC, THỐNG NHẤT ĐẤT NƯỚC (1945-1975)</b>	LO.3 LO.5			

				<b>Dạy</b> I.ĐẢNG LÃNH ĐẠO CẢ NUỐC XÂY DỰNG CHỦ NGHĨA XÃ HỘI VÀ BẢO VỆ TÔ QUỐC (1975-1986) 1.Xây dựng chủ nghĩa xã hội và bảo vệ Tổ quốc 1975-1981 2.Đại hội đại biểu toàn quốc lần thứ V của Đảng và các bước đột phá tiếp tục đổi mới kinh tế 1982-1986 <b>Dạy:</b> Chấm thuyết trình & phản biện <b>Học ở lớp:</b> Thảo luận tại lớp II.LÃNH ĐẠO CÔNG CUỘC ĐỔI MỚI, ĐẨY MẠNH CÔNG NGHIỆP HÓA, HIỆN ĐẠI HÓA VÀ HỘI NHẬP QUỐC TẾ (1986-2018) 1. Đổi mới toàn diện, đưa đất nước ra khỏi khủng hoảng kinh tế - xã hội 1986-1996 2. Tiếp tục công cuộc đổi mới, đẩy mạnh công nghiệp hóa, hiện đại hóa và hội nhập quốc tế 1996-2018 3. Thành tựu, kinh nghiệm của công cuộc đổi mới <b>TỔNG LUẬN</b> 1.Những thắng lợi vĩ đại của cách mạng Việt Nam 2.Những bài học lớn về sự lãnh đạo của Đảng <b>Học ngoài lớp:</b> Hoàn thiện bài thuyết trình	
5	<b>Chương 3</b> <b>ĐẢNG LÃNH ĐẠO CẢ NUỐC QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI VÀ TIẾN HÀNH CÔNG CUỘC ĐỔI MỚI (1975-2018)</b>	LO.4 LO.5		Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	

## 7. Đánh giá môn học

STT	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	20%	Thuyết trình và bản báo cáo nhóm	LO.3 LO.4 LO.5

2	Quiz	Bài thi giữa kỳ	Thi theo đề thi chung	30%	Tự luận	LO.1 LO.2;
3	DIC	Thảo luận tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	Cộng tối đa 1 điểm vào bài thi cuối kỳ	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	
4	FEX	Thi cuối kỳ	Đề thi bao quát toàn bộ nội dung môn học	50%	Trắc nghiệm	LO.2; LO.3, LO.4;
		<b>Tổng cộng</b>		<b>100%</b>		

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

TT	Chuẩn đầu ra	Nội	Phương	Tiêu chí đánh giá
LO.1	Nắm được đối tượng, mục đích học tập, nghiên cứu và một số yêu cầu cơ bản về phương pháp học tập, nghiên cứu	Chương nhập môn	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.2	Hiểu rõ quá trình ra đời của Đảng Cộng sản Việt Nam (1920-1930), nội dung cơ bản, giá trị lịch sử của Cương lĩnh chính trị đầu tiên của Đảng và quá trình Đảng lãnh đạo cuộc đấu tranh giành độc lập, giành chính quyền (1930-1945)	Chương 1	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.3 LO.5	Nắm rõ quá trình lãnh đạo của Đảng đối với hai cuộc kháng chiến chống thực dân Pháp và đế quốc Mỹ xâm lược, hoàn thành giải phóng dân tộc, thống nhất đất nước thời kỳ 1945-1975	Chương 2	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của GV

LO.4  LO.5	Hiểu được quá trình phát triển đường lối và sự lãnh đạo của Đảng đưa cả nước quá độ lên chủ nghĩa xã hội và tiến hành công cuộc đổi mới từ sau ngày thống nhất đất nước năm 1975 đến nay. Từ đó rút ra được những thắng lợi và những bài học kinh nghiệm trong quá trình lãnh đạo cách mạng của Đảng.	Chương 3	Thảo luận tại lớp (Discussion in Class)  Thi cuối kỳ (FEX)	Ngân hàng đề của GV .
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## 9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: daotao.spas@vnuhcm.edu.vn
- Quy định về Bài thuyết trình nhóm GH
- Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2.

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

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

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

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

**Course Nam: General Law**  
**Course Code: PE021IU**

### 1. General information

<b>Department</b>	Office of Academic Affairs
<b>Course classification</b>	Foundation course
<b>Course designation</b>	Face to face
<b>Semester(s) in which the course is taught</b>	All semesters in each academic year
<b>Person responsible for the course</b>	Dr. Vo Tuong Huan LLM. Bui Doan Danh Thao
<b>Language</b>	English
<b>Relation to curriculum</b>	Compulsory
<b>Teaching methods</b>	Student-centred approach
<b>Workload (incl. contact hours, self-study hours)</b>	(Estimated) Total workload: 127.5 hours Contact hours (lecture, in class discussions): 37.5 hours (=45 periods) Private study including examination preparation, specified in hours <sup>6</sup> : 90 hours
<b>Credit points</b>	3
<b>Required and recommended prerequisites for joining the course</b>	N/A

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<sup>6</sup> When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

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

<b>Study and examination requirements</b>	<p>To pass this course, the students must:</p> <ul style="list-style-type: none"> <li>• Achieve a composite mark of at least 50; and</li> <li>• Make a satisfactory attempt at all assessment tasks (see below).</li> </ul> <p><b>GRADING POLICY</b></p> <p>Grades can be based on the following:</p> <table border="1"> <tbody> <tr> <td>Assignment</td><td>20%</td></tr> <tr> <td>Midterm examination</td><td>30%</td></tr> <tr> <td>Final examination</td><td>50%</td></tr> <tr> <td><b>Total</b></td><td>100%</td></tr> </tbody> </table> <p><b>COURSE POLICIES</b></p> <p><b>Attendance</b></p> <p>Regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty percent of scheduled classes they may be refused final assessment. Exemptions may only be made on eligible medical grounds.</p> <p><b>Workload</b></p> <p>It is expected that the students will spend at least <i>six</i> hours per week studying this course. This time should be made up of reading, research, working on exercises and problems, and attending classes. In periods where they need to complete assignments or prepare for examinations, the workload may be greater.</p> <p>Over-commitment has been a cause of failure for many students. They should take the required workload into account when planning how to balance study with part-time jobs and other activities.</p> <p><b>General Conduct and Behaviour</b></p> <p>The students are expected to conduct themselves with consideration and respect for the needs of fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students will be asked to leave the class. The use of laptops is also encouraged during law lessons only to search for materials online. More information on student conduct is available on <a href="#">the university webpage</a>.</p>	Assignment	20%	Midterm examination	30%	Final examination	50%	<b>Total</b>	100%
Assignment	20%								
Midterm examination	30%								
Final examination	50%								
<b>Total</b>	100%								

	<p><b>Keeping informed</b></p> <p>The students should take note of all announcements made in lectures or on the course's Blackboard, and another announced mean of communications. From time to time, the university will send important announcements to their university e-mail addresses without providing a paper copy. The students will be deemed to have received this information.</p> <p><b>Academic honesty and plagiarism</b></p> <p>Plagiarism is the presentation of the thoughts or work of another as one's own. Students are also reminded that careful time management is an important part of the study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items. The university regards plagiarism as a form of academic misconduct and has very strict rules regarding plagiarism.</p> <p><b>Special consideration</b></p> <p>Requests for special consideration (for final examination only) must be made to the Office of Academic Affairs within one week after the examination. General policy and information on special consideration can be found at the Office of Academic Affairs. Absence on the Mid-term is not allowed, or in special cases approved by Lecturer can be replaced with relevant Assignment.</p> <p><b>Meeting up with the lecturers after classes</b></p> <p>Students must make an appointment via emails if they want to meet up with the lecturer after classes and be on time. If there are any changes to the scheduled time, students must inform the lecturer immediately.</p>
<b>Reading list</b>	<p>Please note that it is very important to gain familiarity with the subject matter in the readings and cases available on Blackboard and the internet <i>before</i> attendance in classes.</p> <p><b>Required Course Texts and Materials</b></p> <p><u>Legal Texts:</u></p> <ol style="list-style-type: none"> <li>1. Constitution of Vietnam - 2013</li> <li>2. Civil Code of Vietnam - 2015</li> <li>3. Criminal Code of Vietnam – 2015 (amended in 2017)</li> <li>4. Law on Law on Handling of Administrative Violations 2012</li> <li>5. Law on Enterprises – 2020</li> </ol>

6. Labour Code 2019  
 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) (2<sup>nd</sup> 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

UNCTAD (United Nations Conference on Trade and Development)

WTO (World Trade Organization)

MOIT - Vietnam (Official website of Ministry of Industry and Trade)

MPI - Vietnam (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 VNU - Central Library. 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.

	<ul style="list-style-type: none"> <li>University of Law Ho Chi Minh City, <i>Giáo trình Luật hành chính</i>, NXB Hồng Đức 2022.</li> <li>University of Law Ho Chi Minh City, <i>Giáo trình Luật hình sự Việt Nam</i>, NXB Hồng Đức 2022.</li> <li>University of Law Ho Chi Minh City, <i>Giáo trình Luật dân sự Việt Nam</i>, NXB Hồng Đức 2022.</li> <li>University of Law Ho Chi Minh City, <i>Giáo trình Luật lao động Việt Nam</i>, NXB Hồng Đức 2022.</li> <li>University of Law Ho Chi Minh City, <i>Giáo trình pháp luật về chủ thể kinh doanh</i>, NXB Hồng Đức 2022.</li> </ul>
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## 2. Learning Outcomes Matrix (optional)

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

SLO	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

W e e k	Topic	CLO	Assess ments	Lear ning activ ities	Resources
1	<b>Introduction to State</b> <ul style="list-style-type: none"> <li>What is State?</li> <li>Nature of state</li> <li>Forms of state</li> <li>Functions of state</li> <li>Introduction to structure of Vietnamese state</li> </ul>	1-5 (level I - introduced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT - Introduction to Vietnamese legal system available on Blackboard

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

	<ul style="list-style-type: none"> <li>Duties of the state in prevention of corruption</li> </ul>				
5	<p><b>Administrative Law</b></p> <ul style="list-style-type: none"> <li>Definition and nature of administrative law</li> <li>Administrative law violations</li> <li>Liabilities for breach of administrative law, exemption from the liability</li> </ul>	1-5 (Level 1 R - reinforced)	<p>Tests Peer evaluations Case studies Class-performance evaluations</p>	<p>Discussions Case studies and law on anti-corruption</p>	<p>PPT – Administrative law available on Blackboard  Law on handling administrative violations 2012, and Law on anti-corruption 2018 available on Blackboard</p>
6	<p><b>Criminal Law</b></p> <ul style="list-style-type: none"> <li>Definition and nature of criminal law</li> <li>Crimes</li> <li>Punishments</li> </ul>	1-5 (Level 1 R - reinforced)	<p>Tests Peer evaluations Case studies, especially cases related to corruption</p>	<p>Discussions Case studies, especially cases related to corruption</p>	<p>PPT – Criminal law available on Blackboard  Criminal code 2015 available on Blackboard</p>
7	<p><b>Criminal Law (Cont)</b></p> <ul style="list-style-type: none"> <li>Crimes related to corruption</li> <li>Punishments for corruption</li> </ul>	1-5 (Level 1 R - reinforced)	<p>Tests Peer evaluations Case studies, especially cases related to corruption</p>	<p>Discussions Case studies, especially cases related to corruption</p>	<p>PPT – Criminal law available on Blackboard  Criminal code 2015 available on Blackboard</p>

				corruption	
8	<b>Revision for mid-term exam</b>		Quizzes Projects		
9	<b>Civil Law (Part I)</b> <ul style="list-style-type: none"> <li>• Definition and nature Civil law relationship</li> <li>• Subject of civil law</li> <li>• Property and ownership</li> <li>• Civil transactions</li> </ul>	1-5 (Leve 1 R - reinforced)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard  Civil code 2015 available on Blackboard
10	<b>Civil Law (Part II)</b> <ul style="list-style-type: none"> <li>• Contracts</li> <li>- Definitions</li> <li>- Formation of contracts</li> <li>- Validity of contracts</li> <li>- Liability for breach of contracts</li> </ul>	1-5 (Leve 1 M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard  Civil code 2015 available on Blackboard
11	<b>Civil Law (Part III)</b> <ul style="list-style-type: none"> <li>• Inheritance</li> <li>- Testamentary inheritance</li> <li>- Intestacy</li> </ul>	1-5 (Leve 1 M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Civil law available on Blackboard  Civil code 2015 available on Blackboard
12	<b>Law on Enterprises</b> <ul style="list-style-type: none"> <li>• Introduction to law on enterprises</li> <li>• Introduction to forms, features, establishment, reorganization and</li> </ul>	1-5 (Leve 1 I - Introduced )	Tests Peer evaluations Class-performance	Discussions Case studies	PPT– Law on enterprises available on Blackboard  Law on enterprises 2020 available on Blackboard

	dissolution of an enterprise		evaluations		
1 3	<b>Labor Law</b> <ul style="list-style-type: none"> <li>• Definition, and nature of labour law</li> <li>• Employees and employers</li> <li>• Working time, and resting time</li> <li>• Salary (including salary for overtime working hours)</li> </ul>	1-5 (Leve 1 M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Labor law available on Blackboard  Labor code 2019 available on Blackboard
1 4	<b>Labour Law (Cont.)</b> <ul style="list-style-type: none"> <li>• Employment contracts</li> <li>• Labor disciplines</li> <li>• Dispute settlements</li> </ul>	1-5 (Leve 1 M - Mastery)	Tests Peer evaluations Class-performance evaluations	Discussions Case studies	PPT– Labor law available on Blackboard  Labor code 2019 available on Blackboard
1 5	<b>Revision/ Tutoring classes</b>		Quizzes Projects		

#### 4. Assessment plan

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

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

## 5. Rubrics

No.	CL Os	Criteria	COMPLETELY FAIL Below 30%	INADEQUATE 30% – 49%	ADEQUATE 50% - 69%	ABOVE AVERAGE 70% - 89%	EXEMPLARY ≥ 90%
1	CL O 1	<b>Organisation and clarification</b>	No evidence of organisation and coherence	Does not organise ideas logically and with clarification  Limited evidence of coherence  Ideas lack consistency	Generally organised logically, with evidence of progression  Occasionally, there may be a lack of focus or ideas may be tangential	Clearly organizes and progression.  Responds appropriately and relevantly, although some ideas are underdeveloped	Response is focused, detailed and non-tangential.  Shows a high degree of attention to logic and reasoning of points.  Clearly leads the reader to the conclusion and stirs thought regarding the topic
			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	Shows ability to identify legal issues, gather the facts and develop claims.	Shows strong ability to identify legal issues, gather the facts and develop claims as well as link claims	Shows strong ability to identify legal issues, gather the facts and develop claims as well as link claims

				addressed incompletely.	Argument are addressed well but no links with evidence	with evidence. Overall, an acceptable solution is offered and explained	with evidence. Satisfactory solutions are offered and supported
3		<b>Use of data/information</b>	Shows no effort to incorporate information from primary and secondary sources	Shows little information from sources. Poor handling of sources	Shows moderate amount of source information incorporated. Some key points supported by sources. Quotations may be poorly integrated into paragraphs. Some possible problems with source citations	Draws upon sources to support most points. Some evidence may not support arguments or may appear where inappropriate. Quotations integrated well into paragraphs. Sources cited correctly	Draws upon primary and secondary source information in useful and illuminating ways to support key points. Excellent integration of quoted material into paragraphs. Source cited correctly
4	CL O2	<b>Use of frameworks</b>	Shows no effort to structure problems	Shows limited ability to structure	Shows effort to link problem	Shows ability to structure problems	Shows ability to structure problems

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

**Course Name: Tư tưởng Hồ Chí Minh  
(Ho Chi Minh's Thoughts)**

**Course Code: PE019IU**

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

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

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

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

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

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

**2.4.**

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

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

**4. Tài liệu phục vụ học tập:**

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

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

- Hồ Chí Minh (2011), *Toàn tập*, Nxb. Chính trị quốc gia Sự thật, Hà Nội.
- Hồ Chí Minh (2016), *Biên niên tiểu sử*, Nxb. Chính trị quốc gia Sự thật, Hà Nội.

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

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

LO.3	TU TƯỞNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC VÀ CHỦ NGHĨA XÃ HỘI	<p>LO.3.1 - Nhận thức được bản chất khoa học, cách mạng và những sáng tạo tư tưởng Hồ Chí Minh về độc lập dân tộc và cách mạng giải phóng dân tộc.</p> <p>LO.3.2 - Nắm được quan điểm của Hồ Chí Minh về tính tất yếu di lên chủ nghĩa xã hội, xây dựng chủ nghĩa xã hội và thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam.</p> <p>LO.3.3 - Nắm được quan điểm Hồ Chí Minh về mối quan hệ giữa độc lập dân tộc và chủ nghĩa xã hội.</p> <p>LO.3.4 - Vận dụng tư tưởng Hồ Chí Minh về độc lập dân tộc gắn liền với chủ nghĩa xã hội trong sự nghiệp cách mạng hiện nay.</p>	2.1 2.1 2.1	1.1.3	T4
LO.4	TU TƯỞNG HỒ CHÍ MINH VỀ ĐẢNG CỘNG SẢN VIỆT NAM VÀ NHÀ NUỐC CỦA NHÂN DÂN, DO NHÂN DÂN, VÌ NHÂN DÂN	<p>LO.4.1 - Nắm được nội dung cơ bản tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt Nam.</p> <p>LO.4.2 - Nắm được nội dung cơ bản tư tưởng Hồ Chí Minh về nhà nước của nhân dân, do nhân dân, vì nhân dân.</p> <p>LO.4.3 - Vận dụng tư tưởng Hồ Chí Minh vào công tác xây dựng Đảng và xây dựng Nhà nước.</p>	2.1 2.1 2.1	1.1.3	I4 I4 T4
LO.5	TU TƯỞNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT TOÀN DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ	<p>LO.5.1 - Hiểu được những quan điểm cơ bản của tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc.</p> <p>LO.5.2 - Hiểu được những quan điểm cơ bản của tư tưởng Hồ Chí Minh về đoàn kết quốc tế</p> <p>LO.5.3 - Vận dụng tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đoàn kết quốc tế trong giai đoạn hiện nay</p>	2.1 2.1 2.1	1.1.3	I4 T4

LO.6	TU' TUỞNG HỒ CHÍ MINH VỀ VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI	LO.6.1 - Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về văn hóa.	2.1		I4
		LO.6.2 - Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về đạo đức mới (đạo đức cách mạng).			
		LO.6.3 - Nắm được kiến thức cơ bản tư tưởng Hồ Chí Minh về văn hóa.	2.1	1.1.3	I4
		LO.6.4 - Vận dụng tư tưởng Hồ Chí Minh về văn hóa, đạo đức, con người trong việc xây dựng văn hóa, đạo đức, con người Việt Nam hiện nay.	2.1		T4

### 5.2. Kỹ năng

LO.7	THỂ HIỆN KHẢ NĂNG TỰ DUY, PHÂN TÍCH, ĐÁNH GIÁ, TRANH LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.7.1 Có kỹ năng tư duy, phân tích, đánh giá tư tưởng Hồ Chí Minh.	2.2	2.1.1 2.3.1  2.4.4	
		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			U4
		LO.7.3. Có kỹ năng vận dụng sáng tạo tư tưởng Hồ Chí Minh vào giải quyết các vấn đề trong thực tiễn đời sống, học tập và công tác.	2.2	2.5	

### 5.3. Thái độ

LO.8	THỂ HIỆN Ý THỨC, NHẬN THỨC TRONG VÀ SAU KHI HỌC TẬP	LO.6.1. Nhận thức được vai trò, giá trị của tư tưởng Hồ Chí Minh đối với Đảng và dân tộc Việt Nam.	2.3	3.1	
		LO.6.2. Có bản lĩnh chính trị, yêu nước, trung thành với mục tiêu, lý tưởng độc lập dân tộc gắn liền với chủ nghĩa xã hội			U3
		LO.6.3. Thấy được trách nhiệm của bản thân trong việc học tập,	2.3		

		nghiên cứu, vận dụng trong cuộc sống, góp phần vào sự nghiệp xây dựng và bảo vệ Tổ quốc			
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## 6. Kế hoạch giảng dạy theo buổi học (Course Plan):

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

3	<b>Chương 2</b> CƠ SỞ, QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỀN TU' TUỔNG HỒ CHÍ MINH	LO.2	<p><b>Dạy:</b></p> <p>I. CƠ SỞ HÌNH THÀNH TU' TUỔNG HỒ CHÍ MINH</p> <ol style="list-style-type: none"> <li>1. Cơ sở thực tiễn</li> <li>2. Cơ sở lý luận</li> <li>3. Nhân tố chủ quan</li> </ol> <p>II. QUÁ TRÌNH HÌNH THÀNH VÀ PHÁT TRIỀN TU' TUỔNG HỒ CHÍ MINH</p> <ol style="list-style-type: none"> <li>1. Thời kỳ trước ngày 5-6-1911: Hình thành tư tưởng yêu nước và có chí hướng tìm con đường mới</li> <li>2. Thời kỳ từ năm 1911 đến cuối năm 1920: Dần dần hình thành tư tưởng cứu nước, giải phóng dân tộc Việt Nam theo con đường cách mạng vô sản 3;</li> <li>Thời kỳ từ cuối năm 1920 đến đầu năm 1930: Hình thành những nội dung cơ bản tư tưởng về cách mạng Việt Nam</li> <li>4. Thời kỳ đầu năm 1930 đến đầu năm 1941: Vượt qua thử thách, giữ vững đường lối, phương pháp cách mạng Việt Nam đúng đắn, sáng tạo</li> <li>5. Thời kỳ từ đầu năm 1941 đến tháng 9 - 1969: Tư tưởng Hồ Chí Minh tiếp tục phát triển, hoàn thiện, soi đường cho sự nghiệp cách mạng của Đảng và nhân dân ta</li> </ol> <p>III. GIÁ TRỊ TU' TUỔNG HỒ CHÍ MINH</p> <ol style="list-style-type: none"> <li>1. Đối với cách mạng Việt Nam</li> <li>2. Đối với sự phát triển tiến bộ của nhân loại</li> </ol> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b></p> <p>Đọc trước tài liệu chương 3</p>	Thi giữa kì (Quiz) Thi cuối kì (FEX)
4	<b>Chương 3</b> TU' TUỔNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC	L0.3 L0.5	<p><b>Dạy:</b></p> <p>I. TU' TUỔNG HỒ CHÍ MINH VỀ ĐỘC LẬP DÂN TỘC</p> <ol style="list-style-type: none"> <li>1. Vấn đề độc lập dân tộc</li> <li>2. Về cách mạng giải phóng dân tộc</li> </ol> <p><b>Dạy:</b> Châm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Các nhóm thuyết trình tại lớp</p> <p>II. TU' TUỔNG HỒ CHÍ MINH VỀ CHỦ NGHĨA XÃ HỘI VÀ XÂY DỰNG CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM</p> <ol style="list-style-type: none"> <li>1. Tư tưởng Hồ Chí Minh về chủ nghĩa xã hội</li> </ol>	Thuyết trình nhóm (GHW) Thi cuối kì (FEX)

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

	TƯ TUỔNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ	<p>1.Vai trò của đại đoàn kết dân tộc</p> <p>2.Lực lượng của khối đại đoàn kết dân tộc</p> <p>3.Điều kiện để xây dựng khối đại đoàn kết toàn dân tộc</p> <p>4.Hình thức, nguyên tắc tổ chức của khối đại đoàn kết dân tộc - Mặt trận dân tộc thống nhất</p> <p>5. Phương thức xây dựng khối đại đoàn kết dân tộc</p> <p><b>Dạy:</b> Chấm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Thảo luận tại lớp</p> <p>II.TƯ TUỔNG HỒ CHÍ MINH VỀ ĐOÀN KẾT QUỐC TẾ</p> <p>1.Sự cần thiết phải đoàn kết quốc tế</p> <p>2.Lực lượng đoàn kết quốc tế và hình thức tổ chức</p> <p>3.Nguyên tắc đoàn kết quốc tế</p> <p>III.VẬN DỤNG TƯ TUỔNG HỒ CHÍ MINH VỀ ĐẠI ĐOÀN KẾT DÂN TỘC VÀ ĐOÀN KẾT QUỐC TẾ TRONG GIAI ĐOẠN HIỆN NAY</p> <p>1.Quán triệt tư tưởng Hồ Chí Minh về đại đoàn kết dân tộc và đoàn kết quốc tế trong hoạch định chủ trương, đường lối của Đảng</p> <p>2.xây dựng khối đại đoàn kết toàn dân tộc trên nền tảng liên minh công - nông - trí thức dưới sự lãnh đạo của Đảng</p> <p>3.Đại đoàn kết dân tộc phải kết hợp với đoàn kết quốc tế</p>	
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7	<b>Chương 6</b>  <b>TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI</b>	<p><b>Dạy:</b></p> <p>I. TƯ TƯỞNG HỒ CHÍ MINH VỀ VĂN HÓA</p> <ol style="list-style-type: none"> <li>1.Một số nhận thức chung về văn hóa và quan niệm giữa văn hóa với các lĩnh vực khác</li> <li>2.Quan điểm của Hồ Chí Minh về vai trò của văn hóa</li> <li>3.Quan điểm của Hồ Chí Minh về xây dựng nền văn hóa mới</li> </ol> <p><b>Dạy:</b> Chấm thuyết trình &amp; phản biện</p> <p><b>Học ở lớp:</b> Thảo luận tại lớp</p> <p>II. TƯ TƯỞNG HỒ CHÍ MINH VỀ ĐẠO ĐỨC</p> <ol style="list-style-type: none"> <li>1. Quan điểm về vai trò và sức mạnh của đạo đức cách mạng</li> <li>2.Quan điểm về những chuẩn mực đạo đức cách mạng</li> <li>3.Quan điểm về những nguyên tắc xây dựng đạo đức cách mạng</li> </ol> <p>III.TƯ TƯỞNG HỒ CHÍ MINH VỀ CON NGƯỜI</p> <ol style="list-style-type: none"> <li>1.Quan niệm Hồ Chí Minh về con người</li> <li>2.Quan niệm của Hồ Chí Minh về vai trò của con người</li> <li>3.Quan niệm Hồ Chí Minh về xây dựng con người</li> </ol> <p>IV.XÂY DỰNG VĂN HÓA, ĐẠO ĐỨC, CON NGƯỜI VIỆT NAM HIỆN NAY THEO TƯ TƯỞNG HỒ CHÍ MINH</p> <ol style="list-style-type: none"> <li>1.Xây dựng và phát triển văn hóa, con người</li> <li>2.Về xây dựng đạo đức cách mạng</li> </ol>	
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## 7. Đánh giá môn học

ST T	Mã	Tên	Mô tả	Tỷ Trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	150%	Thuyết trình và bản báo cáo nhóm	LO.2, LO.3, LO.4, LO.5, LO.6.
2	Quiz	Bài thi giữa kỳ	Giảng viên cho thi	20%	Trắc nghiệm (đề đóng) hoặc tự luận (đề mở)	LO.2, LO.3.

<b>3</b>	DIC	Thảo luận tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần thảo luận cao nhất.	15%	Phát biểu/đặt câu hỏi trên lớp hoặc phiếu trả lời trong các nghiên cứu tình huống tại lớp	LO.3, LO.4, LO.5, LO.6.
<b>4</b>	FEX	Thi cuối kỳ	Thi đề chung Đề thi bao quát toàn bộ nội dung môn học	50%	Tự luận (đề mở)	LO.2, LO.3, LO.4, LO.5,
			<b>Tổng cộng</b>	<b>100%</b>		

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

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	<ul style="list-style-type: none"> <li>- Hiểu được khái niệm tư tưởng Hồ Chí Minh.</li> <li>- Nắm được đối tượng; phương pháp nghiên cứu tư tưởng Hồ Chí Minh và ý nghĩa học tập môn tư tưởng Hồ Chí Minh.</li> </ul>	Chương 1	Hỏi - Đáp	Cộng điểm
LO.2	<ul style="list-style-type: none"> <li>- Hiểu rõ cơ sở, quá trình hình thành và phát triển tư tưởng Hồ Chí Minh.</li> <li>- Nắm được giá trị tư tưởng Hồ Chí Minh đối với cách mạng Việt Nam và thế giới.</li> </ul>	Chương 2	Thi giữa kỳ (Quiz)	Đề thi của GV
LO.3	<ul style="list-style-type: none"> <li>- Nắm rõ nội dung tư tưởng Hồ Chí Minh về độc lập dân tộc và chủ nghĩa xã hội; mối quan hệ giữa độc lập dân tộc và chủ nghĩa xã hội.</li> <li>- Hiểu được sự vận dụng tư tưởng Hồ Chí Minh về độc lập dân tộc và chủ nghĩa xã hội của Đảng Cộng sản Việt Nam và Nhà nước ta.</li> </ul>	Chương 3	Thuyết trình nhóm (GHW) Thi giữa kỳ (Quiz) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Đề thi của GV Ngân hàng đề thi của khoa Chính trị - Hành chính
LO.4	<ul style="list-style-type: none"> <li>- Nắm rõ nội dung tư tưởng Hồ Chí Minh về Đảng Cộng sản Việt nam và Nhà nước của dân, do dân, vì dân.</li> <li>- Hiểu được sự vận dụng của Đảng và Nhà nước ta vào công tác xây dựng Đảng và xây dựng Nhà nước.</li> </ul>	Chương 4	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính
LO.5	<ul style="list-style-type: none"> <li>- Nắm được nội dung tư tưởng Hồ Chí Minh về đại đoàn kết toàn dân tộc và đoàn kết quốc tế.</li> <li>- Hiểu được sự vận dụng của Đảng và Nhà nước ta trong việc hoạch định chủ trương, đường lối, chính sách về đại đoàn kết dân tộc và đối ngoại.</li> </ul>	Chương 5	Thuyết trình nhóm (GHW) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm Ngân hàng đề thi của khoa Chính trị - Hành chính

LO.6	<p>- Nắm được nội dung tư tưởng Hồ Chí Minh về văn hóa, đạo đức, con người.</p> <p>- Vận dụng tư tưởng Hồ Chí Minh về văn hóa, đạo đức và con người trong việc rèn luyện, tu dưỡng bản thân.</p>	Chương 6	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>	<p>Tiêu chí đánh giá thuyết trình nhóm</p> <p>Ngân hàng đề thi của khoa Chính trị - Hành chính</p>
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### 9. Một số lưu ý khác:

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

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

**Course Name: Data Science and Visualization**  
**Course Code: IT138IU**

**1. General information**

Course designation	Data Science and Data Visualization
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 / specialisation Names of other study programmes with which 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	Introduction to Data Science and Data Analysis
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.

		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																																								
		Knowledge	CLO1																																								
		Skill	CLO2, CLO3																																								
		Attitude	CLO3																																								
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	[6] Cole Nussbaumer Knaflic, Storytelling with Data: A Data Visualization Guide for Business Professionals 1st, 2015
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## 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	X	X				
2		X	X			
3		X				

## 3. Planned learning activities and teaching methods

Week	Topic	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	
<b>6</b>	<b>Midterm</b>				
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	

Week	Topic	CLO	Assessments	Learning activities	Resources
14	Final exam				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)		x	x
Midterm examination (30%)	x	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.

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

##### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

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

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

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

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

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

	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.	presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation understandable , and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.

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



**Nguyen Van Sinh**

**Course Name: Data Analysis**  
**Course Code: IT137IU**

**1. General information**

Course designation	Data analysis is a process of inspecting, cleansing, transforming, and modelling data with the goal of discovering useful information, informing conclusions, and supporting decision-making.
Semester(s) in which the course is taught	3,5
Person responsible for the course	Nguyen Thi Thanh Sang, Dr.
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	Introduction to Data Science
Course objectives	This course introduces fundamentals of data analysis by learning data analysis process together with descriptive statistics and inferential statistics. Students will study how to collect data, process and turn them into useful information and knowledge which are important to decision making. From raw data to useful information then to knowledge, students will examine a number of datasets and case studies from different perspectives. Students are able to develop practical solutions to problems in business and engineering, and gain hands-on experience of using contemporary data analysis tools.
Course learning outcomes	CLO 1. Understand fundamental concepts of data analysis.  CLO 2. Explain how to perform data analysis with descriptive statistics and inferential statistics.

	CLO 3. Apply data analysis techniques and tools to some practical cases in business/engineering.																																				
	<table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO1</td></tr> <tr> <td>Skill</td><td>CLO2, CLO3</td></tr> <tr> <td>Attitude</td><td>CLO3</td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1	Skill	CLO2, CLO3	Attitude	CLO3																												
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Reading list	<ol style="list-style-type: none"> <li>1. Anil Maheshwari, Data Analytics, 2022</li> <li>2. Migrant &amp; Seasonal Head Start Technical Assistance Center. Introduction to Data Analysis Handbook, non-commercial uses only.</li> </ol>																																				

## 2. Learning Outcomes Matrix (optional)

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	XX					
2	X				X	
3						X

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Data, data analysis process and business decisions	1	Quiz	Lecture	[1,2]
2	Data analysis roles	2	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
3	Data Ecosystem and Languages for Data Professionals	2	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
4	Data Repositories and Big data Platforms	2	Quiz, Midterm, Project	Lecture, Discussion, In-class, exercise	[1,2]
5	Gathering Data	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]
6	<b>Midterm</b>				
7	Wrangling Data	2	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]
8	Analyzing and Data Mining	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1,2]
9	Communication Data Analysis Finding	3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1,2]
10	Exploratory Data Analysis	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1,2]
11	Customer relationship management	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]

Week	Topic	CLO	Assessments	Learning activities	Resources
12	Personalization	2,3	Project, Final, Quiz, Lab	Lecture, Discussion, In-class, exercise	[1]
13	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (10%)			100%
Midterm examination (25%)	50%	50%	
Final examination (40%)		50%	50%
Exercises/ Quiz (5%)	100%		
Projects/Presentations/ Report (20%)	30%	30%	40%

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

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a</i>	Information is taken from source(s) with enough interpretation/	Information is taken from source(s) with enough interpretation/	Information is taken from source(s) with some interpretation/	Information is taken from source(s) without any interpretation/

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

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

Source: Association of American Colleges and Universities

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

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

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation understandable , and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports 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

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

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

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



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	Nguyen Thi Thanh Sang, Dr.								
Language	English								
Relation to curriculum	Elective								
Teaching methods	Lecture, lesson, project, 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	<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;">Competency level</th> <th style="text-align: center;">Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Knowledge</td> <td>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.</td> </tr> <tr> <td style="text-align: center;">Skill</td> <td>CLO 3. Apply data mining techniques to some case studies using existing datasets.</td> </tr> <tr> <td style="text-align: center;">Attitude</td> <td>CLO 4. Work in a team to build a data mining process.</td> </tr> </tbody> </table>	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 build a data mining process.
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 build a data mining process.								

Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>		
	<b>Topic</b>	<b>Weig ht</b>	<b>Lev el</b>
	Introduction	1	I
	Know your data	1	T, U
	Data preprocessing	1	T, U
	Data mining knowledge representation	1	T, U
	Evaluating what's been learned	1	T
	Data mining algorithms: Classification	2	T, U
	Mining Frequent Patterns, Association and Correlations: Basic Concept and Methods	2	T
	Data mining algorithms: Clustering	2	T
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>		
Reading list	<p>[1] Jiawei Han, Micheline Kamber, <i>Data Mining: Concepts and Techniques</i>, 3<sup>rd</sup> Edition, 2011.</p> <p>[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.</p> <p>[3] A. Lawrynowicz, <i>Semantic Data Mining: An Ontology-based Approach (Studies on the Semantic Web)</i>, IOS Press (April 15, 2017), ISBN-10 1614997454.</p>		

## 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:

<b>CLO</b>	<b>SLO</b>					
	1	2	3	4	5	6
1	x					
2	x					
3						x

4					x	
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### 3. Planned learning activities and teaching methods

Wee k	Topic	CL O	Assessmen ts	Learning activities	Resources
1	Introduction	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	<b>Midterm</b>				
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	<b>Final exam</b>				

### Laboratory

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	CLO 1	CLO 2	CLO 3	CLO 4
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: .....	Evaluator: .....
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

##### 5.2. Holistic rubric

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

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

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

### 5.3. Analytic rubric

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

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

	questioned thoroughly.	subject to questioning.	experts are taken as mostly fact, with little questioning.	
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective , thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and	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 is inconsistently tied to some of the information discussed; related

	ability to place evidence and perspectives discussed in priority order.	related outcomes (consequences and implications) are identified clearly.	conclusion); some related outcomes (consequences and implications) are identified clearly.	outcomes (consequences and implications) are oversimplified.
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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**



**Nguyen Van Sinh**

**Course Name: Scalable and Distributed Computing****Course Code: IT139IU****1. General information**

Course designation	Fundamental concepts in distributed computing and discuss system designs enabling distributed applications
Semester(s) in which the course is taught	5,7
Person responsible for the course	Assoc. Prof. Vo Thi Luu Phuong
Language	English
Relation to curriculum	Compulsory (NE, 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	Algorithms and Data Structure
Course objectives	This course presents the theory, design, implementation, and analysis of distributed systems. Through classroom lectures, labs, projects and exercises, students learn the fundamentals of distributed systems, system models, remote procedure call, distributed objects, operating system support, security in distributed systems, distributed file systems, concurrency, transaction and synchronization, replication. The course also covers advanced topics related to cloud and distributed data processing technologies: data partitioning, storage schemes, stream processing, and parallel algorithms. Course introduces some modern Internet and cloud computing services running on multiple geographically distributed data centers: Google, Yahoo, Facebook, iTunes, Amazon, eBay, Bing, etc.
Course learning outcomes	CLO 1. Understand the concept and design of distributed systems CLO 2. Apply distributed data processing models and technologies

	<p>CLO 3. Communicate to the team to design the data pipeline that can be integrated with distributed system,  CLO 4. Design and implement components of a scalable and distributed system (millions of users and petabytes of data)</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th><th><b>Course learning outcome (CLO)</b></th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr> <tr> <td>Skill</td><td>CLO 2, CLO 4</td></tr> <tr> <td>Attitude</td><td>CLO 3</td></tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	Knowledge	CLO 1, CLO 2, CLO 3, CLO 4	Skill	CLO 2, CLO 4	Attitude	CLO 3																																					
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<b>Topic</b>	<b>Weigh t</b>	<b>Leve l</b>																																												
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Examination forms	Multiple-choice questions, short-answer questions																																													
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																													

Reading list	3. G. Coulouris, J. Dollimore, T. Kindberg, G. Blair, Distributed Systems: Concepts and Design 5th, 2011 4. T. White, Hadoop: The Definitive Guide 4th, 2015 5. A.S. Tanenbaum, M.V. Steen, Distributed Systems: Principles and Paradigms 2nd, 2007
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## 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 O	1	2	3	4	5	6
1	x					
2	x	x				
3	x	x				x
4		x				x

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Distributed Systems, System Models	1		Lecture, Discussion	[1,2,3] Chapter 1
2	Remote Procedure Call, Distributed Objects	1	Exercises	Lecture, In-class exercises	[1,3] Chapter 2
3	Operating System Support, Distributed File Systems	1	Exercises	Lecture, In-class exercises	[1,3] Chapter 3
4	Transaction and Synchronization	1,2	Labs	Lecture, In-class exercises	[1,3] Chapter 3,4
5	Concurrency Control	1,2	Labs	Lecture, In-class exercises	[1,3] Chapter 5,6
6	Midterm				
7	Security	2,3	Exercises	Lecture, In-class exercises	[1,3] Chapter 6,7
8	Fault and Failure	2,3	Labs	Lecture, In-class exercises	[2] Chapter 5
9	Introduction to MapReduce	2,3	Exercises	Lecture, In-class exercises	[2] Chapter 6,7

10	Scalable K-means algorithms	2,3	Labs	Lecture, In-class exercises	Outside resources
11	Graph and Random-walk algorithms	2,3	Exercises	Lecture, In-class exercises	Outside resources
12	Web services, XML, JSON, Node.js	3,4	Labs	Lecture, In-class exercises	[1,3] Chapter 9,10,11
13	Peer-to-Peer	3,4	Labs	Lecture, In-class exercises	[1,3] Chapter 12
14	Selected seminar 1: Introduce some distributed pipeline in Industry.	4		Discussion	Outside resources
15	Selected seminar 2: Introduce some scalable and distributed products used in Industry.	4		Discussion	Outside resources
16	Revision			Review-test	
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Labs (20%)		50%	50%
Midterm examination (30%)	50%	50%	
Final examination (40%)	20%	50%	30%
Exercises/ Quiz (10%)	50%	50%	

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 organization of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted. ↵

#### 5. Rubrics (optional)

##### 5.4. Grading checklist

Grading checklist for Written Reports			
Student: .....	HW/Assignment: .....		
Date: .....	Evaluator: .....		
	Max.	Score	Comments
<b>Technical content (60%)</b>			

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

### 5.5. 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	Milestone		Benchmark
	4	3	2	1
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant	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	Issue/ problem to be considered critically is stated without clarification or description.

	information necessary for full understanding.	impeded by omissions.	undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
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<b>Student's position (perspective , thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

Source: Association of American Colleges and Universities

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

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

	consistently observable and is skillful and makes the content of the presentation cohesive.	clearly and consistently observable within the presentation.	intermittently observable within the presentation.	within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or

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

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

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

  
**Nguyen Van Sinh**

**Course Name: Machine Learning****Course Code: IT172IU****1. General information**

Course designation	This course intends to give student an overview on machine learning; fundamental knowledge & popular machine learning algorithms; and its application.
Semester(s) in which the course is taught	6, 8
Person responsible for the course	Mai Hoang Bao An, PhD.
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	Fundamentals of Programming, OOP Linear Algebra
Course objectives	The goal of this course is to equip students with the understanding, knowledge, and some sorts of practical skills to develop many Machine Learning models with the goal to focus on application. In this course, we emphasize on a class of popular Machine Learning methods in Classification, Regression, Clustering, and Time Series Analysis. Also, we attempt to introduce a list of potential tools that can help students play around with different Advanced Machine Learning techniques. So that, the general goal of this course is to provide students the Machine Learning techniques broadly, not

	deeply, and the contents are most likely application-based approach.																																				
Course learning outcomes	<p>CLO 1. gain understanding of machine learning in general and its applications.</p> <p>CLO 2. can practice with some popular machine learning algorithms at a basic level.</p> <p>CLO 3. can understand and reproduce different machine learning use cases based on popular platforms.</p> <p>CLO 4. learn how to select and use machine learning algorithms with a bunch of application.</p>																																				
	<table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr> <tr> <td>Skill</td><td>CLO 3, CLO 4</td></tr> <tr> <td>Attitude</td><td>CLO 3, CLO 4</td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO 1, CLO 2, CLO 3, CLO 4	Skill	CLO 3, CLO 4	Attitude	CLO 3, CLO 4																												
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>																																				
	<table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Why is Machine Learning important?</td><td>1</td><td>I</td></tr> <tr> <td>History of Machine Learning</td><td></td><td></td></tr> <tr> <td>Introduction to Google Cloud and the use of Colab.</td><td>1</td><td>I, U</td></tr> <tr> <td>Fundamentals of Machine Learning and data pipeline</td><td>1</td><td>T, U</td></tr> <tr> <td>Linear and Logistic Regression/Classification</td><td>1</td><td>T, U</td></tr> <tr> <td>Gradient descent methods.</td><td>1</td><td>T, U</td></tr> <tr> <td>MLP for Classification and Regression, Regression with Regularization</td><td>1</td><td>T, U</td></tr> <tr> <td>Support Vector Machine and Kernel Methods.</td><td>1</td><td>T, U</td></tr> <tr> <td>Multi-class Classification, Probabilistic Classifiers</td><td>1</td><td>T, U</td></tr> <tr> <td>Neural Networks</td><td>1</td><td>T, U</td></tr> <tr> <td>Introduction to ensemble learning and popular algorithms</td><td>2</td><td>T, U</td></tr> </tbody> </table>	Topic	Weight	Level	Why is Machine Learning important?	1	I	History of Machine Learning			Introduction to Google Cloud and the use of Colab.	1	I, U	Fundamentals of Machine Learning and data pipeline	1	T, U	Linear and Logistic Regression/Classification	1	T, U	Gradient descent methods.	1	T, U	MLP for Classification and Regression, Regression with Regularization	1	T, U	Support Vector Machine and Kernel Methods.	1	T, U	Multi-class Classification, Probabilistic Classifiers	1	T, U	Neural Networks	1	T, U	Introduction to ensemble learning and popular algorithms	2	T, U
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	Time Series Analytics based on Machine Learning	1	I, T
	Clusstering, Mixture of Gaussians	1	T, U
	PCA and Introduction to feature engineering.	1	T, U
	Practical session: Focused discussion on a bunch of problems.	1	I, U
Examination forms	short-answer questions, long-answer questions, projects.		
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] Jerome H. Friedman, Robert Tibshirani, and Trevor Hastie., The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition (Springer Series in Statistics). [2] Christopher M. Bishop., Pattern Recognition and Machine Learning (Information Science and Statistics). [3] Kevin P. Murphy., Machine Learning: A Probabilistic Perspective (Adaptive Computation and Machine Learning series). [4] Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.		

## 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	X					
2	X				X	
3			X	X		X
4		X				

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Why is Machine Learning important?	1		Lecture, Discussion	[2,4] Chapter 1

Week	Topic	CLO	Assessments	Learning activities	Resources
	History of Machine Learning				
2	Introduction to Google Cloud and the use of Colab.	1, 2	Exercises	Lecture, In-class exercises	[3] Chapter 1
3	Fundamentals of Machine Learning and data pipeline	1, 2	Exercises, lab	Lecture, In-class exercises	[4] Chapter 2, 3
4	Linear and Logistic Regression/Classification	2, 3	Exercises, lab	Lecture, In-class exercises	[4] Chapter 4, 5
5	Gradient descent methods.	2, 3	Exercises, lab	Lecture, In-class exercises	[2,3] Chapter 5,6
6	MLP for Classification and Regression, Regression with Regularization	2, 3	Exercises, lab	Lecture, In-class exercises	[2] Chapter 7, 8
7	Support Vector Machine and Kernel Methods.	2, 3	Exercises, lab	Lecture, In-class exercises	[1] Chapter 5, 6
8	Multi-class Classification, Probabilistic Classifiers	2, 3	Exercises, lab	Lecture, In-class exercises	[1] Chapter 2, 3, 4
9	Neural Networks	2, 3			
<b>10</b>	<b>Midterm</b>				
11-12	Introduction to ensemble learning and popular algorithms	2, 3	Exercises, lab	Lecture, In-class exercises	[3] Chapter 1, 2, 3
13	Time Series Analytics based on Machine Learning	2, 3	Exercises, lab	Lecture, In-class exercises	[1,2,3] Chapter 4, 5, 6
14	Clusstering, Mixture of Gaussians	3, 4	Exercises, lab	Lecture, In-class exercises	[1,3] Chapter 6, 7, 8
15	PCA and Introduction to feature engineering.	3, 4	Lab	Lecture, In-class exercises	[1,2,3] Chapter 4, 5, 6
16	Practical session: Focused discussion on a bunch of problems.	4	Seminar	Lecture, In-class exercises	[3] Chapter 6, 7, 8

Wee k	Topic	CLO	Assessment s	Learning activities	Resources
17	Final exam				

#### 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%

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: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			

Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

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

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

Source: Association of American Colleges and Universities

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

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

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

*Source: Association of American Colleges and Universities*

**Date revised: February 15, 2022**

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



**Nguyen Van Sinh**

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

**1. Thông tin chung**

Tên môn học (tiếng Việt):	Chủ nghĩa xã hội khoa học
Tên môn học (tiếng Anh):	Scientific socialism
Mã số môn học:	PE017IU
Thuộc khối kiến thức:	Cơ sở
Số tín chỉ:	2
Số tiết lý thuyết:	30 (trên lớp)
Số tiết thực	
Số tiết tự học:	60 (về nhà)
Môn học trước:	1. Kinh tế chính trị Mác - Lê nin, 2. Triết học Mác - Lê nin
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 - Lê nin).
- 2.2. Giúp cho sinh viên vận dụng những tri thức cơ bản của chủ nghĩa xã hội khoa học một cách sáng tạo trong hoạt động nhận thức và thực tiễn, nhằm giải quyết những vấn đề mà đời sống xã hội của đất nước, của thời đại đang đặt ra.

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

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

**4. Tài liệu phục vụ học tập:**

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

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

		thái kinh tế - xã hội công sản chủ nghĩa				
		LO.3.2 – Trình bày được những đặc trưng cơ bản của chủ nghĩa xã hội	2.1	1.1.3	I3	
		LO.3.3 – Giải thích được tính tất yếu khách quan của thời kỳ quá độ lên chủ nghĩa xã hội và những đặc điểm cơ bản của thời kỳ quá độ lên chủ nghĩa xã hội				
		LO.3.4 – Hiểu rõ đặc trưng của thời kỳ quá độ và chủ nghĩa xã hội ở Việt Nam, trình bày được những phương hướng xây dựng chủ nghĩa xã hội ở Việt Nam hiện nay				
LO.4	DÂN CHỦ XÃ HỘI CHỦ NGHĨA VÀ NHÀ NƯỚC XÃ HỘI CHỦ NGHĨA	LO.4.1 – Giải thích được quan niệm về dân chủ và sự ra đời và phát triển dân chủ trong lịch sử xã hội loài người	2.1			
		LO.4.2 – Nắm rõ quá trình ra đời và bản chất của nền dân chủ xã hội chủ nghĩa	2.1			
		LO.4.3 – Hiểu được sự ra đời, bản chất và chức năng của nhà nước xã hội chủ nghĩa cũng như mối quan hệ giữa dân chủ và nhà nước	2.1	1.1.3	T4	
		LO.4.4 - hiểu được sự ra đời phát triển và bản chất của nền dân chủ xã hội chủ nghĩa ở Việt Nam	2.1 2.2			
		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	CƠ CẤU XÃ HỘI GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG	LO.5.1 – Trình bày được khái niệm cơ cấu xã hội – khái quát và sự biến đổi của cơ cấu xã hội giai cấp trong thời kì quá độ lên chủ nghĩa xã hội				
		LO.5.2 – giải thích được tính tất yếu của liên minh giai cấp, tầng trong thời kỳ quá độ lên chủ nghĩa xã hội	2.1	1.1.3	I3	

	LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.5.3 – Hiểu rõ cơ cấu xã hội – giai cấp ở Việt Nam trong thời kì quá độ và trình bày những giải pháp cơ bản nhằm xây dựng, phát triển lối liên minh giai cấp, tầng lớp xã hội ở Việt Nam			
LO.6	VĂN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	<p>LO.6.1 – Hiểu rõ khái niệm, đặc trưng cơ bản của dân tộc và quan điểm của chủ nghĩa Mác – Leenin về vấn đề dân tộc</p> <p>LO.6.2 – Trình bày được những đặc điểm cơ bản của dân tộc ở Việt Nam và quan điểm chính sách dân tộc của Đảng và Nhà nước Việt Nam</p> <p>LO.6.3 – Hiểu được bản chất, nguồn gốc, tính chất của tôn giáo và nguyên tắc cơ bản giải quyết vấn đề tôn giáo trong thời kỳ quá độ lên chủ nghĩa xã hội</p> <p>LO.6.4 – Giải thích được những đặc điểm tôn giáo ở Việt Nam và chính sách của Đảng và Nhà nước Việt Nam đối với tín ngưỡng tôn giáo hiện nay</p> <p>LO.6.5 – Hiểu rõ được đặc điểm quan hệ dân tộc và tôn giáo ở Việt Nam và trình bày được các định hướng cơ bản nhằm giải quyết mối quan hệ giữa dân tộc và tôn giáo ở Việt Nam hiện nay</p>	2.1 2.1 2.1 2.1 2.2 2.1 2.2	1.1.3	T4
LO.7	VĂN ĐỀ GIA ĐÌNH TRONG THỜI KỲ	<p>LO.7.1 – Khái lược được vị trí, chức năng và vai trò của gia đình trong xã hội</p> <p>LO.7.2 – Nhận biết được các cơ sở xây dựng gia đình trong thời kỳ quá độ lên chủ nghĩa xã hội</p>	2.1	1.1.3	I3

	QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI	LO.7.3 – Giải thích được sự biến đổi của gia đình Việt Nam trong thời kỳ quá độ và trình bày được những phương hướng cơ bản xây dựng và phát triển gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội			
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### 5.2. Kỹ năng

LO.8	THỂ HIỆN KHẢ NĂNG KHÁI QUÁT HÓA, TƯ DUY, TRANG LUẬN, PHẢN BIỆN, LÀM VIỆC NHÓM	LO.8.1 – Có kỹ năng khái quát hóa để rút ra <i>Từ khóa trí thức</i> đối với mỗi nội dung và tư duy vỏ hệ thống	2.1 2.2	2.1.1 2.3.1	U4
		LO.8.2 – Có kỹ năng trình bày, thuyết minh, phản biện, tranh luận, hùng biện những tri thức lý luận đang học tập, nghiên cứu dựa trên thực tiễn		2.4.4	
		LO.8.3 – Có kỹ năng giao tiếp xã hội, hợp tác và làm việc nhóm, chia sẻ tri thức và kinh nghiệm, khả năng điều hành nhóm làm việc		2.5 3.1.5	
LO.9	THỂ HIỆN Ý THỨC NHẬN THÚC TRONG VÀ SAU KHI HỌC TẬP	LO.9.1 – Có ý thức trách nhiệm bảo vệ tính khoa học, cách mạng trong lý luận của chủ nghĩa Mác – Leenin về CNXH và con đường đi lên CNXH ở Việt Nam	2.1 2.2	3.1	U3
		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 (tiết)	Nội dung giảng dạy	LO	Hoạt động dạy và học	Đánh giá
1 (tiết 1)	Giới thiệu về môn học	LO.1 LO.4	<p><b>Dạy:</b></p> <ul style="list-style-type: none"> <li>- Giới thiệu đề cương môn học</li> <li>- Giới thiệu nội dung đề tài thuyết trình nhóm (GHW)</li> </ul> <p><b>Học ở lớp:</b></p> <ul style="list-style-type: none"> <li>- Chia nhóm (5 SV/nhóm)</li> <li>- Giới thiệu nhóm học tập</li> </ul> <p><b>Học ngoài lớp:</b></p> <ul style="list-style-type: none"> <li>- Chọn đề tài thuyết trình của nhóm (GHW)</li> <li>- Đọc trước tài liệu chương 1.</li> </ul>	
2	<p style="text-align: center;"><b>Chương 1</b></p> <p style="text-align: center;"><b>NHẬP MÔN CHỦ NGHĨA XÃ HỘI KHOA HỌC</b></p>		<p><b>Dạy:</b></p> <p>1.SỰ RA ĐỜI CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌC</p> <p>1.1. Hoàn cảnh lịch sử sự ra đời của chủ nghĩa xã hội khoa học</p> <p>1.2. Vai trò của C. Mác và Ăngghen</p> <p>2.CÁC GIAI ĐOẠN PHÁT TRIỂN CƠ BẢN CỦA CHỦ NGHĨA XÃ HỘI KHOA HỌC</p> <p>2.1. C. Mác và Ph.Ăngghen phát triển chủ nghĩa xã hội khoa học</p> <p>2.2. V.I.Lênin vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học trong điều kiện mới</p> <p>2.3. Sự vận dụng và phát triển sáng tạo chủ nghĩa xã hội khoa học từ sau khi lenin qua đời đến nay</p> <p>3. ĐỐI TƯỢNG, PHƯƠNG PHÁP VÀ Ý NGHĨA CỦA VIỆC NGHIÊN CỨU CHỦ NGHĨA XÃ HỘI KHOA HỌC</p> <p>3.1. Đối tượng nghiên cứu của chủ nghĩa xã hội khoa học</p> <p>3.2. Phương pháp nghiên cứu của chủ nghĩa xã hội khoa học</p> <p>Ý nghĩa của việc nghiên cứu chủ nghĩa xã hội khoa học</p>	Thi giữa kì (Quiz)

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

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

6	<p><b>Chương 5</b>  <b>CƠ CẤU XÃ HỘI – GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</b></p>	<p>LO.3 LO.4 LO.5</p>	<p><b>Dạy:</b></p> <p>1. CƠ CẤU XÃ HỘI GIAI CẤP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p> <p>1.1. Khái niệm và vị trí của cơ cấu xã hội - giai cấp trong cơ cấu xã hội</p> <p>1.2. Sự biến đổi có tính quy luật của cơ cấu xã hội - giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội</p> <p>2. LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p> <p>3. CƠ CẤU XÃ HỘI - GIAI CẤP VÀ LIÊN MINH GIAI CẤP, TẦNG LỚP TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI Ở VIỆT NAM</p> <p>3.1. Cơ cấu xã hội - giai cấp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam</p> <p>3.2. Liên minh giai cấp, tầng lớp trong thời kỳ quá độ lên chủ nghĩa xã hội ở Việt Nam</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 6</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>
7	<p><b>Chương 6</b>  <b>VĂN ĐỀ DÂN TỘC VÀ TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</b></p>	<p>LO.2 LO.4 LO.5</p>	<p><b>Dạy:</b></p> <p>1. DÂN TỘC TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p> <p>1.1. Chủ nghĩa Mác - Lê nin về dân tộc</p> <p>1.2. Dân tộc và quan hệ dân tộc ở Việt Nam</p> <p>2. TÔN GIÁO TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p> <p>2.1. Chủ nghĩa Mác - Lê nin về tôn giáo</p> <p>2.2. Tôn giáo ở Việt Nam và chính sách tôn giáo của Đảng, Nhà nước ta hiện nay</p> <p>3. QUAN HỆ DÂN TỘC VÀ TÔN GIÁO Ở VIỆT NAM</p> <p>3.1. Đặc điểm quan hệ dân tộc và tôn giáo ở Việt Nam</p> <p>3.2. Định hướng giải quyết mối quan hệ dân tộc và tôn giáo ở Việt Nam hiện nay</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>

			<p>3.3. Phương hướng và một số giải pháp chủ yếu để xây dựng giai cấp công nhân Việt Nam hiện nay</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Đọc trước tài liệu chương 7</p>	
8	<p><b>Chương 7</b> VÂN ĐỀ GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p>		<p><b>Dạy:</b></p> <p>1. KHÁI NIỆM, VỊ TRÍ VÀ CHỨC NĂNG CỦA GIA ĐÌNH</p> <p>1.1. Khái niệm gia đình</p> <p>1.2. Vị trí của gia đình trong xã hội</p> <p>1.3. Chức năng cơ bản của gia đình</p> <p>2. CƠ SỞ XÂY DỰNG GIA ĐÌNH TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p> <p>2.1. Cơ sở kinh tế - xã hội</p> <p>2.2. Cơ sở chính trị - xã hội</p> <p>2.3. Cơ sở văn hóa</p> <p>3. XÂY DỰNG GIA ĐÌNH VIỆT NAM TRONG THỜI KỲ QUÁ ĐỘ LÊN CHỦ NGHĨA XÃ HỘI</p> <p>3.1. Sự biến đổi gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội</p> <p>3.2. Phương hướng cơ bản xây dựng và phát triển gia đình Việt Nam trong thời kỳ quá độ lên chủ nghĩa xã hội</p> <p><b>Học ở lớp:</b> Thảo luận và phát biểu trên lớp</p> <p><b>Học ngoài lớp:</b> Hoàn thiện bài thuyết trình</p>	<p>Thuyết trình nhóm (GHW)</p> <p>Thi cuối kỳ (FEX)</p>

## 7. Đánh giá môn học

ST T	Mã	Tên	Mô tả	Tỷ trọng	Hình thức	LO
1	GHW	Thuyết trình nhóm	Thuyết trình nhóm về đề tài đã phân công	15%	Thuyết trình và bản báo cáo nhóm	LO.3 LO.4 LO.5 LO.6 LO.7
2	Quiz	Bài thi giữa kì	Thi theo đề thi của GV	20%	Tự luận đề mở	LO.1 LO.2 LO.3

3	DIC	Thảo luận, chuyên cần tại lớp (Discussion in Class)	Điểm thảo luận được tính theo phương pháp tương đối. SV có số lần thảo luận tại lớp nhiều nhất sẽ được điểm tối đa, điểm của các bạn khác được tính dựa theo bạn có số lần	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
		<b>Tổng cộng</b>		<b>100%</b>		

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

TT	Chuẩn đầu ra	Nội dung	Phương pháp	Tiêu chí đánh giá
LO.1	Nhận biết 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 - Lê nin về giai cấp công nhân, nội dung, biểu hiện và ý nghĩa của sứ mệnh đó trong bối cảnh hiện nay	Chương 2	Thi giữa kỳ (Quiz)	Ngân hàng đề thi của GV
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - lénin 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

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 đề thi của Khoa
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - Lê nin về dân tộc, tôn giáo, mối quan hệ giữa dân tộc và tôn giáo, tầm quan trọng của vấn đề dân tộc, tôn giáo và nội dung chính sách dân tộc, tôn giáo của Đảng và Nhà nước Việt Nam	Chương 6	Thảo luận tại lớp (Discussion in Class), Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của Khoa
LO.3 LO.4	Nhận biết và nắm được những quan điểm cơ bản của chủ nghĩa Mác - Lê nin, tư tưởng Hồ Chí Minh và Đảng Cộng sản Việt Nam về gia đình, xây dựng gia đình trong thời kỳ quá độ lên chủ nghĩa xã hội hiện nay.	Chương 7	Thảo luận tại lớp (Discussion in Class) Thi cuối kỳ (FEX)	Tiêu chí đánh giá thuyết trình nhóm, thảo luận tại lớp Ngân hàng đề thi của Khoa

## 9. Một số lưu ý khác:

- Khi có các thắc mắc liên quan môn học, sinh viên có thể liên lạc với quản lý Bộ môn Hồ Chí Minh học & Lịch sử Đảng và Khoa Chính trị - Hành chính qua email: [daotao.spas@vnuhcm.edu.vn](mailto:daotao.spas@vnuhcm.edu.vn)
- Quy định về Bài thuyết trình nhóm GHW
  - + Thành lập nhóm: 5 sinh viên/nhóm. Hạn chót đăng ký đề tài nhóm Quản lý trên forum là Buổi 2 hoặc trực tiếp nộp cho GV buổi 1.
  - + Giảng dạy kết thúc chương 3, các nhóm thuyết trình theo thứ tự. Lưu ý các nhóm cần có mặt đủ và mang theo tất cả các tài liệu liên quan đến GHW khi đi thuyết trình
  - + Hình thức nộp bài: Nộp file và biên bản làm việc nhóm qua mail cho GV
- Quy định về giờ giấc, chuyên cần, kỷ luật trong khóa học: Lên lớp đúng giờ, dự tối thiểu 80% thời gian học trên lớp (chỉ được phép vắng mặt tối đa 20% số tiết học). Nếu vắng quá số tiết quy định sẽ bị cấm thi theo quy chế. Có đầy đủ điểm kiểm tra, điểm thi kết thúc học phần và nhiệt tình thảo luận, phát biểu xây dựng bài, nghiêm túc trong giờ học.

**Course Name: Deep Learning****Course Code: IT157IU****6. 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	Fundamental of Programming Calculus 1
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:

	<p>Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN).</p> <p>CLO 3. Build, train, and deploy different types of Deep Architectures from traditional to modern Architectures.</p> <p>CLO 4. Understand and be able to apply deep learning techniques to real-world scenarios: Computer Vision, Natural Language Processing.</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th><th><b>Course learning outcome (CLO)</b></th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO 1, CLO 2, CLO 3, CLO 4</td></tr> <tr> <td>Skill</td><td>CLO 3, CLO 4</td></tr> <tr> <td>Attitude</td><td>CLO 3, CLO 4</td></tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	Knowledge	CLO 1, CLO 2, CLO 3, CLO 4	Skill	CLO 3, CLO 4	Attitude	CLO 3, CLO 4																			
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	<ul style="list-style-type: none"> <li>- Residual Neural Network (Resnet)</li> <li>- MobileNet</li> </ul>			
	<p>Modern RNN:</p> <ul style="list-style-type: none"> <li>- Gated Recurrent Units (GRU)</li> <li>- Long Short-Term Memory (LSTM)</li> <li>- Bidirectional RNN</li> <li>- Encoder-Decoder Architecture</li> </ul>	2	T, U	
	<p>Optimization Algorithms used in Deep Learning</p>	1	I, T	
	<p>Generative Adversarial Network (GAN) &amp; Deep Convolution GAN</p>	1	T, U	
	<p>Deep Learning in Computer Vision</p>	1	T, U	
	<p>Deep Learning in Natural Language Processing</p>	1	T, U	
Examination forms	Short-answer questions, Long-answer questions, programming questions			
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>			
Reading list	<p>[1] Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, The MIT Press 2021, ISBN: 978-0262035613.</p> <p>[2] Aston Zhang, Zachary C. Lipton, Mu Li, and Alexander J. Smola., Dive Into Deep Learning.</p>			

## 7. 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	x					
2		x	x			
3			x	x		x
4				x		x

## 8. Planned learning activities and teaching methods

Wee k	Topic	CL O	Assessments	Learning activities	Resource s
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
<b>10</b>	<b>Midterm</b>				
11-12	Modern RNN: - Gated Recurrent Units (GRU)	2, 3	Exercises	Lecture, In-class exercises	[2] Chapter 10

	- Long Short-Term Memory (LSTM) - Bidirectional RNN - Encoder-Decoder Architecture				
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	<b>Final exam</b>				

## 9. 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%

## 10. Rubrics (optional)

### 5.4. Grading checklist

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

Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

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

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

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

Source: Association of American Colleges and Universities

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

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

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated,	Central message is clear and consistent with	Central message is basically understandable	Central message can be deduced but is not

appropriately repeated, memorable, and strongly supported.)	the supporting material.	but is not often repeated and is not memorable.	explicitly stated in the presentation.
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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**



**Nguyen Van Sinh**

**Course Name: Business Process Analysis**  
**Course Code: IT144IU**

**1. General information**

Course designation	The course aims to provide fundamental knowledge of business process analysis, improvement and evaluation.
Semester(s) in which the course is	7
Person responsible for the course	Assof. Pror.Dr. Vo Thi Luu Phuong
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	Total workload: Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 195 hours. Lecture: 45 hours. Lab: 30 hours. Private study including examination preparation, specified in 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	None
Course objectives	Every organization thrives to implement effective business processes to increase employee and customer satisfaction, enhance business performance, reduce costs and boost productivity. All activities including altering critical processes, merging or splitting business units require a consistent framework to manage the changes. The course aims to provide fundamental knowledge of business process analysis, improvement and evaluation. Various approaches, techniques and software tools used to analyze and manage business process improvement are also introduced in the course.
Course learning outcomes	CLO 1. Practice the Framework for Process Improvement CLO 2. Identify and analyze an organization's business process using different techniques such as ANSI, Swim

	<p>Lane, Business Process Diagrams, UML, SIPOC, and Value Stream Maps CLO 3. Evaluate process improvement effectiveness</p> <table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>1, 2, 3</td></tr> <tr> <td>Skill</td><td>1, 3</td></tr> <tr> <td>Attitude</td><td></td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	1, 2, 3	Skill	1, 3	Attitude														
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ional Support nclusions	1	I																				
Examination forms	Multiple-choice questions, short-answer questions																					
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged. Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																					
Reading list																						

## 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		X			X	
2		X				
3		X	X			

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Data Science in Action	2	Midterm	In-class activities	
2	Process Models and Process Discovery	2, 5	Midterm, Quiz, Project, Lab	In-class activities, quiz	
3	<b>Midterm</b>				
4	Different Types of Process Models	2	Final, Project, Lab	In-class activities	
5	Process Discovery Techniques and Conformance Checking	2, 3	Final, Project, Quiz, Lab	In-class activities, Quiz	
6	Enrichment of Process Models	2	Final, Project, Lab	In-class activities	
7	Operational Support and Conclusions	2	Final, Project, Lab	In-class activities	
8	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (20%)	20%	20%	
Midterm examination (30%)	50%	40%	
Final examination (40%)		20%	60%
Exercises/ Quiz/ Project (10%)	30%	20%	40%

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

<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

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

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

Source: Association of American Colleges and Universities

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

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

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or	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	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	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/

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

*Source: Association of American Colleges and Universities*

**Date revised: February 15, 2022**

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

**Nguyen Van Sinh**

**Course Name: Decision support systems****Course Code: IT145IU****1. General information**

Course designation	Introduction to the decision support system (DSS), an interactive computer-based system (or subsystem) intended to help decision makers. DSS simulate cognitive decision-making functions of humans based on AI methods including the area of knowledge: Expert systems, Data mining, Machine learning, Connectionism, Logical reasoning.
Semester(s) in which the course is taught	__ semester__
Person responsible for the course	Nguyen Van Sinh, Assoc.Prof.
Language	English
Relation to curriculum	Compulsory / elective / specialisation Names of other study programmes with which 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 assignments.
Credit points	Number of credits : 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	Object-Oriented Programming
Course objectives	A Decision Support System (DSS) is an interactive computer-based system or subsystem intended to help decision makers use communications technologies, data, documents, knowledge and/or models to identify and solve problems, complete decision process tasks, and make decisions. DSS simulate cognitive decision-making functions of humans based on artificial intelligence methodologies (including expert systems, data mining, machine learning, connectionism, logistical reasoning, etc.) in order to perform decision support functions. DSS

	<p>is a general term for any computer application that enhances a person or group's ability to make decisions. Also, DSS refers to an academic field of research that involves designing and studying DSS in their context of use.</p>																								
Course learning outcomes	<p>CLO 1. Understand the goals and different forms of decision support, and gain knowledge of the practical issues of implementation</p> <p>CLO 2. Examine systems based on statistical and logical approaches to decision making that include statistical prediction, rule-based systems, case-based reasoning, neural networks, fuzzy logic, etc.</p> <p>CLO 3. Obtain an overview of the various computerized decision support techniques together with a detailed assessment of successful and unsuccessful applications developed</p> <p>CLO 4. Examine the actual and potential impact of the technology together with the challenges associated with this kind of application</p>																								
	<table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge																					
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Collaborative computing technologies: Group support systems	3	I, T, U																							

	Review for Midterm Exam	3	U	
	Enterprise Information Systems	3	I, T, U	
	Knowledge management	3	I, T, U	
	Artificial intelligent & Expert systems: Knowledge-Based systems	3	I, T, U	
	Knowledge Acquisition, Representation and Reasoning	3	I, T, U	
	Advanced Intelligent Systems	3	I, T, U	
	Ecommerce applications	3	I, T, U	
	Review for final exam	3	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				

## 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	x					
2		x				
3		x				
4				x		

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Introduction to Decision Making and Decision Support	1			

<b>Week</b>	<b>Topic</b>	<b>CLO</b>	<b>Assessments</b>	<b>Learning activities</b>	<b>Resources</b>
2	Models, Cognitive Tools and Decision Making	2,3			
3	Decision support systems	2,3			
4	Modeling and analysis	2,3,4			
5	Data warehousing, Data Acquisition, Data Mining, Business analysis, and visualization	2,3,4			
<b>6</b>	<b>Midterm</b>				
7	Decision support system development	2,3,4			
8	Collaborative computing technologies: Group support systems	2,3,4			
9	Enterprise Information Systems	2,3,4			

Week	Topic	CLO	Assessments	Learning activities	Resources
10	Knowledge management	2,3,4			
11	Artificial intelligent & Expert systems: Knowledge-Based systems	2,3,4			
12	Knowledge Acquisition, Representation and Reasoning	2,3,4			
13	Advanced Intelligent Systems	2,3,4			
14	Ecommerce applications	2,3,4			
15	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3	CLO4
Labs (25%)	x	x	x	x
Midterm examination (30%)	x	x		
Final examination (40%)		x	x	x
Exercises/ Quiz (10%)	x	x	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

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

### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.

2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

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

### 5.3. Analytic rubric

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

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

<b>Influence of context and assumptions</b>	<p>Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.</p>	<p>Identifies own and others' assumptions and several relevant contexts when presenting a position.</p>	<p>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).</p>	<p>Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.</p>
<b>Student's position (perspective , thesis/hypothesis)</b>	<p>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).</p>	<p>Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).</p>	<p>Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.</p>	<p>Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.</p>
<b>Conclusions and related outcomes (implications and consequences)</b>	<p>Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.</p>	<p>Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.</p>	<p>Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications)</p>	<p>Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.</p>

			are identified clearly.	
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Source: Association of American Colleges and Universities

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

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

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

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

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



Nguyen Van Sinh

**Course Name: Time Series Analysis****Course Code: IT169IU****1. General information**

Course designation	The course will provide a basic introduction to modern time series analysis. We will cover time series regression and exploratory data analysis, ARMA/ARIMA models, model estimation, Fourier analysis, spectral estimation, and state space models				
Semester(s) in which the course is taught	6,8				
Person responsible for the course	Kieu Vu Thanh Tung, Dr.				
Language	English				
Relation to curriculum	Elective				
Teaching methods	Lecture, lesson, project, 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	Data mining, data structures and algorithms.				
Course objectives	This course introduces the basic time series analysis and forecasting methods. Topics include stationary processes, ARMA models, spectral analysis, model and forecasting using ARMA models, nonstationary and seasonal time series models, multivariate time series, state-space models, and forecasting techniques.				
Course learning outcomes	<table border="1"> <thead> <tr> <th>Competency level</th> <th>Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td>Knowledge</td> <td>CLO 1. Understand basic contents of time series analysis. CLO 2. Explain modern algorithms in the area of time series analysis.</td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO 1. Understand basic contents of time series analysis. CLO 2. Explain modern algorithms in the area of time series analysis.
Competency level	Course learning outcome (CLO)				
Knowledge	CLO 1. Understand basic contents of time series analysis. CLO 2. Explain modern algorithms in the area of time series analysis.				

	Skill	CLO 3. Apply time series analysis techniques to some case studies using existing datasets.																																		
	Attitude	CLO 4. Work in a team to build a time series analysis process.																																		
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weig ht</th> <th>Lev el</th> </tr> </thead> <tbody> <tr> <td>Introduction</td> <td>1</td> <td>I</td> </tr> <tr> <td>Overview of forecasting</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Stationary Process and ARMA Models</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Spectral Analysis</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Modeling and Forecasting with ARMA Processes</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Nonstationary and Seasonal Time Series Models</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Multivariate Time Series</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>State-Space Model</td> <td>1</td> <td>T, U</td> </tr> <tr> <td>Forecasting Techniques</td> <td>1</td> <td>T, I</td> </tr> <tr> <td>Estimation of time series models</td> <td>1</td> <td>T, I</td> </tr> </tbody> </table>			Topic	Weig ht	Lev el	Introduction	1	I	Overview of forecasting	1	T, U	Stationary Process and ARMA Models	2	T, U	Spectral Analysis	1	T, U	Modeling and Forecasting with ARMA Processes	2	T, U	Nonstationary and Seasonal Time Series Models	2	T, U	Multivariate Time Series	1	T, U	State-Space Model	1	T, U	Forecasting Techniques	1	T, I	Estimation of time series models	1	T, I
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Examination forms	Multiple-choice questions, short-answer questions																																			
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																			
Reading list	<ol style="list-style-type: none"> <li>1. Box, G.E.P., Jenkins, G.M. and Reinsel, G.C. (1994). Time Series Analysis: Forecasting and Control, 3rd Edition, Prentice Hall, New Jersey.</li> <li>2. Chatfield, C. (1996). The Analysis of Time Series, 5th edition, Chapman and Hall, New York.</li> <li>3. Shumway, R.H., Stoffer, D.S. (2006). Time Series Analysis and Its Applications (with R examples). Springer-Verlag, New York.</li> <li>4. James D. Hamilton (1994). Time Series Analysis, 1st Edition, Princeton University Press,</li> <li>5. Galit Shmueli and Kenneth C. Lichtendahl Jr (2016). Practical Time Series Forecasting with R: A Hands-On Guide, 2nd Edition, Axelrod Schnall Publishers.</li> </ol>																																			

## 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:

<b>CLO</b>	<b>SLO</b>					
	1	2	3	4	5	6
1	x					
2	x					
3						x
4					x	

## 3. Planned learning activities and teaching methods

<b>Wee k</b>	<b>Topic</b>	<b>CL O</b>	<b>Assessmen ts</b>	<b>Learning activities</b>	<b>Resources</b>
1	Introduction	1		Lecture, Discussion	[1, 2]. Chapter 1
2	Overview of forecasting	1	Quiz.s2	Lecture, In-class quiz	[3]. Chapter 2
3-4	Stationary Process and ARMA Models	1, 3	Quiz.s3-4	Lecture, Discussion	[1]. Chapter 3
5	Spectral Analysis	1, 3	Quiz.s5	Lecture, In-class quiz	[3]. Chapter 4
6-7	Modeling and Forecasting with ARMA Processes	1, 3	Quiz.s6-7	Lecture, In-class quiz	[1]. Chapter 5
8	<b>Mid-term Exam</b>				
9-10	Nonstationary and Seasonal Time Series Models	1, 3	Quiz.s9-10	Lecture, In-class quiz	[1]. Chapter 4
11	Multivariate Time Series	1, 3, 4	Quiz.s11	Lecture, In-class quiz	[1]. Chapter 14 [1]. Chapter 12
12	State-Space Model	1, 2, 4	Quiz.s12	Lecture, In-class quiz	[2]. Chapter 10 [3]. Chapter 6
13	Forecasting Techniques	1, 2, 4	Quiz.s13	Lecture, In-class quiz	[2]. Chapter 5

14	Estimation of time series models	1, 4	Quiz.s14	Lecture, In-class quiz	[2]. Chapter 13
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**Laboratory**

Week	Lab
3	Introduction to Python
4	Overview of forecasting
7	Stationary Process and ARMA Models
9	Spectral Analysis
10	Modeling and Forecasting with ARMA Processes
11	Nonstationary and Seasonal Time Series Models
12	Multivariate Time Series
13	State-Space Model

**4. Assessment plan**

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Labs (10%)			100%	
Programming (20%)			70%	30%
Midterm examination (30%)	50%	50%		
Final examination (40%)		40%	60%	

**5. Rubrics (optional)****5.4. Grading checklist**

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

Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

### 5.5. Holistic rubric

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

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

### 5.6. Analytic rubric

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

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

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

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

Source: Association of American Colleges and Universities

Date revised: May 12, 2023

Ho Chi Minh City, 12/05/2023   
**Dean of School of Computer Science and Engineering**



**Nguyen Van Sinh**

**Course Name: Theory of networks****Course Code: IT146IU****1. General information**

Course designation	The course introduces the interconnectedness of modern life, answers the fundamental questions about how our social, economic, and technological worlds are connected.
Semester(s) in which the course is taught	6 or 7
Person responsible for the course	Vo Thi Luu Phuong, Assof.Pror.Dr.
Language	English
Relation to curriculum	Elective
Teaching methods	Lecture, lesson, laboratory.
Workload (incl. contact hours, self-study hours)	(Estimated) Total workload: 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	
Course objectives	The course introduces the interconnectedness of modern life, answers the fundamental questions about how our social, economic, and technological worlds are connected. Students will study the modern network models, such as, game theory, the structure of the Internet, social contagion, the spread of social power and popularity, and information cascades.
Course learning outcomes	CLO 1. Use the tools of graph theory as a basis for studying the Internet social networks, and the process of Web search.  CLO 2. Apply game theory to analyze strategic behavior in a variety of settings including auction design, Web advertising, network routing, and social marketing.

	<p>CLO 3. Analyze the processes by which ideas, beliefs, opinions, products, technologies, and social conventions spread through social networks.</p> <table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO1, 2</td></tr> <tr> <td>Skill</td><td>CLO1, 2</td></tr> <tr> <td>Attitude</td><td>CLO3</td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1, 2	Skill	CLO1, 2	Attitude	CLO3													
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Network graphs;</td><td>9</td><td>T, U</td></tr> <tr> <td>Network games, auctions</td><td>12</td><td>T, U</td></tr> <tr> <td>The Structure of the Web</td><td>6</td><td>T, U</td></tr> <tr> <td>Sponsored Search Markets</td><td>1</td><td>T, U</td></tr> <tr> <td>Network Effects</td><td>6</td><td>T, U</td></tr> <tr> <td>Markets and Information</td><td>9</td><td>T, U</td></tr> </tbody> </table>	Topic	Weight	Level	Network graphs;	9	T, U	Network games, auctions	12	T, U	The Structure of the Web	6	T, U	Sponsored Search Markets	1	T, U	Network Effects	6	T, U	Markets and Information	9	T, U
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Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																					
Reading list	<ol style="list-style-type: none"> <li>1. David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning about a Highly Connected World 1st, 2010</li> <li>2. Thomas W. Miller, Web and Network Data Science: Modeling Techniques in Predictive Analytics 1st, 2014</li> <li>3. James Kurose and Keith Ross, Computer networking: A top-down approach 7th, 2016</li> </ol>																					

## 2. Learning Outcomes Matrix (optional)

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

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

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1-3	Network graphs	1,2	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, laboratory	[1, 2, 3]
4-7	Network games, auctions	1,2,3	Quiz, Midterm, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
	<b>Midterm</b>				
9-10	The Structure of the Web	1,2,3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
11-12	Sponsored Search Markets	2,3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
13	Network Effects	1,2	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
14-15	Markets and Information	1,2,3	Quiz, Final, Homework	Lecture, discussion, in-class exercise, homework, laboratory	[1, 2, 3]
	<b>Final exam</b>				

## 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Labs (25%)		33.3%	50%
Midterm examination (30%)	33.3%	33.3%	

Homework (10%)	33.3%		50%
Final examination (35%)	33.3%	33.3%	

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.<sup>←</sup>

## 5. Rubrics (optional)

### 5.1. Grading checklist

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

### 5.2. Holistic rubric

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

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

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

### 5.3. Analytic rubric

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

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

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

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

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

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

	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.	presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation understandable , and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.

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



**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 Software engineering
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; construct project related documentation.

		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																																																		
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 teaching hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th><b>Topic</b></th> <th><b>Weigh t</b></th> <th><b>Leve l</b></th> </tr> </thead> <tbody> <tr> <td>Week 1: Orientation &amp; Introduction to the course</td> <td>3</td> <td>I,T</td> </tr> <tr> <td>Week 2: Introduction to IT project management</td> <td>3</td> <td>I,T</td> </tr> <tr> <td>Week 3: Software project planning</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 4: Estimation (cost, time, scope)</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 5: Project Schedules</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 6: Review process</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 7: Software Requirement</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 8: Design &amp; Programming</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 9: Review for midterm examination</td> <td>3</td> <td>U</td> </tr> <tr> <td>Week 10: Design and Programming</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 11: Software Testing</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 12: Understanding Change</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 13: Management and Leadership</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 14: Managing an Outsourced Project</td> <td>3</td> <td>I,T, U</td> </tr> <tr> <td>Week 15: Process Improvement.</td> <td>3</td> <td>I,T, U</td> </tr> </tbody> </table>	<b>Topic</b>	<b>Weigh t</b>	<b>Leve l</b>	Week 1: Orientation & Introduction to the course	3	I,T	Week 2: Introduction to IT project management	3	I,T	Week 3: Software project planning	3	I,T, U	Week 4: Estimation (cost, time, scope)	3	I,T, U	Week 5: Project Schedules	3	I,T, U	Week 6: Review process	3	I,T, U	Week 7: Software Requirement	3	I,T, U	Week 8: Design & Programming	3	I,T, U	Week 9: Review for midterm examination	3	U	Week 10: Design and Programming	3	I,T, U	Week 11: Software Testing	3	I,T, U	Week 12: Understanding Change	3	I,T, U	Week 13: Management and Leadership	3	I,T, U	Week 14: Managing an Outsourced Project	3	I,T, U	Week 15: Process Improvement.	3	I,T, U				
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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	<ol style="list-style-type: none"> <li>1. Kathy Schwalbe, IT Project Management - 9th Edition, 2019</li> <li>2. Stellman and Greene, <i>Applied Software Project Management</i>, O'Reilly Media, 2006.</li> <li>3. Marchewka, J.T., Information Technology Project Management Providing Measureable Organizational Value 5th, 2016</li> </ol>

## 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:

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

## 3. Planned learning activities and teaching methods

Week	Topic	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	[1, 2, 3]

				In-class exercises	
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	<b>Final examination</b>	2,3,4			

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
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: .....	Evaluator: .....
		Max.	Score
<b>Technical content (60%)</b>			Comments
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		

<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

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

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

Source: Association of American Colleges and Universities

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

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

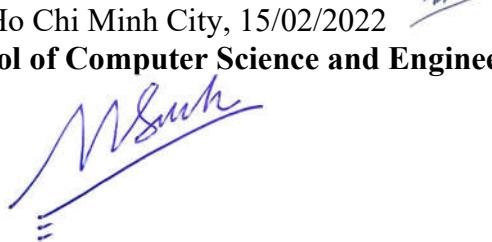
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or	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	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	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/

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

*Source: Association of American Colleges and Universities*

**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: Information System Management**  
**Course Code: IT094IU**

**1. General information**

Course designation	This course covers the concepts of information systems and their applications to business processes				
Semester(s) in which the course is taught	6				
Person responsible for the course	Dr. Tran Thanh Tung				
Language	English				
Relation to curriculum	Elective course (CS, DS) Specialization (required) (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	Principles of Database Management				
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	<p>CLO 1. understand basic information system concepts as applied to business operations and management.</p> <p>CLO 2. identify the major components of a computer system, including hardware, software, operating systems and operating environments as they apply to information systems.</p> <p>CLO 3. develop basic MIS applications such as spreadsheet, database, and web development.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Competency level</th> <th style="text-align: center;">Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Knowledge</td> <td style="text-align: center;">1, 2</td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	1, 2
Competency level	Course learning outcome (CLO)				
Knowledge	1, 2				

		Skill	3																																					
		Attitude																																						
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>																																							
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Building Information Systems;	2	T,U																																						
Managing Knowledge;	1	T																																						
Enhancing Decision Making.	1	T																																						
Examination forms	Multiple-choice questions, short-answer questions																																							
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																																							
Reading list	<ol style="list-style-type: none"> <li>1. Kenneth C. Laudon, Jane P. Laudon, Management Information Systems: Managing the Digital Firm 14th, 2016</li> <li>2. Kenneth C. Laudon and Jane Laudon, Essentials of Management Information Systems 11th, 2015</li> </ol>																																							

## 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:

	SL O					
CL O	1	2	3	4	5	6
1		x		x		
2		x		x		
3		x				

### 3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessmen ts	Learning activities	Resource s
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	
<b>6</b>	<b>Midterm</b>				
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	<b>Final exam</b>				

#### 4. Assessment plan

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

Assessment Type	CLO 1	CLO 2	CLO 3
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: .....
	Max	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>			
<b>TOTAL SCORE</b>	100		

##### 5.2. Holistic rubric

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

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

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

### 5.3. Analytic rubric

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

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

			mostly fact, with little questioning.	
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective , thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and	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 is inconsistently tied to some of the information discussed; related

	ability to place evidence and perspectives discussed in priority order.	related outcomes (consequences and implications) are identified clearly.	conclusion); some related outcomes (consequences and implications) are identified clearly.	outcomes (consequences and implications) are oversimplified.
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Source: Association of American Colleges and Universities

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

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

<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and	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.

	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**



Assoc.Prof. Nguyen Van Sinh

**Course Name: Big Data Analytics****Course Code: IT173IU****1. General information**

Course designation	The aim of this course is first to provide the students revision on the critical concepts and knowledges of big data, the goals of big data. Secondly, it gives the students the overview on the popular techniques and latest technologies used to deal with big data analytics.
Semester(s) in which the course is taught	7
Person responsible for the course	Mai Hoang Bao An, PhD.
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	Object-Oriented Programming Principles of Database Management Data Mining
Course objectives	Big Data Analytics provides baseline general knowledge of the techniques and technologies used in Data era of both small-to-medium tabular data to Big Data solutions. It covers the development of solutions using the Hadoop ecosystem, including MapReduce, HDFS, Apache Spark programming frameworks. This course helps students build a foundation for working with Apache Big Data solutions.

<p>Course learning outcomes</p>	<p>CLO 1. Revise the knowledge of data pipeline, small-to-medium data, types of data and related use cases. Revision on the programming used to handle with data pipeline.</p> <p>CLO 2. Get knowledge of selecting data solutions. Identify common tools and technologies that can be used to create Big Data solutions.</p> <p>CLO 3. Get knowledges on popular models of Big Data Analytics with Spark. Design the MapReduce programming framework, including the map, shuffle and sort, and reduce components.</p> <p>CLO 4. Get to know how to do the learning pipelines with Big Data. Implement Big Data solutions using different big data programming frameworks.</p>																			
<p>Content</p>	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Revision on data pipeline concepts Introduction to some successful data solutions.</td><td>1</td><td>I</td></tr> <tr> <td>Introduction to Big Data Introduction to necessary tools</td><td>1</td><td>I, U</td></tr> <tr> <td>Remind on EDA Remind on Python and some related libraries used to analyze data.</td><td>1</td><td>T, U</td></tr> <tr> <td>Advanced on programming used to deal with data pipeline, Big Data. Applications in Text Analytics Support Visual Analytics in data pipeline</td><td>1</td><td>T, U</td></tr> <tr> <td>Summary on data preparation Databases for common data and related contents</td><td>1</td><td>T, U</td></tr> </tbody> </table>	Topic	Weight	Level	Revision on data pipeline concepts Introduction to some successful data solutions.	1	I	Introduction to Big Data Introduction to necessary tools	1	I, U	Remind on EDA Remind on Python and some related libraries used to analyze data.	1	T, U	Advanced on programming used to deal with data pipeline, Big Data. Applications in Text Analytics Support Visual Analytics in data pipeline	1	T, U	Summary on data preparation Databases for common data and related contents	1	T, U	
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Revision on data pipeline concepts Introduction to some successful data solutions.	1	I																		
Introduction to Big Data Introduction to necessary tools	1	I, U																		
Remind on EDA Remind on Python and some related libraries used to analyze data.	1	T, U																		
Advanced on programming used to deal with data pipeline, Big Data. Applications in Text Analytics Support Visual Analytics in data pipeline	1	T, U																		
Summary on data preparation Databases for common data and related contents	1	T, U																		

	<p>Introduction to Dask for handling with Big data.</p> <p>Practice with Dask</p> <p>Remind to Hadoop/MapReduce Some examples with the concepts of MapReduce in python.</p> <p>Data preparation with pySpark</p> <ul style="list-style-type: none"> <li>- Data manipulation</li> <li>- Data preparation</li> <li>- Miscellaneous</li> </ul> <p>Machine Learning with Spark</p> <ul style="list-style-type: none"> <li>- Regression</li> <li>- Classification</li> </ul> <p>Basic Text Mining with Spark A case study Some advanced topics: Apache Kafka</p>	1	T, U	
Examination forms	Short-answer questions, Long-answer questions, projects			
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] Viktor Mayer-Schönberger, Kenneth Cukier., Big Data: A Revolution That Will Transform How We Live, Work, and Think., Harper Business; Reprint edition. [2] Sumit Pal., SQL on Big Data: Technology, Architecture, and Innovation., Apress; 1st edition. [3] Nandhini Abirami R, Seifedine Kadry, Amir H. Gandomi, Balamurugan Balusamy., Big Data: Concepts, Technology, and Architecture., Wiley; 1st edition. [4] Bill Chambers, Matei Zaharia., Spark: The Definitive Guide: Big Data Processing Made Simple., O'Reilly Media; 1st edition.			

## 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	X					
2	X	X	X			
3		X		X	X	X
4					X	X

### 3. Planned learning activities and teaching methods

Wee k	Topic	CLO	Assessment s	Learning activities	Resources
1	Revision on data pipeline concepts Introduction to some successful data solutions.	1		Lecture, Discussion	[1] Chapter 1, 2
2	Introduction to Big Data Introduction to necessary tools	1, 2	Exercises	Lecture, In-class exercises	[1,2] Chapter 2, 3
3	Remind on EDA Remind on Python and some related libraries.	1, 2	Exercises	Lecture, In-class exercises	[1,2,3] Chapter 4, 5
4	Advanced on programming used to deal with data pipeline, Big Data. Applications in Text Analytics Support Visual Analytics in data pipeline	1, 2	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 5, 6
5	Summary on data preparation Databases for common data and related contents	2, 3	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 7
6	Introduction to Dask for handling with Big data.	2, 3	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 8, 9
7-8	Practice with Dask	2, 3, 4	Exercises, labs	Lecture, In-class exercises	[2,3] Chapter 10, 11
9	<b>Midterm</b>				
10	Remind to Hadoop/MapReduce	2, 3, 4	Exercises, labs	Lecture, In-class exercises	[4] Chapter 3, 4, 5

Wee k	Topic	CLO	Assessment s	Learning activities	Resources
	Some examples with the concepts of MapReduce in python.				
11-12	Data preparation with pySpark - Data manipulation - Data preparation - Miscellaneous	2, 3, 4	Exercises, labs	Lecture, In-class exercises	[4] Chapter 6, 7, 8
13-15	Machine Learning with Spark - Regression - Classification	2, 3, 4	Projects, labs	Lecture, In-class exercises	[4] Chapter 8, 9, 10, 11
16	Basic Text Mining with Spark A case study Some advanced topics: Apache Kafka	3, 4	Seminar	Lecture, Discussion	[4] Chapter 12
17	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Quiz (15%)	20%		20%	20%
Midterm examination (30%)	50%	50%		
Projects/Presentations/ Report (15%)	30%		30%	30%
Final examination (40%)		50%	50%	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: .....		Evaluator: .....	
	Max.	Score	Comments

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

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described	Issue/ problem to be considered critically is stated,	Issue/ problem to be considered critically is stated but	Issue/ problem to be considered critically is stated without

	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.	clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

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

Source: Association of American Colleges and Universities

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

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

	consistently observable and is skillful and makes the content of the presentation cohesive.	clearly and consistently observable within the presentation.	intermittently observable within the presentation.	within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or

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

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

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



**Nguyen Van Sinh**

**Course Name: Cloud Computing****Course Code: IT164IU****1. General information**

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	
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.

		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																									
		Knowledge	1																									
		Skill	2, 3																									
		Attitude	3																									
Content		<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>																										
		<table border="1"> <thead> <tr> <th><b>Topic</b></th> <th><b>Weight</b></th> <th><b>Level</b></th> </tr> </thead> <tbody> <tr> <td>Introduction to Cloud Computing</td> <td>1</td> <td>I</td> </tr> <tr> <td>Cloud Computing Platforms</td> <td>3</td> <td>T</td> </tr> <tr> <td>Parallel Programming in the Cloud</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Distributed Storage Systems</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Virtualization</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Cloud Security</td> <td>2</td> <td>T</td> </tr> <tr> <td>Multicore Operating Systems</td> <td>1</td> <td>T</td> </tr> </tbody> </table>			<b>Topic</b>	<b>Weight</b>	<b>Level</b>	Introduction to Cloud Computing	1	I	Cloud Computing Platforms	3	T	Parallel Programming in the Cloud	3	T, U	Distributed Storage Systems	3	T, U	Virtualization	2	T, U	Cloud Security	2	T	Multicore Operating Systems	1	T
<b>Topic</b>	<b>Weight</b>	<b>Level</b>																										
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Virtualization	2	T, U																										
Cloud Security	2	T																										
Multicore Operating Systems	1	T																										
Examination forms		Short-answer questions, Programming exercises																										
Study and examination requirements		<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																										
Reading list		<ol style="list-style-type: none"> <li>1. Rountree, Derrick, and Ileana Castrillo. <i>The basics of cloud computing: Understanding the fundamentals of cloud computing in theory and practice</i>. Newnes, 2013.</li> <li>2. Patterson, Scott. <i>Learn AWS Serverless Computing: A Beginner's Guide to Using AWS Lambda, Amazon API Gateway, and Services from Amazon Web Services</i>. Packt Publishing Ltd, 2019.</li> </ol>																										

## 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	X					
2		XX				
3						X

### 3. Planned learning activities and teaching methods

Week	Topic	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
<b>Midterm</b>					
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
<b>Final</b>					

#### 4. Assessment plan

Assessment Type	CLO1	CLO2	CLO3
Quiz / Assignment (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
<b>Technical content (60%)</b>				
Abstract clearly identifies purpose and summarizes principal content	10			
Introduction demonstrates thorough knowledge of relevant background and prior work	15			
Analysis and discussion demonstrate good subject mastery	30			
Summary and conclusions appropriate and complete	5			

<b>Organization (10%)</b>				
Distinct introduction, body, conclusions		5		
Content clearly and logically organized, good transitions		5		
<b>Presentation (20%)</b>				
Correct spelling, grammar, and syntax		10		
Clear and easy to read		10		
<b>Quality of Layout and Graphics (10%)</b>		10		
<b>TOTAL SCORE</b>		100		

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

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

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

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

Source: Association of American Colleges and Universities

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

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

<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or	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	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	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/

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

*Source: Association of American Colleges and Universities*

**Date revised: August 28, 2023**

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



**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.																																													
	<table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO1, CLO1</td></tr> <tr> <td>Skill</td><td>CLO3, CLO4</td></tr> <tr> <td>Attitude</td><td>CLO2</td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1, CLO1	Skill	CLO3, CLO4	Attitude	CLO2																																					
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Introduction</td><td>3</td><td>I</td></tr> <tr> <td>Cryptography &amp; cryptocurrencies</td><td>3</td><td>T</td></tr> <tr> <td>How Bitcoin achieve decentralization</td><td>3</td><td>I, T</td></tr> <tr> <td>Mechanics of Bitcoin</td><td>3</td><td>T, U</td></tr> <tr> <td>How to store and use Bitcoin</td><td>3</td><td>T, U</td></tr> <tr> <td>Bitcoin mining</td><td>3</td><td>T</td></tr> <tr> <td>Bitcoin and Anonymity</td><td>3</td><td>T</td></tr> <tr> <td>Ethereum</td><td>3</td><td>I, T</td></tr> <tr> <td>Solidity</td><td>3</td><td>T, U</td></tr> <tr> <td>Token</td><td>3</td><td>I, T</td></tr> <tr> <td>Oracle</td><td>3</td><td>I, T</td></tr> <tr> <td>Decentralized Applications (Dapps)</td><td>3</td><td>T, U</td></tr> <tr> <td>Design pattern for blockchain applications</td><td>3</td><td>T</td></tr> <tr> <td>Real-world applications</td><td>3</td><td>I, T</td></tr> </tbody> </table>	Topic	Weight	Level	Introduction	3	I	Cryptography & cryptocurrencies	3	T	How Bitcoin achieve decentralization	3	I, T	Mechanics of Bitcoin	3	T, U	How to store and use Bitcoin	3	T, U	Bitcoin mining	3	T	Bitcoin and Anonymity	3	T	Ethereum	3	I, T	Solidity	3	T, U	Token	3	I, T	Oracle	3	I, T	Decentralized Applications (Dapps)	3	T, U	Design pattern for blockchain applications	3	T	Real-world applications	3	I, T
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Reading list	[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 Blockchain Applications. Springer, 2019.
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## 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:

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

## 3. Planned learning activities and teaching methods

Wee k	Topic	CLO	Assessments	Learning activities	Resource s
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	
<b>8</b>	<b>Midterm</b>				
9	Ethereum	2,3	Project	Teaching, Presentation	
10	Solidity	2,3	Project	Teaching, Presentation	
11	Token	3,4	Quiz, In-class exercises	Teaching, Presentation	

Week	Topic	CLO	Assessments	Learning activities	Resources
12	Oracle	2,3	Quiz, In-class exercises	Teaching, Presentation Group discussion	
13	Decentralized Applications (Dapps)	3,4	Quiz, In-class exercises	Teaching, Presentation	
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	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Labs (20%)			x	x
Midterm examination (30%)	x	x		
Final examination (40%)		x	x	
Exercises/ Quiz (10%)	x			

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

- 
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.↔

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

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

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

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant	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	Issue/ problem to be considered critically is stated without clarification or description.

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

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

Source: Association of American Colleges and Universities

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

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

	consistently observable and is skillful and makes the content of the presentation cohesive.	clearly and consistently observable within the presentation.	intermittently observable within the presentation.	within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or

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

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

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

  
**Nguyen Van Sinh**

**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 outcomes	CLO 1. Understand entrepreneurial processes; CLO 2. Apply new technology to boost business performance; CLO 3. Manage marketing strategy and financial statements in a enterprise; <table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>1, 2, 3</td></tr> <tr> <td>Skill</td><td>1, 3</td></tr> <tr> <td>Attitude</td><td>3</td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	1, 2, 3	Skill	1, 3	Attitude	3										
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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	5. Duening & Hisrich & Lechter, Technology Entrepreneurship 2nd, 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:

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

## 3. Planned learning activities and teaching methods

Wee k	Topic	CL O	Assessmen ts	Learning activities	Resource s
1	Entrepreneurship, Creativity and Innovation;	1	Midterm exam	Lecture, In-class activities, Quiz	
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	<b>Final exam</b>				

## 4. Assessment plan

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

Assessment Type	CLO 1	CLO 2	CLO 3
Midterm examination (25%)	50%	50%	
Projects/Presentations/ Report (25%)			60%
Final examination (40%)			40%
Exercises/ Quiz (10%)	50%	50%	

## 5. Rubrics (optional)

### 5.1. Grading checklist

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

### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
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.
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1	Demonstrates no understanding of the problem.
0	No response/task not attempted

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

### 5.3. Analytic rubric

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

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

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

Source: Association of American Colleges and Universities

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

	Capstone	Milestone		Benchmark
	4	3	2	1

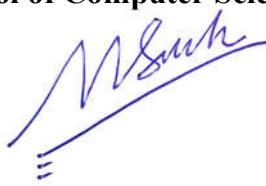
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion,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

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

Source: Association of American Colleges and Universities

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: Optimization and Applications****Course Code: IT163IU****1. General information**

Course designation	This subject covers linear programming, convex optimization theory, and applications.
Semester(s) in which the course is taught	6 or 7
Person responsible for the course	Assoc. Prof. Vo Thi Luu Phuong, Ph.D.
Language	English
Relation to curriculum	Elective
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.
Credit points	Number of credits: 4 Lecture: 3 Laboratory: 1
Required and recommended prerequisites for joining the course	
Course objectives	Optimization, particularly convex optimization, is applied in many fields such as data science, computer science, economics, engineering, logistics, etc. Optimization models of various applications in machine learning, resource allocations, etc. are introduced. Background theory of iterative algorithms solving problems such as gradient descent, mini-batch stochastic gradient descent, subgradient method, proximal gradient descent, etc. are taught. The course also covers linear programming (LP) which is a subfield of convex optimization. Some LP applications such as max flow – min cut, transportation, shortest path,... problems are mentioned.
Course learning outcomes	CLO 1. Formulate a practical problem as an optimization model and solve it using optimization solvers. CLO 2. Understand the background theory of convex problem, duality, and iterative algorithms solving the problems. CLO 3. Be able to develop computer programs that applied iterative algorithms such as gradient descent, stochastic

	gradient descent, proximal gradient descent, subgradient method, ... to solve optimization problems in various applications.																															
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>																															
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	Second-order methods: - Newton method - Log-barrier method	1	I, U, T
	Advanced topic in optimization	1	I, U
	Final review	1	U
Examination forms	Multiple-choice questions, short-answer questions, programming		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>		
Reading list	<ol style="list-style-type: none"> <li>Stephen P. Boyd and Lieven Vandenberghe. Convex optimization. Cambridge university press, 2004.</li> <li>Robert J. Vanderbei. Linear programming: foundations and extensions, 5th edition. Springer Nature, 2020.</li> </ol>		

## 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	XX					
3						X

## 3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessments	Learning activities	Resources
1	Course introduction	2		lecture	1, 2
2	Mathematical background (linear algebra and calculus)	2		lecture	1
3-4	Linear program and applications	1, 2	Midterm, homework, lab	lecture, exercises, lab	2
5	Integer linear program and its applications	1, 2	Midterm, homework	lecture, exercises	2
6	Convex sets and convex functions	1, 2	Midterm, homework	lecture, exercises	1

7	Some applications: - Linear regression - Classification - Regularization: Ridge regression, Lasso regression	1	Midterm, homework, lab	lecture, exercises, lab	1, 2
	<b>Midterm</b>				
8-10	First-order methods: - gradient descent - subgradient - stochastic gradient - proximal gradient	2, 3	Final, homework, lab	lecture, exercises, lab	1
11	Duality - Lagrange, duality gap - KKT condition - Dual problem	2	Final, homework	lecture, exercises	1
12	Dual-based methods: - Dual decomposition - Dual of support vector machine problem	2, 3	Final, homework, lab	lecture, exercises, lab	1
13	Second-order methods: - Newton method - Log-barrier method	2, 3	Final, homework, lab	lecture, exercises, lab	1
14	Advanced topic in optimization	2	Final, homework	lecture, exercises	Literature
15	Final review	1		lecture	
14	<b>Final exam</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3
Labs (25%)	25%		50%
Midterm examination (30%)	25%	40%	
Final examination (35%)	25%	40%	25%
Homeworks (10%)	25%	20%	25%

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

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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

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

### 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
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
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Note: this rubric is also used to evaluate questions in an exam.

### 5.3. Analytic rubric

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

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

Source: Association of American Colleges and Universities

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

	Capstone	Milestone	Benchmark
	4	3	2

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

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

Source: Association of American Colleges and Universities

Date revised: February 15, 2022

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



**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	Object-Oriented Programming Principle of Database Management
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.

		<b>Competency level</b>	<b>Course learning outcome (CLO)</b>																															
		Knowledge	CLO1																															
		Skill	CLO2, CLO3																															
		Attitude	CLO3																															
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th><b>Topic</b></th> <th><b>Weight</b></th> <th><b>Level</b></th> </tr> </thead> <tbody> <tr> <td>Software development in practice</td> <td>3</td> <td>I</td> </tr> <tr> <td>Beginning a project</td> <td>3</td> <td>T, U</td> </tr> <tr> <td>Requirements</td> <td>7.5</td> <td>T, U</td> </tr> <tr> <td>The user experience</td> <td>4.5</td> <td>T, U</td> </tr> <tr> <td>System design</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>Program development</td> <td>7.5</td> <td>T, U</td> </tr> <tr> <td>Reliability and testing</td> <td>6</td> <td>T, U</td> </tr> <tr> <td>The business of software development</td> <td>4.5</td> <td>T, U</td> </tr> <tr> <td>Review</td> <td>3</td> <td>I, U</td> </tr> </tbody> </table>				<b>Topic</b>	<b>Weight</b>	<b>Level</b>	Software development in practice	3	I	Beginning a project	3	T, U	Requirements	7.5	T, U	The user experience	4.5	T, U	System design	6	T, U	Program development	7.5	T, U	Reliability and testing	6	T, U	The business of software development	4.5	T, U	Review	3	I, U
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Reading list	<ol style="list-style-type: none"> <li>1. Ian Sommerville, Software Engineering 10th, 2019.</li> <li>2. Hyrum Wright, Titus Winters, and Tom Mansreck. Software Engineering at Google, 2020</li> <li>3. Hans van Vliet, Software Engineering: Principles and Practice 3rd, 2008</li> </ol>																																	

## 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	

### 3. Planned learning activities and teaching methods

Week	Topic	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	<b>Midterm</b>				
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	<b>Final exam</b>				

#### 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.

#### 5. Rubrics (optional)

##### 5.1. Grading checklist

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

##### 5.2. Holistic rubric

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

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

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

### 5.3. Analytic rubric

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

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

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

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

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

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

	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.	presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness ) make the presentation understandable , and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.

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

Assoc.Prof. Nguyen Van Sinh



**Course Name: Discrete Mathematics****Course Code: IT153IU****1. General information**

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	Fundamental of Programming Calculus 1
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

	<p>to work with discrete structures and practical problems in computer science and IT</p> <p>CLO 3. Apply algorithm thinking and modeling; Apply knowledge in computer science for problems solving</p> <p>CLO 4. Have a sense of preparation of good mathematical knowledges to approach and solve problems in computer science and information technology.</p> <table border="1"> <thead> <tr> <th><b>Competency level</b></th><th><b>Course learning outcome (CLO)</b></th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO1, CLO2</td></tr> <tr> <td>Skill</td><td>CLO2, CLO3</td></tr> <tr> <td>Attitude</td><td>CLO4</td></tr> </tbody> </table>	<b>Competency level</b>	<b>Course learning outcome (CLO)</b>	Knowledge	CLO1, CLO2	Skill	CLO2, CLO3	Attitude	CLO4																															
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Skill	CLO2, CLO3																																							
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 teaching hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th><b>Topic</b></th><th><b>Weigh t</b></th><th><b>Leve l</b></th></tr> </thead> <tbody> <tr> <td>Week 1: Course syllabus and introduction; Logic and propositions</td><td>3</td><td>I,T</td></tr> <tr> <td>Week 2: Logic and propositions (continue)</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 3: Propositional Equivalences; predicates and quantifiers</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 4: Nested Quantifiers and Methods of Proof</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 5: Induction and recursion</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 6&amp;7: Number of theory</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 8: Counting: part 1, 2; midterm review</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 9: Counting: part 3</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 10: Advanced counting</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 11: Boolean algebras</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 12: Graph theory</td><td>3</td><td>I,T, U</td></tr> <tr> <td>Week 13: Optimal problem solving on graphs</td><td>3</td><td>I,T, U</td></tr> </tbody> </table>	<b>Topic</b>	<b>Weigh t</b>	<b>Leve l</b>	Week 1: Course syllabus and introduction; Logic and propositions	3	I,T	Week 2: Logic and propositions (continue)	3	I,T, U	Week 3: Propositional Equivalences; predicates and quantifiers	3	I,T, U	Week 4: Nested Quantifiers and Methods of Proof	3	I,T, U	Week 5: Induction and recursion	3	I,T, U	Week 6&7: Number of theory	3	I,T, U	Week 8: Counting: part 1, 2; midterm review	3	I,T, U	Week 9: Counting: part 3	3	I,T, U	Week 10: Advanced counting	3	I,T, U	Week 11: Boolean algebras	3	I,T, U	Week 12: Graph theory	3	I,T, U	Week 13: Optimal problem solving on graphs	3	I,T, U
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	Week 14: Introduction and application of tree	3	I,T, U
	Week 15: Search on tree; review for final exam	3	I,T, U
Examination forms	Multiple-choice questions, short-answer questions		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>		
Reading list	<ol style="list-style-type: none"> <li>1. Kenneth H. Rosen, Discrete Mathematics and Its Applications 8<sup>th</sup> edition, 2019.</li> <li>2. Oscar Levin, Discrete mathematics An Open Introduction. 3<sup>rd</sup> edition, 2019.</li> <li>3. Vietnamese book: N.V.Sinh, T.M.Hà, N.T.T.Sang, N.M.Quân, “Nền tảng Toán học trong Công nghệ Thông tin”, NXB - Đại học Quốc gia TPHCM, ISBN: 978-604-73-6518-0, 2018.</li> </ol>		

## 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 O	1	2	3	4	5	6
1	X	X				
2	X	X				
3		X				
4						X

## 3. Planned learning activities and teaching methods

Week	Topic	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,	[1, 2]

				In-class exercises	
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]
<b>Midterm examination</b>					
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	<b>Final examination</b>				

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
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

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
Max.	Score	Comments	
<b>Technical content (60%)</b>			

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

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively,	Issue/ problem to be considered critically is stated, described, and clarified so that	Issue/ problem to be considered critically is stated but description	Issue/ problem to be considered critically is stated without clarification

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

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

Source: Association of American Colleges and Universities

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

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

	consistently observable and is skillful and makes the content of the presentation cohesive.	clearly and consistently observable within the presentation.	intermittently observable within the presentation.	within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or

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

Source: Association of American Colleges and Universities

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: Natural Language Processing****Course Code: IT170IU****1. General information**

Course designation	This course provides an introduction to the field of Natural Language Processing (NLP), covering fundamental concepts, techniques, and applications for understanding and processing human language by computers. Students will learn about text preprocessing, language modeling, sentiment analysis, and machine translation. The course includes hands-on programming assignments and projects to reinforce theoretical concepts and practical skills.		
Semester(s) in which the course is taught	6,8		
Person responsible for the course	Assoc. Prof. Nguyen Thi Thuy Loan, PhD.		
Language	English		
Relation to curriculum	Elective		
Teaching methods	Lecture, lesson, project, 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	Data structures and algorithms; Principle of Database Management; Data Analysis.		
Course objectives	<ul style="list-style-type: none"> <li>- Understand fundamental concepts and techniques in Natural Language Processing (NLP).</li> <li>- Develop practical skills in implementing NLP algorithms and models.</li> <li>- Apply NLP techniques to analyze and process textual data for various applications.</li> <li>- Gain insight into the ethical considerations and challenges in NLP.</li> </ul>		
Course learning outcomes	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">Competency level</th> <th style="text-align: center; padding: 5px;">Course learning outcome (CLO)</th> </tr> </thead> </table>	Competency level	Course learning outcome (CLO)
Competency level	Course learning outcome (CLO)		

	Knowledge	CLO1. Apply core NLP concepts to analyze and preprocess textual data effectively																												
	Skill	CLO2. Implement NLP models and algorithms to solve language-related tasks. CLO3: Evaluate the performance of NLP techniques and models using appropriate metrics																												
	Attitude	CLO 4. Examine ethical considerations and challenges in NLP applications.																												
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Introduction</td> <td>2</td> <td>I, T</td> </tr> <tr> <td>Text Preprocessing</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Language Modeling</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Sentiment classification</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Logistic Regression</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Vector Semantics and Embedding</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Neural Networks and Neural Language Models</td> <td>2</td> <td>T, U</td> </tr> <tr> <td>Machine Translation (optional)</td> <td>1</td> <td>T, U</td> </tr> </tbody> </table>			Topic	Weight	Level	Introduction	2	I, T	Text Preprocessing	2	T, U	Language Modeling	2	T, U	Sentiment classification	2	T, U	Logistic Regression	2	T, U	Vector Semantics and Embedding	2	T, U	Neural Networks and Neural Language Models	2	T, U	Machine Translation (optional)	1	T, U
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Neural Networks and Neural Language Models	2	T, U																												
Machine Translation (optional)	1	T, U																												
Examination forms	Multiple-choice questions, short-answer questions																													
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																													
Reading list	<ol style="list-style-type: none"> <li>1. Daniel Jurafsky, James H. Martin. (2018). Speech and Language Processing, 2nd Edition. Prentice Hall.</li> <li>2. Daniel Jurafsky, James H. Martin. (2023 ed. draft). Speech and Language Processing, 3rd Edition.</li> <li>3. Additional research papers and online resources provided during the course</li> </ol>																													

## 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:

	<b>SLO</b>
--	------------

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

### 3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessmen ts	Learning activities	Resources
1-2	Introduction	1	Quiz	Lecture, Discussion	[1, 2]. Chapter 1
3-4	Text Preprocessing	1	Quiz/exercise	Lecture, In-class quiz	[1,2]. Chapter 2; [3]
5-6	Language Modeling	2, 3	Quiz/exercise	Lecture, Discussion	[1,2]. Chapter 3; [3]
7-8	Sentiment classification	2, 3	Quiz/exercise	Lecture, In-class quiz	[1,2]. Chapter 4; [3]
<b>Mid-term Exam</b>					
9-10	Logistic Regression	2, 3	Quiz/exercise	Lecture, In-class quiz	[1,2]. Chapter 5; [3]
11-12	Vector Semantics and Embedding	1, 3	Quiz/exercise	Lecture, In-class quiz	[1,2]. Chapter 6; [3]
13-14	Neural Networks and Neural Language Models	1, 3, 4	Quiz/exercise	Lecture, In-class quiz	[1,2]. Chapter 7; [3]
15	Machine Translation (optional)	1, 3, 4	Discuss	Group	[1,2]. Chapter 13; [3]

### Laboratory

Week	Lab
1-2	Text Preprocessing
3	Language Modeling
4	Sentiment classification
5	Vector Semantics and Embedding
6-7	Neural Networks and Neural Language Models
8	Test Final

#### 4. Assessment plan

Assessment Type	CLO 1	CLO 2	CLO 3	CLO 4
Labs (10%)	30%		70%	
Assignment (20%)		20%	50%	30%
Midterm examination (30%)	50%	50%		
Final examination (40%)		40%	60%	

#### 5. Rubrics (optional)

##### 5.7. Grading checklist

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

##### 5.8. 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.

### 5.9. Analytic rubric

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

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

<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective , thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications)	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

		are identified clearly.	
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*Source: Association of American Colleges and Universities*

**Date revised: May 12, 2023**

Ho Chi Minh City, 26/08/2023   
**Dean of School of Computer Science and Engineering**



**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 advisor)						
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 product CLO 3. Have a good preparation to develop and improve the product in the thesis.						
<table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO1</td></tr> <tr> <td>Skill</td><td>CLO1, CLO2</td></tr> </tbody> </table>		Competency level	Course learning outcome (CLO)	Knowledge	CLO1	Skill	CLO1, CLO2
Competency level	Course learning outcome (CLO)						
Knowledge	CLO1						
Skill	CLO1, CLO2						

	Attitude	CLO3		
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: in the whole semester.</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>			
	Topic	Weight	Level	
	Find out/define a topic of the subject	3	U	
	Review and evaluate existing issues/problems	8	U	
	Research and propose some solutions	8	U	
	Deploy some main functions or new features for the product project	8	U	
	Testing and evaluating solutions or products	8	U	
	Write a report	10	U	
Examination forms	Multiple-choice questions, short-answer questions			
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the appointments with lecturer. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Tasks: Students must have more than 50/100 points overall to pass this course.</p>			
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		X				
2		X				X
3			X			

## 3. Planned learning activities and teaching methods

Week	Topic	CLO	Assessments	Learning activities	Resources
1	Find out the topic of the subject	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 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	<b>Final grade</b>				

#### 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/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			

Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

### 5.2. Holistic rubric

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

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

### 5.3. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.

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

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

Source: Association of American Colleges and Universities

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

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

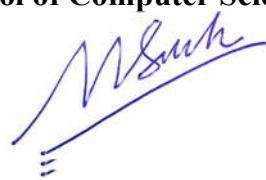
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or	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	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	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/

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

*Source: Association of American Colleges and Universities*

**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: 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.

	<p>CLO 2. Develop practical products or run product development projects in industry  CLO 3. Follow requirements/regulations and laws</p> <table border="1"> <thead> <tr> <th>Competency level</th><th>Course learning outcome (CLO)</th></tr> </thead> <tbody> <tr> <td>Knowledge</td><td>CLO1, CLO2</td></tr> <tr> <td>Skill</td><td>CLO1, CLO2</td></tr> <tr> <td>Attitude</td><td>CLO3</td></tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1, CLO2	Skill	CLO1, CLO2	Attitude	CLO3										
Competency level	Course learning outcome (CLO)																		
Knowledge	CLO1, CLO2																		
Skill	CLO1, CLO2																		
Attitude	CLO3																		
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: within 3 months</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table border="1"> <thead> <tr> <th>Topic</th><th>Weight</th><th>Level</th></tr> </thead> <tbody> <tr> <td>Introduction of the internship place</td><td>9</td><td>U</td></tr> <tr> <td>Review the existing issues of an assigned project</td><td>9</td><td>U</td></tr> <tr> <td>Study and solve some issues in product development</td><td>9</td><td>U</td></tr> <tr> <td>Implement some new functions or features for the project product</td><td>9</td><td>U</td></tr> <tr> <td>Presentation</td><td>9</td><td>U</td></tr> </tbody> </table>	Topic	Weight	Level	Introduction of the internship place	9	U	Review the existing issues of an assigned project	9	U	Study and solve some issues in product development	9	U	Implement some new functions or features for the project product	9	U	Presentation	9	U
Topic	Weight	Level																	
Introduction of the internship place	9	U																	
Review the existing issues of an assigned project	9	U																	
Study and solve some issues in product development	9	U																	
Implement some new functions or features for the project product	9	U																	
Presentation	9	U																	
Examination forms	Multiple-choice questions, short-answer questions																		
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																		
Reading list																			

## 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 O	1	2	3	4	5	6
1		X				X
2		X				X

3				X	X	
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### 3. Planned learning activities and teaching methods

Week	Topic	CL O	Assessments	Learning activities	Resources
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	<b>Final grade</b>				

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

<b>Organization (10%)</b>				
Distinct introduction, body, conclusions		5		
Content clearly and logically organized, good transitions		5		
<b>Presentation (20%)</b>				
Correct spelling, grammar, and syntax		10		
Clear and easy to read		10		
<b>Quality of Layout and Graphics (10%)</b>		10		
<b>TOTAL SCORE</b>		100		

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

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

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

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

Source: Association of American Colleges and Universities

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

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

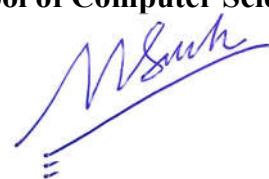
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or	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	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	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/

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

*Source: Association of American Colleges and Universities*

**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: 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 outcome (CLO)																								
		Knowledge	CLO1																								
		Skill	CLO1, CLO2																								
		Attitude	CLO3																								
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: in the whole last semester</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>																										
	<table border="1"> <thead> <tr> <th>Topic</th> <th>Weight</th> <th>Level</th> </tr> </thead> <tbody> <tr> <td>Find out the thesis topic</td> <td>4</td> <td>U</td> </tr> <tr> <td>Review and evaluate existing issues</td> <td>20</td> <td>U</td> </tr> <tr> <td>Research and propose some solutions</td> <td>30</td> <td>U</td> </tr> <tr> <td>Deploy the thesis product</td> <td>40</td> <td>U</td> </tr> <tr> <td>Testing and evaluating solutions or products</td> <td>40</td> <td>U</td> </tr> <tr> <td>Thesis defense</td> <td>1</td> <td>U</td> </tr> </tbody> </table>						Topic	Weight	Level	Find out the thesis topic	4	U	Review and evaluate existing issues	20	U	Research and propose some solutions	30	U	Deploy the thesis product	40	U	Testing and evaluating solutions or products	40	U	Thesis defense	1	U
Topic	Weight	Level																									
Find out the thesis topic	4	U																									
Review and evaluate existing issues	20	U																									
Research and propose some solutions	30	U																									
Deploy the thesis product	40	U																									
Testing and evaluating solutions or products	40	U																									
Thesis defense	1	U																									
Examination forms	Multiple-choice questions, short-answer questions																										
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																										
Reading list																											

## 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 O	1	2	3	4	5	6
1	X	X				
2	X	X				X
3			X			

### 3. Planned learning activities and teaching methods

Wee k	Topic	CL O	Assessments	Learning activities	Resources
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	<b>Final grade</b>				

### 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: .....		Evaluator: .....	
Max.	Score	Comments	
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		
Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		

<b>Organization (10%)</b>				
Distinct introduction, body, conclusions		5		
Content clearly and logically organized, good transitions		5		
<b>Presentation (20%)</b>				
Correct spelling, grammar, and syntax		10		
Clear and easy to read		10		
<b>Quality of Layout and Graphics (10%)</b>		10		
<b>TOTAL SCORE</b>		100		

## 5.2. Holistic rubric

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

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

## 5.3. Analytic rubric

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

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

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

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

Source: Association of American Colleges and Universities

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

	Capstone	Milestone		Benchmark
	4	3	2	1
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the	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.

	presentation cohesive.			
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally

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

Source: Association of American Colleges and Universities

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: Special Study of the Field 2**  
**Course Code: IT168IU**

**1. General information**

Course designation	This advanced course builds upon the concepts learned in the “Special Study of the Field” course and guides students in conducting more advanced research. The course is designed to develop students’ research, analysis, and presentation skills.				
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)	(Total workload: 90 hours Contact hours (laboratory session): 5 Private study including examination preparation, specified in hours: 85				
Credit points	Number of credits: 3 Lecture: 0 Laboratory: 3				
Required and recommended prerequisites for joining the course	Special Study of the Field				
Course objectives	This course allows students to select a subject under faculty guidance. Projects allow students to delve into advanced research and practical applications within their field of study, offering an alternative to the traditional thesis. Students will develop in-depth knowledge and skills while focusing on a specific topic of their choice.				
Course learning outcomes	<p>CLO 1. Analyze and synthesize advanced topics within the field.  CLO 2. Design and implement complex system architectures for application products.  CLO 3. Develop a comprehensive strategy to enhance and optimize the product in the project.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Competency level</th> <th style="text-align: center;">Course learning outcome (CLO)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Knowledge</td> <td style="text-align: center;">CLO1</td> </tr> </tbody> </table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1
Competency level	Course learning outcome (CLO)				
Knowledge	CLO1				

		Skill	CLO1, CLO2			
		Attitude	CLO3			
Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: in the whole semester.</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p>					
	Topic	Weight	Level			
	Advanced research methodologies and techniques	5	U			
	In-depth problem analysis and solution proposal	10	U			
	Advanced system design and implementation	15	U			
	Integration of cutting-edge technologies	10	U			
	Performance optimization and testing	10	U			
	Comprehensive project development	20	U			
	Write a report and Project presentation	30	U			
Examination forms	Short/long-answer questions					
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the appointments with lecturer. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Tasks: Students must have more than 50/100 points overall to pass this course.</p>					
Reading list	<p>Related works and books</p> <p>Advanced research papers, academic journals, and industry publications.</p>					

## 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 O	1	2	3	4	5	6
1	X					
2		X				X
3			X			

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	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

### 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)

#### 5.4. Grading checklist

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

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

### 5.5. Holistic rubric

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

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

### 5.6. Analytic rubric

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

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
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			undetermined, and/ or backgrounds unknown.	
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
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	establishes the presenter's credibility/ authority on the topic.	credibility/ authority on the topic.	credibility/ authority on the topic.	authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

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



**Assoc.Prof. Nguyen Van Sinh**

