MINISTRY OF EDUCATION AND TRAINING
HO CHI MINH CITY OPEN UNIVERSITY

COURSE SYLLABUS

I. GENERAL INFORMATION

1. Course title in Vietnamese: **LẬP TRÌNH MẠNG**
2. Course title in English: **NETWORK PROGRAMMING**
3. Knowledge / skill categorization:

☐General knowledge ☒Specialized knowledge

☐Basic knowledge ☐Supplementary knowledge

☐Professional knowledge ☐Graduate project / thesis

4. Number of credits

Total	Theory	Practice	Self-study
3	2	1	3 (2, 1, 5)

5. In charge of course

a) Faculty / Department / Sub-Department: Information Technology

b) Faculty: MSc. Luu Quang Phuong

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II. COURSE INFORMATION

1. Course description

This course provides students with basic knowledge and skills about a network application model and network application programming through a socket programming interface.

The course also introduces a number of libraries that support network programming in an object-oriented approach so that students can have the ability to develop network applications based on a socket programming interface (Windows Socket API - Winsock API) with supporting libraries.

2. Course conditions

#	Course conditions	Course code
1.	Prerequisites	
	None	
2.	Previous courses	
	Programming techniques	ITEC2503
3.	Parallel courses	MISY2501
	None	

3. Course objectives (COs)

The course will provide students with ability to:

Course objectives (CO)	Description	Related Program Learning Outcomes (PLO)
CO1 (Knowledge)	- Understand network application patterns. - Understand the meaning of network application protocols. - Mastering the basic knowledge of network programming and the process of building and developing network applications.	PLO4.6, PLO5.5
CO2 (Skills)	- Presentation of all types of program architecture. - Applying the characteristics of the Socket programming utility on TCP, UDP, and Multicast to program network applications. - Ability to develop a network application according to a predefined protocol based on a socket programming interface and introduced support libraries. - Designing, programming and deploying network applications according to defined protocols. - Ability to design and develop network application programming with popular programming languages (C ++, C #, Java ...).	PLO04.6,PLO05.5, PLO09.2

CO3 (Attitude)	- Recognize the importance of the subject. - Have the spirit of self-study, self-improvement of knowledge. - Ability to program and develop network applications - Having a sense of and ability to self-study and research to improve the understanding of network programming models and interfaces applied to application development.	PLO13.1, PLO13.2, PLO13.3

4. Course learning outcomes (CLOs)

After completing this course, students are able to:

Course objectives (CO)	Course learning outcomes (CLO)	Description
CO1	CLO1.1	- Understand network application patterns. - Understand the meaning of network application protocols.
	CLO1.2	Mastering the basic knowledge of network programming and the process of building and developing network applications.
CO2	CLO2.1	- Presentation of all types of program architecture. - Take advantage of the Socket programming utility on TCP, UDP, and Multicast to program network applications.
	CLO2.2	- Ability to develop a network application according to a predefined protocol based on a socket programming interface and introduced support libraries. - Designing, programming and deploying network applications according to defined protocols. - Ability to design and develop network application programming with popular programming languages (C ++, C #, Java ...).
CO3	CLO3.1	- Recognize the importance of the subject. - Have the spirit of self-study, self-improvement of knowledge.

Matrix of Course Learning Outcomes (CLOs) and Program Learning Outcomes (PLOs):

	CLOs	PLO4.6	PLO5.5	PLO9.2	PLO13.1	PLO13.2	PLO13.3
	CLO 1.1						
	CLO 1.2		**2**				
	CLO 2.1		**4**	**2**			
	CLO 2.2	**3**	**4**	**3**	**2**		
	CLO 3.1				**2**	**2**	**3**

1: Not supported
2: Partially supported
3: Supported
4: Highly supported
5: Totally supported

5. Course materials

a) *Textbooks*

[1] Sea Burns, Hands-On Network Programming with C# and .NET Core, Packt Publishing, 2019

[2] Elliotte Rusty Harold, Java Network Programming, O'Reilly Media, 2014.

b) *Reference materials*

[2] Bogdan Ciubotaru, Gabriel-Miro Muntean, Advanced Network Programming – Principles and Techniques, Springer, 2013.

[3] Kishori Sharan, Beginning Java 8 APIs, Extensions and Libraries: Swing, JavaFX, JavaScript, JDBC and Network Programming APIs (Expert's Voice in Java), Apress, 2014.

c) *Software*

Microsoft Windows, Microsoft Visual Studio 2015, Eclipse, Java NetBean.

6. Course assessment

Components	Assessment	Timing	Course learning outcomes (CLO)	Rate (%)
(1)	(2)	(3)	(4)	

A1. Process evaluation	A1.1 Computer test	Midterm	CLO1.1, CLO1.2, CLO2.1, CLO2.2, CLO3.1	50%
	Total			50%
A2. Final evaluation	A2.1 Computer test	Final	CLO1.1, CLO1.2, CLO2.1, CLO2.2, CLO3.1	50%
	Total			50%
Total				100%

7. Rubrics review

a) Midterm rubric (50%)

Criteria	CLO	Weight	Excellent	Good	Fair	Poor
Assessment of practicing on computer (3 questions)		**100%**				
Install and implement client-server applications. Build the applications with TCP/UDP protocols using socket programming.	1.2	20%	2	1-1.75	1	<1
	2.1	60%	6	4-6	2-4	<2
	2.2	20%	2	1-2	0.75 – 1	<0.75
Total		100%				

b) Final assessment rubric (50%)

Criteria	CLO	Weight	Excellent	Good	Fair	Poor
Assessment of practicing on computer (3 questions)		**100%**				
Master the basics of network programming and the process of building and developing network applications. Design, develop, and deploy network applications on socket programming interfaces with support libraries.	1.2	20%	2	1-1.75	1	<1
	2.1,2.2	60%	6	4-6	2-4	<2
	3.1	10%	1	0,5-1	0,5	<0.5
Total		100%				

8. Teaching plans

Teaching plans for theory (4.5 class-time unit per session)

Week/session	Content	CLO	Teaching and learning activities	Reviews / Assessment	Main documents and references
(1)	(2)	(3)	(4)	(5)	(6)
1.Week 1/ Theory Session 1	Chapter 1: Overview 1.1 Protocol family TCP / IP 1.1.1 Stratified architecture 1.1.2 IP address 1.1.3 Protocol TCP, UDP 1.2 Model of application 1.3 Network programming interface 1.3.1 Windows Socket API 1.3.2 Some object-oriented libraries Chapter 2: Winsock Programming 2.1. Basic concept 2.1.1 Winsock programming interface 2.1.2 Introducing the Winsock library	CLO 1.1	Lecturers: + Introduction to detailed outline. + Lecture + Ask questions, exercises. + Emphasize the main points. + Outline the requirements for the next class. Student: + Learning in class: listening to lectures, answering questions, solving the posed exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge. + On LMS system: answer theoretical multiple-choice questions, participate in discussion on forums.	A1.1	[Chapter 1]

2.Week 2/ Theory Session 2	2.3. Operation modes 2.3.1. Blocked / not blocked 2.3.2. Asynchronous processing model 2.4. Application illustration	CLO 4.2, CLO 4.6, CLO 5.5	Lecturers: + Lecture + Ask questions, exercises. + Emphasize the main points. + Outline the requirements for the next class. Student: + Learning in class: listening to lectures, answering questions, solving the posed exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge. + On LMS system: answer theoretical multiple-choice questions, participate in discussion on forums.	A1.1 A2.1	[1] Chapter 1 [2] Chapter 5.6 [3] Chapter 5
3. Week 3/ Theory Session 3	2.4.1. Simple communication application in client / server model 2.4.2. Application according to self-defined protocol 2.4.3. Object Oriented Libraries in socket programming Exercise group to deploy the Windows	CLO 1.1, CLO 1.2	Lecturers: + Lecture + Ask questions, exercises. + Emphasize the main points. + Outline the requirements for the next class. Student: + Learning in class: listening to	A1.1 A2.1	[1] Chapters 8, 9, 12,13 [2] Chapter 8.9 [3] Chapter 5

	socket Client / Server programming application program		lectures, answering questions, solving the posed exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge. + On LMS system: answer theoretical multiple-choice questions, participate in discussion on forums		
4. Week 4/ Theory Session 4	Chapter 3: Building network applications. 3.1. Application-level protocol 3.1.1 FTP 3.1.2 HTTP	CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2	Lecturers: + Lecture + Ask questions, exercises. + Emphasize the main points. + Outline the requirements for the next class. Student: + Learning in class: listening to lectures, answering questions, solving the posed exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge.	A1.1 A1.2	[1] Chapters 8, 9, 12,13 [2] Chapter 8.9 [3] Chapter 5

			+ On LMS system: answer theoretical multiple-choice questions, participate in discussion on forums		
5.Week 5/ Theory Session 5	Chapter 3: 3.1.3 SMTP, CLOP3, IMAP4 3.2. Build application according to protocol	CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2	Lecturers: + Lecture + Ask questions, exercises. + Emphasize the main points. + Outline the requirements for the next class. Student: + Learning in class: listening to lectures, answering questions, solving the posed exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge. + On LMS system: answer theoretical multiple-choice questions, participate in discussion on forums	A1.1 A1.2	[1] Chapters 8, 9, 12,13 [2] Chapter 8.9 [3] Chapter 5
6.Week 6/ Theory Session 6	3.3 Libraries support. 3.3.1. WinInet 3.3.2. .NET	CLO 1.1, CLO 1.2, CLO	Lecturers: + Lecture + Ask questions, exercises.	A1.1 A2.1	[1] Chapter 13 [2] Chapter 10

	Group exercises to build network applications. Chapter 4: Remote service access 4.1. Concept 4.2. Solution supporting remote service access	2.1, CLO 2.2 CLO 3.1	+ Emphasize the main points. + Outline the requirements for the next class. Student: + Learning in class: listening to lectures, answering questions, solving the posed exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge. + On LMS system: answer theoretical multiple-choice questions, participate in discussion on forums		
7.Week 7/ Theory Session 7	Chapter 4: Remote service access 4.3. Application development 4.3.1. Web Service 4.3.2. Remoting Group exercises to build network applications.	CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2 CLO 3.1	Lecturers: + Lecture + Ask questions, exercises. + Emphasize the main points. + Outline the requirements for the next class. Student: + Learning in class: listening to lectures, answering questions, solving the posed	A1.1 A2.1	[1] Chapter 13 [2] Chapter 10

			exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge. + On LMS system: answer theoretical multiple-choice questions, participate in discussion on forums		

Teaching plans for practices (3.0 class-time units per session)

Week/session (1)	Content (2)	CLO (3)	Teaching and learning activities (4)	Reviews / Assessment (5)	Main documents and references
1.Week 1 / Practice Session 1	Winsock programming	CLO 1.1, CLO 1.2	Lecturers: + Reminds the main issues. + Guide students to implement. + Answering questions of students. Student: + Learning in class: listening to lectures, answering questions, solving the posed exercises, taking notes. + Study at home: watch lectures, summarize key knowledge, learn related knowledge. + On LMS system: answer theoretical multiple-choice	A1.1	[6] Chapter 1 [2] Chapter 12

			questions, participate in discussion on forums.		
2.Week 2 / Practice Session 2	Winsock programming	CLO 1.1, CLO 1.2	Lecturers: + Reminds the main issues. + Guide students to implement. + Answering questions of students. Student: + Study in class: listening to lectures, taking notes, asking questions, doing homework. + Study at home: watch lectures, prepare exercises and practice repeatedly, find out additional materials and exercises. + On LMS system: participate in answering theoretical review questions, participate in submitting exercises online (if any), participate in discussion forums	A1.1	[1] Chapter 3, 4 [2] Chapter 10, 15 [3] Chapter 6
3.Week 3 / Practice Session 3	+ Programming Winsock - + Network application + Report on group exercises to deploy Windows Client / Server socket programming application program.	CLO 1.1, CLO 1.2, CLO 2.1	Lecturers: + Reminds the main issues. + Guide students to implement. + Answering questions of students. Student: + Study in class: listening to lectures, taking notes, asking	A1.1	[4] Chapter 1,2

			questions, doing homework. + Study at home: watch lectures, prepare exercises and practice over and over again, find out additional materials and exercises. + On LMS system: participate in answering theoretical review questions, participate in submitting exercises online (if any), participate in discussion forums		
4.Week 4/ Practice 4	Building network applications	CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2	Lecturers: + Reminds the main issues. + Guide students to implement. + Answering questions of students. Student: + Study in class: listening to lectures, taking notes, asking questions, doing homework. + Study at home: watch lectures, prepare exercises and practice repeatedly, find out additional materials and exercises. + On LMS system: participate in answering theoretical review questions, participate in submitting exercises online (if any),	A1.1	[4] Chapter 3,4

			participate in discussion forums		
5.Week 5/ Practice 5	Building network applications Report the group exercise to build network applications.	CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2, CLO 3.1	Lecturers: + Reminds the main issues. + Guide students to implement. + Answering questions of students. Student: + Study in class: listening to lectures, taking notes, asking questions, doing homework. + Study at home: watch lectures, prepare exercises and practice over and over again, find out additional materials and exercises. + On LMS system: participate in answering theoretical review questions, participate in submitting exercises online (if any), participate in discussion forums	A1.1	[4] Chapter 5
6.Week 6/ Practice 6	+ Building network applications (cont.) + Remote service access	CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2, CLO 3.1	479 / 5000 Lecturers: + Reminds the main issues. + Guide students to implement. + Answering questions of students. Student: + Study in class: listening to lectures, taking notes, asking	A1.1	[4] Chapter 5

			questions, doing homework. + Study at home: watch lectures, prepare exercises and practice over and over again, find out additional materials and exercises. + On LMS system: participate in answering theoretical review questions, participate in submitting exercises online (if any), participate in discussion forums		
7.Week 7/ Practice 7	+ Remote service access + Report on group exercises to develop network applications	CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2, CLO 3.1 CLO 1.1, CLO 1.2, CLO 2.1, CLO 2.2 CLO 3.1	Lecturers: + Reminds the main issues. + Guide students to implement. + Answering questions of students. Student: + Study in class: listening to lectures, taking notes, asking questions, doing homework. + Study at home: watch lectures, prepare exercises and practice repeatedly, find out additional materials and exercises. + On LMS system: participate in answering theoretical review questions, participate in submitting exercises online (if any),	A1.1	[5] Chapter 1,2

			participate in discussion forums		

9. Course regulations

- Students who do not submit their homework and report assignments on time on the LMS are deemed not to submit their works.

- Students who are absent more than 20% of the total practice sessions are not allowed to take part in the mid-term exam on the computer.

DEAN OF FACULTY	**EDITOR**
(Sign and specify full name)	*(Sign and specify full name)*
Dr. Le Xuan Truong	MSc. Luu Quang Phuong