

COURSE SYLLABUS

CSC10008 – Computer Networking

1. GENERAL INFORMATION

Course name:	Computer Networking
Course name (in Vietnamese):	Mạng máy tính
Course ID:	CSC10008
Knowledge block:	
Number of credits:	4
Credit hours for theory:	45
Credit hours for practice:	30
Credit hours for self-study:	90
Prerequisite:	
Prior courses:	Introduction to Computer Science, Introduction to Programming
Instructors:	

2. COURSE DESCRIPTION

The course objectives include learning about computer network organization and implementation, obtaining a theoretical understanding of data communication and computer networks. This course consists of computer network architectures, protocol layers, network programming, transmission media, encoding systems, switching, network routing, congestion control, flow control, transport protocols, network security.

3. COURSE GOALS

At the end of the course, students are able to

ID	Description	Program LOs
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G1	Ability to work at the individual and team level to present problems in the Computer Networking.	2.1.1, 2.2.1, 2.2.2, 2.3.1
G2	Ability to understand and interpret English terminology in Computer Networking.	2.4.3, 2.4.5
G3	Ability to analyze and think at the system level.	4.1.3, 4.3.2
G4	Identify and classify the basics of the Computer Networking.	1.3.6, 1.4
G5	Understand and provide solutions to basic network problems. Use basic algorithms learned to solve real problems.	5.1.1, 5.1.3, 5.2.1, 5.2.2, 5.3.1, 6.1.1
G6	Design, deploy, and build a number of small computer networks.	5.1.3, 5.2.2, 5.3.2, 6.1.2

4. COURSE OUTCOMES

CO	Description	I/T/U
G1.1	Team formation, organization, operation, and management.	I, T
G1.2	Participate in group discussion and debate on subject matter.	U
G1.3	Analyze, synthesize, and document individual project reports or collaborate on a team.	I, T
G2.1	Know and understand specialized English terminology of the subject.	I
G2.2	Read and understand English materials related to lectures.	I
G3.1	Explain the basics of computer networks: circuit switching networks, packet switching networks, TCP, UDP, DNS, DHCP, NAT, ...	I, T

G3.2	Know the roles, responsibilities and professional ethics while working.	I
G3.3	Know how to update new knowledge, self-study, self-develop and adapt.	I
G4.1	Distinguish the differences between the basic problems in the Computer Networking.	I, T
G5.1	Design and build a computer network.	I, T,U
G5.2	Use basic algorithms learned to solve real problems.	I, T, U
G6.1	Analyze the problem and model the problem.	I, T, U

5. TEACHING PLAN

ID	Topic	Course outcomes	Teaching/Learning Activities (samples)
1	Introduction <ul style="list-style-type: none"> Basic concepts History of the Internet OSI Model TCP/IP Model 	G1.2, G2.1, G3.1, G3.2, G3.3	Lecturing Q&A, Group discussion QZ1: Quiz 1 (Chapter 1)
2	Application Layer <ul style="list-style-type: none"> DHCP, DNS, HTTP, FTP Socket Programming 	G2.1, G2.2, G4.1, G5.1	Lecturing Demonstration, Q&A QZ2: Quiz 2

3	Transport Layer <ul style="list-style-type: none"> • UDP • TCP 	G1.1, G1.3, G2.1, G3.2, G5.1, G6.1	Lecturing Demonstration, discussion
4	Network Layer <ul style="list-style-type: none"> • IP address • IP protocol • Routing • Router • ICMP • NAT 	G1.1, G1.3, G2.1, G3.2, G4.1, G5.1, G6.1	Lecturing Demonstration, discussion
5	Data Link Layer <ul style="list-style-type: none"> • Parity check, checksum, CRC • TDM,FDM,CDMA, ALOHA,CSMA • ARP • Switch • Ethernet 	G1.2, G2.1, G4.1, G5.1, G6.1	Lecturing Demonstration
6	Network Media <ul style="list-style-type: none"> • Wired networks • Wireless networks 	G2.1, G5.2, G6.1	Question & answer Case study and discussion
11	Review	G2.1, G3.1, G3.2, G3.4, G4.1, G5.1, G5.2, G5.3, G5.4	Lecturing Q&A, Discussion Project submitted

For the practical laboratory work, there are 10 weeks which cover similar topics as it goes in the theory class. Each week, teaching assistants will explain and demonstrate key ideas on the corresponding topic and ask students to do their lab exercises either on computer in the lab or at home. All the lab work submitted will be graded. There would be a final exam for lab work.

6. ASSESSMENTS

ID	Topic	Description	Course outcomes	Ratio (%)
A1	Assignments			10%
A11	Quizzes	Small quizzes in class for each topic		5%
A12	Homeworks	reading comprehension and practicing based on knowledge taught in class		5%
A2	Projects			30%
A21	Project: Capture and analyse packets with Wireshark	Understanding the TCP/IP model and protocols of each layer better using Wireshark tool		10%
A22	Project: Design and configure networks with Packet Tracer	Design a network using the Cisco Packet Tracer tool, configure the network so that it can work properly		10%
A23	Project: Socket programming	Create a network application using Socket.		10%

A3	Exams			60%
A31	Mid-term exam	Describe the understanding of different topics, analyze & program to solve problems.		20%
A32	Final exam	Opened book exam. Describe the understanding of different topics, analyze & program to solve problems.		40%

7. RESOURCES

Textbooks

- **Computer Networking** – by Mai Văn Cường - Trần Trung Dũng - Trần Hồng Ngọc - Lê Ngọc Sơn - Lê Giang Thanh - Trương Thị Mỹ Trang - Đào Anh Tuấn, 1st edition, 2015
- **Computer Networking: A Top-Down Approach** – by James F. Kurose, Keith W. Ross - Addition Wesley – 7th edition, 2017.

Others

- **Computer Networks, Fourth Edition** – by Andrew S. Tanenbaum - Prentice Hall – 2003

8. GENERAL REGULATIONS & POLICIES

- All students are responsible for reading and following strictly the regulations and policies of the school and university.
- A student must have submissions for each of 3 parts of assessment A1, A2, A3 to pass the course.
- Students who are absent for more than 3 theory sessions are not allowed to take the exams.
- For any kind of cheating and plagiarism, students will be graded 0 for the course. The incident is then submitted to the school and university for further review.



- Students are encouraged to form study groups to discuss on the topics. However, individual work must be done and submitted on your own.
- The number of assignments may vary depending on the class' situation.