COURSE SYLLABUS

COMPUTER NETWORKS

Course code: 220018

1. General information

Course type		*Number of credits*	*Number of learning periods*
General ☐ Basic ☑ Specialized ☐ Required ☑ Elective ☐		Theory: 02 Exercise: Practice: 01	Theory: 30 Exercise: Practice: 30

Learners:

Level	Bachelor
Discipline	Information Technology

Course requirements:

Prerequisites	Computer Architecture
Parallels	None
Other requirements	None

2. Learning resources

Books	[1] Dương Ngọc Vân Khanh, *Tài liệu giảng dạy Mạng máy tính*, Đại học Trà Vinh, 2013.
References	[2] CCNA v6.0, *CCNA Routing and Switching: Introduction to Networks*. Cisco Academy, 2018.
Other learning materials	[3] VMware, Inc (2014). *Vmware Worksation 9.0.* [4] Cisco Academy (2019). *Cisco Packet Tracer 7.2*. [5] https://www.quantrimang.com/ [6] https://networklessons.com/

3. Course description

The course provides students basic knowledge of computer networks such as network protocols, components and characteristics of LANs, WANs, the Internet and layered communication architectures (OSI and TCP/IP).

The course also aims to provide skills to config, operate various network devices (NIC, Bridge, Switch, Router…) and set up a small network in practice.

Additionally, the course develops students' appropriate awareness and attitudes on the roles of self-study and soft skills improvement such as group working and report presentation.

4. Course learning outcomes (CLOs)

After finishing the course, students will be able to:

		Satisfy LOs of the program	Satisfy LOs of the ABET
❖ **Topic 1: Disciplinary Knowledge and Reasoning**			B.1.1
L1.	Present the overview of computer networks	1.2.5	B.1.2
L2.	Explain the encapsulation/de-encapsulation procedure in the OSI reference model		B.1.3
L3.	Apply IPv4 and IPv6 address	1.2.6	B.1.4 B.1.5 B.1.6
L4.	Discriminate transmission media and network devices	1.2.5	
L5.	Compare LAN technologies		
L6.	Compare WAN technologies		
L7.	Understand the operation of Internet services		
L8.	Present network security solutions		
❖ **Topic 2: Personal and Professional Skills and Attributes**			
L9.	Modeling the problem	2.1.2	
L10.	Hypothesis Formulation	2.2.1	
L11.	Emergence and Interactions in Systems	2.3.2	
L12.	Evaluation computer network system	2.3.4	
❖ **Topic 3: Interpersonal Skills: Teamwork and Communication**			

L13.	Forming Effective Teams	3.1.2	
L14.	Multimedia Communication	3.2.4	
L15	Communications in English	3.3.1	
L16.	Apply English for Information Technology	3.3.2	
❖ *Topic 4: Conceiving, Designing, Implementing and Operating Systems in The Enterprise, Societal and Environmental Context – The Innovation Process*			
L17.	The responsibilities of engineers to society and a sustainable future	4.1.1	
L18.	Identify requirements	4.2.1	
L19.	Defining function, concept and architecture	4.2.2	
L20.	Utilization of knowledge in design	4.3.3	
L21.	Development Project Management	4.3.4	
L22.	The Design Process Phasing and Approaches	4.4.2	

5. Course content

Course content	CLOs	Number of learning periods		
		Theory	**Practice**	**Others**
Chapter 1. Introduction to Computer Networks	**L1**	**4**	**0**	
1.1. Concepts and classification computer networks				
1.2. Network handling models				
1.3. Network management models				
1.4. Models of network applications				
1.5. Computer network services				
1.6. The benefits of computer networks				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				

☐ *CDIO in the enterprise, societal and environmental context*				
Chapter 2. The OSI Reference Model	**L2**	**4**	**0**	
2.1. Introduction to network protocols				
2.2. Encapsulation/ de-encapsulation procedure in OSI reference model				
2.3. The TCP/IP protocol model				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*				
Chapter 3. IP Address	**L3**	**8**	**8**	
3.1. The overview of IPv4 address				
3.2. The concepts of IPv4 protocol				
3.3. IPv4 classes				
3.4. Subnetting				
3.5. Network Address Translation				
3.6. The overview of IPv6 Address				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*				
Chapter 4. Network Devices and Transmission Media	**L4**	**4**	**5**	
4.1. Introduction to transmission media				
4.2. Type of network cables				
4.3. Wireless and wire transmission				

4.4. Network devices				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*				
Chapter 5. LAN Architecture and Technologies	**L5**	**4**	**2**	
5.1. Introduction LAN architectures				
5.2. Type of network topology				
5.3. LAN technologies				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*	L8 (T)			
Chapter 6. WAN Technologies	**L6**	**2**	**5**	
6.1. Introduction WAN				
6.2. WAN technologies				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*				
Chapter 7. Internet Services	**L7**	**2**	**5**	
7.1. Web services				
7.2. FTP services				
7.3. Mail services				
☐ *Personal and Professional Skills and Attributes*				

☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*				
Chapter 8. Network Security	**L8**	**2**	**5**	
8.1. Issues related to network security				
8.2. The important role of network security				
8.3. Network security solutions				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*				
Summary of skills in course level				
☐ *Personal and Professional Skills and Attributes*				
☐ *Interpersonal Skills: Teamwork and Communication*				
☐ *CDIO in the enterprise, societal and environmental context*				

6. Teaching and learning methods

ID	Teaching method/technique		Description
M1.	Lecturing	☒	
M2.	Questions – Answers	☒	
M3.	Group-based Learning	☒	
M4.	Problem-based Learning	☐	
M5.	Project-based Learning	☐	
M6.	Case studies	☒	
M7.	Role play	☐	

ID	Teaching method/technique		Description
M8.	Demo	☒	
M9.	Simulations	☐	
M10.	Debate	☒	
M11.	Game	☐	
M12.	Brainstorming	☒	
M13.	Think-Pair-Share	☒	

7. Course assessment

ID	Assessment activity		Quantity	Weight	LOs assessed
T1.	Text-based midterm exam	☒	01	25%	L1, L2
T2.	Text-based final exam	☒	01	25%	L4, L5, L6, L7, L8, L9, L10, L11, L12, L17, L18, L19, L20, L21, L22
T3.	Practice midterm exam	☐			
T4.	Practice final exam	☐			
T5.	Report	☐			
T6.	In-class exercises	☒	01	25%	L1, L3, L18, L19
T7.	Homework assignments	☒	01	25%	L1, L3, L18, L19
T8.	Question – Answer	☐			
T9.	Term Project	☒	01	25%	L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L12, L17, L18, L19, L20, L21, L22
T10.	Final Exam	☒	01	50%	L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L12, L17, L18, L19, L20, L21, L22

ID	Assessment activity		Quantity	Weight	LOs assessed
Overall score formula	Lecture can choose two or more form from (T1, T2, T6, T7, and T9) list to evaluate for midterm exam score. It accounts for 50% of the total course score. T10 accounts for the remaining 50%.				

8. Course requirements and expectations:

8.1. Requirements on attendance

- Students are responsible for attending in all classes. In case of absence due to force majeure circumstances, there must be sufficient and reasonable evidence.
- Students who do not attend more than 20% of the class sections, whether for reason or not, are deemed not to have completed the course and must re-enroll in the following semester.

8.2. Requirements and expectations on student behaviors

- Students must show their respects for teachers and other learners.
- Students must be on time. Students who are late more than five minutes will not be allowed to attend the class.
- Students should not make noise and interfere with others in the learning process.
- Students should not eat, chew gum, and use devices such as cell phones, music players during class hours.
- Laptops and tablets can only be used in class for the purpose of learning.
- Students who violate the above principles will be asked to leave the class and considered absent from the class.

8.3. Requirements on learning issues

Issues related to applying for score reservation, scoring complaints, scoring, exam disciplines are done according to the Learning Regulation of Tra Vinh University.

9. Tentative course instructor

Dương Ngọc Vân Khanh

   DEAN   **DEPARTMENT HEAD**   **LECTURER**

Dương Ngọc Vân Khanh