SYLLABUS

1. **Course name:** Data Communication Lab
2. **Course code:** LDAT411164E
3. **Credits:** 1 credits (0/1/2) (0 theoretical credits, 1 practical credit).
   Duration: 8 weeks (6 main periods and 12 self-study periods)/week).
4. **Instructors:**
   a. Primary instructor: Le Minh, M.Eng.
   b. Secondary instructors:
   - Dang Phuoc Hai Trang, M.Eng.
   - Nguyen Van Phuc, M.Eng.
   - Huynh Hoang Ha, M.Eng.
5. **Course conditions:**
   a. Prerequisites: N/A.
   b. Corequisites: Data Communication, Digital Systems Lab, Practice of Measurement Engineering.
6. **Course Description:**
   This course provides the basic skills such as: cable - press technology; use softwares to simulate line - coding; ability to analyze, install, test in the data transmission line, the baseband through different media.
7. **Course Goals**

Goals	Goal description *This course provides students:*	ELOs
G1	Ability to apply knowledge about communication engineering technology, data communication.	01 (M)
G2	Ability to analyze, explain and solve technical issues related to data transmission.	02 (M)
G3	Ability to work effectively as a member of teams, build industrial style.	06 (H), 08 (H), 9 (L)
G4	Ability to design and calculate simple data transmission systems.	03 (H), 07 (M) 10 (H), 11 (M)

** Note: H: **H**igh; M: **M**edium; L: **L**ow*

8. Course Learning Outcomes - CLOs:

CLOs		Description *After completing this course, students can have:*	ELOs
G1	G1.1	Represent the characteristics of the communication system; the types of connector, cable, line coding and digital modulation.	01
	G1.2	Presentation of data link protocols and data link controls.	01
G2	G2.1	Evaluate the data transmission system according to the relevant criteria.	02
	G2.2	Comparing advantages and disadvantages of line codings and digital modulations.	02
G3	G3.1	Ability to work in a team, formed industrial style.	06, 08, 09
G4	G4.1	Design and operation of the basic data transmission system.	11
	G4.2	Set up and use the software related to data transmission.	03, 10
	G4.3	Tests and measurements in the data communication experiments.	10
	G4.4	Ability to present standard essay papers.	03
	G4.5	A recognition of the need for continuous learning	07

9. Study materials:

a. Textbooks:

[1] Ngo Quoc Cuong, Data Communication Lab, 2013.

b. References:

[2] Nguyen Viet Hung, *Data Communication*, HCMUTE, 2012.

10. Student Assessments:

a. Grading points: 10

b. Planning for students assessment is followed:

Type	Contents	Line time	Assessment techniques	CLOs	Rates (%)
Test					**80**
M/P	Press the cable-end	Week 1	Assembling, measuring.	G1.1; G3.1, G4.3	20
M/P	Simulate line coding	Week 3	Assembling, measuring.	G1.1; G4.2 G2.2; G3.1	20
M/P	Data transfer via serial port	Week 5	Assembling, measuring.	G1.1; G1.2 G2.1; G3.1 G4.1; G4.3	20
M/P	Data transfer via MODEM	Week 7	Assembling, measuring.	G1.1; G1.2 G2.1; G3.1 G4.1; G4.3	20
Report					**20**
H/P	Average all reports	Week 1, 3, 5, 7	Report by individual / group	G3.1; G4.4; G4.3	20

** Note: Q: **Q**uiz; H: **H**omework; P: **P**roject; M: **M**idterm Exam; F: **F**inal Exam;*

11. Course details:

Week	Contents	CLOs
1	***Part 1:* Connector and Cable** *(0/6/12)*	
	Teaching contents: *(6)* 1.1 Research cables (twisted pair, coaxial cable, fiber optic cable) 1.2 Research connector (BNC, RJ11, RJ45, DB9, DB25) 1.3 Practice pressing the cable. **Teaching methods**: + Theoretical lectures. + Previous operation.	G1.1; G3.1; G4.3
	Self-study contents: *(12)* + Attenuation and bandwidth of the cables.	G1.1
2	***Part 2:* Simulating the Line Coding** *(0/6/12)*	
	Teaching contents: *(6)* 2.1 Introduction to software (MultiSim) 2.2 Simulate unipolar code circuit. 2.3 Simulate NRZ-L code circuit. 2.4 Simulate Manchester code circuit. 2.5 Simulate RZ code circuit. **Teaching methods**: + Theoretical lectures. + Group discussion. + Previous operation.	G1.1; G4.2 G2.2; G3.1
	Self-study contents: *(12)* + The 74166, 74163, 74HC14, 7407, 4052, 4077 datasheet	G1.1
3	***Part 2:* Simulating the Line Coding (*continuous*)** *(0/6/12)*	
	Teaching contents: *(6)* 2.6 Assembly unipolar code circuit. 2.7 Assembly NRZ-L code circuit. 2.8 Assembly Manchester code circuit. 2.9 Assembly RZ code circuit. **Teaching methods**: + Theoretical lectures. + Group discussion. + Previous operation.	G1.1 G2.2; G3.1
	Self-study contents: *(12)* + The line coding bandwidth.	G1.1
4	***Part 3:* Digital Data Transmission** *(0/6/12)*	
	Teaching contents: *(6)* 3.1 Overview data transmission use DB9 and RS232. 3.2 Data transmission with DataCom100 kit. **Teaching methods**: + Theoretical lectures.	G1.1; G1.2 G2.1; G3.1 G4.1; G4.3

	+ Previous operation.	
	Self-study contents: *(12)* + RS232- USB circuit.	G1.1
5	***Part 3:*** **Digital Data Transmission (*continuous*)** *(0/6/12)*	
	Teaching contents: *(6)* 3.3 Overview flow controls and transmission protocols 3.4 Data transmission with DCT03 kit. 3.5 Write HyperTerminal simulator. **Teaching methods**: + Theoretical lectures. + Previous operation.	G1.1; G1.2 G2.1; G3.1 G4.1; G4.3
	Self-study contents: *(12)* + Data transfer microcontroller – computer.	G1.1
6	***Part 4:*** **Data Transmission via PSTN** *(0/6/12)*	
	Teaching contents: *(6)* 4.1 V.90 Modem. 4.2 FX206/FX208 switchboard. **Teaching methods**: + Theoretical lectures. + Previous operation.	G1.1; G1.2 G2.1; G3.1 G4.1; G4.3
	Self-study contents: *(12)* + AT script.	G4.2; G4.3
7	***Part 4:*** **Data Transmission via PSTN (*continuous*)** *(0/6/12)*	
	Teaching contents: *(6)* 4.3 Data transmission with Modem100 kit. 4.4 Data transmission use Modem and Echange telephone. **Teaching methods**: + Theoretical lectures. + Previous operation.	G1.1; G1.2 G2.1; G3.1 G4.1; G4.3
	Self-study contents: *(12)* + Asterisk exchange.	G1.1
8	**Review**	

12. Learning ethics:

- Home assignments and projects must be done by the students themselves. Plagiarism found in the assessments will get zero point.
- Students who attend less than 80% or do not complete 80% of homework will be banned.

13. First approved date: 01/01/2012

14. Approval level

Dean	Department	Instructor
Nguyen Minh Tam, Ph.D	Nguyen Ngo Lam, M.Eng	

15. Syllabus updated process:

1st time: Updated content dated: 15/01/2014 *Contents:*	**Instructor:** **Head of department:** Vo Minh Huan, Ph.D
2nd time: Updated content dated*:* 15/01/2016 *Contents:*	**Instructor:** **Head of department:** Phan Van Ca, Ph.D
3rd time: Updated content dated*:* 06/05/2017 *Contents:*	**Instructor:** Dang Phuoc Hai Trang, M.Eng **Head of department:** Phan Van Ca, Ph.D