

	<p>HO CHI MINH UNIVERSITY OF TECHNOLOGY AND EDUCATION</p> <p>FACULTY OF ELECTRICAL AND ELECTRONICS ENGINEERING</p>	<p>Programme: Biomedical Engineering</p> <p>Programme Level: Undergraduate</p>
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Syllabus

1. **Course Name:** Digital Systems Lab
2. **Course Code:** PRDI1310263
3. **Credits:** 1 credits (0:1:2) (5-hour lab session and 10 hours of self-study per week)
4. **Course Instructor(s):**
 - A. Truong-Duy Nguyen, MEng
 - B. Duc-Dung Vo, MEng
 - C. A-Thoi Ha, BEng
 - D. Duy-Thao Nguyen, MEng
5. **Registration Requirements**
 - A. Pre-requisite Course(s): Digital systems
 - B. Previous Course(s): Basic Electronics; Practice Basic Electronics

6. Course Descriptions:

This course guides students to practice assembling digital electronic circuits such as logic gates, Flip-Flop, counters, registers, combinational and sequential circuit design, memory, analog-digital conversion, and application circuits in reality.

7. Course Learning Outcomes (CLOs)

CLOs	Descriptions	ELO(s)/PI(s)	Competency
	<i>After completing this module you should be able to:</i>		
CLO1	Basic knowledge and techniques of digital electronic circuits assembly.	ELO1/PI1.2	I
CLO2	Ability to use modern technical tools to perform practical exercises. Ability to analyze and test assembly of digital electronic circuits.	ELO2/PI2.1	R
CLO3	Ability to read and understand technical documents in English in the digital field.	ELO6/PI6.4	R
CLO4	Ability to calculate, design and assemble digital electronic circuits. Ability to use methods and procedures to perform practical exercises.	ELO7/PI7.2	R

Notes: I: Introduction, R: Reinforce, M: Mastery

8. Course Content

- Explore logic gate ICs and Flip-Flop. Design and assembly applications for combinational circuits, asynchronous and synchronous binary counters, Johnson counters and ring counters.
- Explore IC CD4017, 74LS164, 47LS194, design and assemble application circuit.
- Explore IC counters 74LS90, 74LS93, CD4040, CD4060, design and assemble digital clock application circuit.
- Explore the up/down BCD counter with preset 74LS192 IC, design and assemble the application circuit.
- Explore encoder, multiplexer, decoder ICs (74LS148, 74LS151, 74LS138, 74LS139), design and assemble application circuits.
- Explore binary adder and binary comparator ICs (74LS283, 74LS85), design and assemble application circuits.
- Explore memory ICs EEPROM 2864, ADC 0809 and DAC 0808, design and assemble circuitry to simulate several application circuits.
- Application of logic gate and IC NE555, design and assembly of oscillator and timing circuits.

9. Teaching Methods

- Presentation
- Practice

10. Student Assessments

- Grading scale: **10**
- Assessment plan:

No.	Content	CLOs	Competency	Assessment Methods	Assessment Tools	Weighting (%)
Assessment						100
1	Test basic knowledge and concepts	CLO1/ PI1.2	R	Quizes	Score sheet (online)	20
2	Circuit design and computer simulation	CLO2/ PI2.1	R	Essay test Simulation post	Rubric	20
3	Practice in calculation, design and assembly of applied digital circuits.	CLO4/ PI7.2	R	Essay test Practice	Short questions	40
4	Exercises and prepare new lessons	CLO3/ PI6.4	R	Essay test	Short questions	20

11. Learning Materials

- Textbook(s):
- [1] Nguyen Dinh Phu, Giao trinh Thuc hanh Ky thuat so, Published by HCMUTE, 2019.
- References:
- [2] Nguyen Huu Phuong, Mach so, Published by Thong ke, 2004.

12. General Information

Academic Integrity

All students in this class are subject to HCMUTE's Academic Integrity Policy (<http://sao.hcmute.edu.vn/>) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. Any violations will be reported to the Faculty of Electrical and Electronic Engineering Dean's office.

Notice of Change

All information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advanced notice. Students need to regularly update the information of their registered class.

Intellectual Property

All contents of these lectures, including written materials distributed to the class, are under copyright protection from HCMUTE's Intellectual Property Regulations. Notes based on these materials may not be sold or commercialized without the express permission of the instructor.

13. Approval Date:

14. Endorsement:

Dean of Faculty	Head of Department	Course Instructor
Assoc. Prof. Minh-Tam Nguyen	Assoc. Prof. Thanh-Hai Nguyen	

15. Revision History:

1 st Revision:	<i>Course Instructor</i> Assoc. Prof. Thanh-Hai Nguyen <i>Head of Department</i>
2 nd Revision:	<i>Course Instructor</i>

	<p>Assoc. Prof. Thanh-Hai Nguyen <i>Head of Department</i></p>
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