



Syllabus

1. **Course name:** Microprocessor

2. **Course code:** MICR330363

3. **Credits:** 3 credits (3:0:8) (3 lecture periods, 0 lab period, 6 self-study periods per week)

4. **Instructors**

a. Chief lecturer: MEng. Nguyen Dinh Phu

b. Co-lecturers:

- MEng. Nguyen Thanh Binh
- MEng. Truong Ngoc Anh
- MEng. Pham Van Hoan
- MEng. Nguyen Van Hiep
- MEng Nguyen Thanh Nghia
- Ph.D. Nguyen Manh Hung

5. **Course Requirements:**

Prerequisite course(s): Digital Systems, Basic Electronics

Previous course(s): Digital Systems

6. **Course Description**

This course equips learners with the functional knowledge of microprocessors and their history. In detail, the course covers the infrastructure and operating principles of an 8-bit microcontroller. Peripheral devices such as timer/counter, analog-to-digital conversion, interrupts, pulse width modulation, UART data transmission are also introduced. Assembly language and C language are used to implement microcontrollers-based applications. The co-design between hardware and software is introduced.

7. **Learning Outcomes (CLOs)**

CLOs	Descriptions	ELO(s) /PI(s)	Compe- tency
	<i>On successful completion of this course students will be able to:</i>		
CLO1	Ability to configure functional registers to meet technical requirements.	ELO1/PI1.2	R
CLO2	Ability to present, report and introduce a microprocessor system.	ELO2/PI2.3	M
CLO3	Ability to read and understand English documents that are relative to microprocessors/microcontrollers.	ELO4/PI4.1	R
CLO4	Ability to design biomedical electronic circuits.	ELO6/PI6.4	I
CLO5	Ability to analyze and evaluate the operation of a microcontroller system according to a given target.	ELO7/PI7.2	I

8. **Content outline**

- Introduction of PIC16F887 microcontroller (features, structure, and functions of ports)
- Introduction of the assembly language on PIC16F887 microcontroller.
- Introduction of the C programming language on PIC16F887 microcontroller.

- Introduction of the I/O ports on PIC16F887.
- Introduction of the timer-counter on PIC16F887.
- Introduction of ADC converter on PIC16F.
- Introduction of internal-external interrupt on PIC16F.
- Introduction of Pulse width modulation on PIC16F887.
- Introduction of UART serial transmission on PIC16F887.

9. Teaching Methods

- *Presentation method*
- *Conversation method*
- *Teamwork method*

10. Assessment(s)

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

No.	Content	CLOs	Competency	Assessment methods	Assessment tools	Weighting %
Formative assessment						50
1.	Circuit design and programming on microcontrollers using peripherals such as led, 7-segment led, button, counter, timer.	CLO3	R	Writing test	Questionnaire	20
2.	Simulating, circuit design, and programming on microcontrollers with peripherals such as LCD, interrupts, ADC, LM35 sensor.	CLO1	R	Check List	Rubric	20
3	Microcontroller architecture, memory, assembly language instructions, C instructions.	CLO5	I	Multichoice	Multichoice Question	10
Summative assessment						50
4.	Analyze and design microcontroller circuits.	CLO4, CLO2	I,M	Writing test	Questionnaire	50

11. Learning Materials:

- Textbook(s):
GVC.ThS. Nguyễn Đình Phú, *Giáo trình Vi xử lý*, NXB Đại học Quốc gia, 2012.
- References:
Programming 8-bit PIC Microcontrollers in C: With Interactive Hardware Simulation, Newnes, 1 edition July 29, 2008.

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.

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Any 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.

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13. Approval Date: <dd/mm/yyyy>

14. Endorsement:

Dean	Head of Department	Chief Lecturer
Assoc. Prof. Dr. Nguyen Minh Tam	Assoc. Prof. Dr. Nguyen Thanh Hai	<Full Name>

15. Revision History:

1st Revision: <dd/mm/yyyy>	Lecturer: Head of Department: Assoc. Prof. Dr. Nguyen Thanh Hai
2nd Revision: <dd/mm/yyyy>	Lecturer: Head of Department: