



### Course description:

The PIC microcontroller: History and features, PIC Architecture & Assembly Language Programming. Branch, Call, and Time Delay Loop. PIC I/O Port Programming. Arithmetic, Logic Instruction, and Programming. Bank Switching, Table processing, Macros, and Modules. PIC18F Hardware connection and ROM loaders. PIC18 Timer programming in Assembly, PIC18 serial port programming in assembly, interrupt programming in assembly, LCD and Keyboard interfacing. ADC, DAC and sensor interfacing.

### Aims of the course:

- Ability to apply knowledge of mathematics, science, and engineering.
- Ability to design and conduct experiments, as well as to analyze and interpret data
- Ability to identify, formulate, and solve engineering problems.
- Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Intended Learning Outcomes (ILOs):

- Understand the fundamentals of microcontroller systems and interface, and have the ability to apply them.
- Ability to write and design a program to perform a specific task by assembly language.
- Apply, Identify, formulate and solve problems by using the concepts of microcontroller systems and interface.
- Have the ability to use simulation tools to design and program a microcontroller
- Develop small microcontroller based applications within teams.

### Course structures:

Week	C. Hrs	ILOs	Topics	Teaching Procedure	Assessment methods
1,2	5	1	History and features, PIC Microcontrollers architecture, Instruction set and Addressing Modes	Power Point	First Exam
3,4	4	2,5	Assembly Language Programming	Handouts	First Exam and Project
4,5	5	2,3,5	Branch, Call and Time Delay Loop	Power Point and	First and

				handouts	Second Exam
6,7	6	1,3,5	Input/ Output Ports , ALU	Handouts	Second Exam and Project
8,9	6	1	Bank Switching, Table Processing, Macros and Modules	Handouts	Final Exam
9,10	5	4,5	Serial Communications, Interrupts	Handouts	Final Exam and Project
10,11	5	4,5	ADC, DAC, LCD, Keypad and Sensor Interfacing	Handouts	Final Exam and Project
12, 13	4	4,5	Projects		
14	2		Review		

### References:

1. PIC Microcontroller & Embedded Systems Using Assembly & C for PIC18 by Muhammad Ali Mazidi and Rolin D. McKinlay, Prentice Hall; 1 edition (February 16, 2007). (textbook)
2. PIC Microcontroller: An Introduction to Software and Hardware Interfacing, Cengage Learning, 1<sup>st</sup> edition (July 1, 2004).

### Assessment Methods:

Methods	Grade	Date
First Exam	20	02/04/2017
Second Exam	20	10/5/2017
Project	10	7-11/05/2017
Final Exam	50	by Department

