

MAR GREGORIOS COLLEGE OF ARTS & SCIENCE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION SCIENCE
ACADEMIC YEAR 2020-2021
ADD- ON COURSE
PIC AND ARM BASED MICROCONTROLLERS

OBJECTIVE OF THE COURSE:

- a) To train the students on the programming of microcontrollers
- b) Interfacing the external peripherals to the microcontroller by understanding the concepts and theory.

Learning Outcomes:

The participants shall learn:

C programming Fundamentals and Embedded C Architecture and other concepts of PIC Microcontrollers

Programming of PIC Microcontrollers ,Architecture of ARM and other concepts of ARM based Microcontrollers , Programming of ARM based Microcontrollers

Syllabus

UNIT I Microprocessors and Microcontrollers, Applications of Microcontrollers in real world, Concepts of C programming: Identifiers, Keywords, Constants, Conditional Statements, Arrays, Functions, Pointers Dynamic Memory allocation and Storage Classes, Traditional C versus Embedded C Programming.

UNIT II Introduction to PIC based Microcontrollers, PIC16F887/877A Architecture, Pinout diagram, Port and Registers and Memory Organization. Introduction MPLAB and Proteus Software tools, Programming: LED, 7 Segment Display and LCD (including concepts)

UNIT III Concepts and Programming for UART, TIMERS, Analog to Digital Converter, Pulse Width Modulation and Serial Peripheral Communication Interface of PIC16F887/877A.

UNIT IV Introduction to ARM based Microcontrollers, ARM Architecture, ARM 7LPC2148 Pin-out Diagram and Configuration. Configuring Registers for Programming, ARM Register set, Memory Organization, Pipelining; Instruction set format, Introduction to Keil IDE, Programming: LED and 7-segment Display.

UNIT V ARM Thumb Instruction set, ARM Processor family, ARM development tools and Programmers Model, ARM Coprocessor, Interrupts, LPC2148 Timers and SPI. Programming: LCD and ADC/DAC (including concepts).