

**Coordinators**
[PREETHAM JINUGA](#)

Freelancer

[Download Syllabus in PDF format](#)
Syllabus**References****COURSE OUTLINE**

- The goal of the course is to teach the concepts C Language and object oriented programming, PIC architecture and peripheral interfacing.
- To read and understand the C and C++ programming, PIC microcontroller architecture and programming
- The course focuses on how to write program and peripheral interfacing of PIC microcontroller and develop the applications.

Learning outcomes:

- Understand the fundamentals of embedded systems
- Understand the differences of microprocessor and controller
- Understanding of C and basics of C
- Understand the OOP concepts
- Understand the concepts of classes, objects, methods, constructors, destructors in C++
- Understand the microcontroller architecture (PIC)
- Understand and able to write the assemble language program.
- Understand and able to write the I/O and timers/counter programming

COURSE DETAIL

Unit No	Title
1	Embedded system introduction Introduction to embedded system, embedded system architecture, classifications of embedded systems, challenges and design issues in embedded systems, fundamentals of embedded processor and microcontrollers, CISC vs. RISC, fundamentals of Vonneuman/Harvard architectures, types of microcontrollers, selection of microcontrollers.
2	Concepts of C programming C concepts and programming- data types, advanced data types- register, constants, IO operations, operators, operator precedence and associatively, Conditional statements & loops, arrays, single and double dimensional arrays, stings and string operations. Functions: Parameter passing-Pass by Value, Pass by Reference; creating modular programs using functions, Recursive functions. Structures & Unions: declaration, accessing members of structure, difference between structure and union, User Defined Data Types, Enumerated data type. Pointers: pointer basics and concepts, arrays and pointer relation, passing pointers to functions, dynamic memory allocation. Files and file operations. Linked lists, stacks and queues. Pre-processor directives, command line arguments.
3	Object oriented programming Differences between C and C++, Fundamentals of object oriented programming; OOP vs. Procedure oriented programming, OOP concepts: classes, objects, abstraction, polymorphism, inheritance, data binding and encapsulation. Basics of C++: features of C++, data types, standard I/O, arrays and strings in C++. Classes in C++, instantiation, creating objects and object scope, data abstraction, data encapsulation, constructors and destructors, methods and access modifiers, function and operator overloading Inheritance-Base and Derived classes, Inheritance types, Scope Resolution operator; polymorphism and virtual functions, exception handling
4	PIC Architecture Introduction to PIC microcontrollers, PIC architecture, comparison of PIC with other CISC and RISC based systems and microprocessors, memory mapping, assembly language programming, addressing modes, instruction set.

5 I/O Programming

PIC I/O ports, I/O bit manipulation programming, timers/counters, programming to generate delay and wave form generation, I/O programming, LEDs, 7segment led's, LCD and Keypad interfacing.

Important: Please enable javascript in your browser and download [Adobe Flash player](#) to view this site
Site Maintained by Web Studio, IIT Madras. Contact Webmaster: nptel@iitm.ac.in