SUBJECT:	**EC-204 – DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING**
CREDIT HOURS:	**2-1**
CONTACT HOURS:	5 Hours per Week
INSTRUCTOR:	
TEXT BOOKS:	***Object oriented programming in C++ (4th Ed)*** by Robert LaFore
REFERENCE BOOKS:	***C++ How to program (5th Ed)*** by Deitel and Deitel
PREREQUISITE:	CS 114 – Fundamentals of Programming
MODE OF TEACHING:	Lectures, Practical and Demonstrations

COURSE DESCRIPTION: This is an advanced course in Mechatronics engineering. The course has two portions: teaching the concept and application of data structures in c++ language and teaching the concept and application of object oriented programming in general while concentrating on c++. The course will teach the students to develop efficient software using object oriented approach, templates and data structures.

COURSE OBJECTIVES: To impart a working knowledge of object oriented programming and data structures in c++ so that the students are able to use these tools for efficient and effective software development.

LEARNING OUTCOMES:

Upon successful completion of the course, the student will demonstrate competency by being able to:

1. Be fluent in the use of recursion.
2. Be fluent in the use of object-oriented programming concepts (e.g. classes, objects, inheritance, polymorphism and overloading).
3. Be able to design and implement nontrivial c++ programs (roughly 1000 lines of code), from an English language specification.
4. Understand basic data structures including lists, stacks, queues and trees.

PRACTICAL APPLICATION: Object oriented programming and data structures are the fundamental concepts required for effective software development on all platforms including android and iOS app development and programming embedded systems.

TOPICS COVERED:

S.No	Topic	Week/Lecture
1	Objects and Classes	1
2	Self-Referential Structures	2-3
3	Linked Lists	4-5
4	Stacks and Queues	6-7
5	Trees	8-9
6	Sorting Algorithms	10
7	Operator Overloading	11-12
8	Inheritance	13
9	Polymorphism	14
10	Templates	15-16

COURSE TARGETS:

S.No	Outcomes	Level of Learning	PLO
1	Developing simple code based on recursion.	C3	1
2	Application of OOP concepts to develop programs	C3	1
3	Implement basic data structures including lists, stacks, queues and trees.	C3	2
4	Analysis of user defined classes and templates	C4	2
5	Be able to design and implement nontrivial C++ programs (roughly 1000 lines of code), from an English language specification.	C5	3