EEX3417 Software Development for Engineers

Level	3
Course Code	EEX3417
Course Title	Software Development for Engineers
Credit value	4
Core/Optional	Core
Course Aim/s	Apply fundamental concepts of Programming to develop a software application to solve a problem.
Course Learning Outcomes (CLO):	After completion of this course student will be able to: CLO1: Demonstrate the ability to gather requirements to develop a software solution CLO2: Describe an algorithmic solution to a problem using pseudocode and flowcharts. CLO3: Design a solution to a problem using structured design principles and object oriented design principles. CLO4: Applies fundamental concepts of Programming to write, test, debug and deploy computer Programmes. CLO5: Uses Database Management Systems to represent data related to a problem. CLO6: Describe security threats for software and the basic techniques to make software secure. CLO7: Use Numerical Computing Software for engineering problem solving.

Content	**Outline Syllabus:**
	
	 Unit 1
	    Session 1: Different Components of Software Systems
	    Session 2: Evolution of Programme Paradigms
	    Session 3: Introduction to Software Engineering
	    Session 4: Software Requirement Elicitation
	    Session 5: Software Requirement Analysis
	    Session 6: Structured Programming
	    Session 7: Function Oriented Design
	 Unit 2
	    Session 8: Algorithms
	    Session 9: Programming with C language
	    Session 10: Data Types and Variables in C
	    Session 11: C Operators and Expressions
	    Session 12: Control Structures in C
	    Session 13: Basic input output
	    Session 14: Functions in C
	    Session 15: Data Structures
	    Session 16: Dynamic data structures
	 Unit 3
	    Session 17: Introduction to Simulation Software
	    Session 18: Applying Simulation Software
	    Session 19: Object Oriented Design Principles
	    Session 20: Introduction to data modelling and database management
	    Session 21: Data modelling with Entity-Relationship diagrams
	    Session 22: Normalization
	    Session 23: Graphical User Interfaces Design
	    Session 24: Bridging application software and database management systems
	    Session 25: Software Testing Methodologies
	    Session 26: Software Deployment

Session 27: Software Security

Laboratory Work:

1. Design an algorithm using a flow chart for a given problem, write the solution using C Programming language following coding standards, execute and debug the Programme.
2. Design and implement a database using a Database Management System and build a small application with a graphical user interface.
3. Solve a problem using simulation software.

Mini Project:

Find a client, gather requirements, analyse requirements, design, implement and test the solution for a simple problem in the specified problem domain.