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.