Bachelor of Engineering (Computer Science & Engineering)

**Course Code:** CS107 **Course Name:** Object Oriented Software Engineering

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| **Topics** |
| Introduction to Software Engineering: The Evolving Role of Software, Changing nature of software |
| The Software Process: Software Engineering– Layered Technology, Process Models: The Waterfall Model |
| Evolutionary Process Models: Incremental Models, Spiral Model |
| An Agile View of Process: what is agility, what is an agile process, Agile Process Models: extreme programming (XP), ASD, Scrum |
| Introduction to UML and modelling software |
| Requirements Engineering: Requirements Engineering Tasks: Initiating Requirement, Engineering Process, Eliciting Requirements |
| Introduction to Use-case Diagram |
| Building Analysis Model: Requirement Analysis, Data modelling Concepts, Flow Oriented Modelling |
| Design Engineering: Design concepts and model, Data design, Architectural design, designing class-based components, User interface analysis and design, Interface analysis and Interface design steps |
| Introduction to Class diagram |
| Software Testing Strategies and Tactics: A strategic approach for Software Testing, Software Testing Strategies: Unit Testing |
| Integration Testing, Validation Testing, System Testing, Test strategies for Object Oriented Software- Unit Testing in the OO Context, Integration Testing in the OO Context |
| White-Box Testing Techniques: Basis Path Testing, Control Structure Testing: condition and loop testing |
| Black-Box Testing Techniques: Equivalence Partitioning and Boundary Value Analysis |
| Testing Object Oriented Applications: Testing OOA and OOD model, Object Oriented Testing Strategies, Object Oriented Testing Methods |
| Introduction to Interaction diagrams |
| Project Management & Metrics: The management spectrum, Metrics for process & project, Metrics for Software Quality, Estimation |
| Product Metrics: Metrics for the requirement model, Metrics for the design model, Metrics for testing. |
| Introduction to Activity diagram |
| Software Project Planning: Objective, Software Scope and Resources, Software Project Estimation and Decomposition Techniques (LOC, FP) |
| Empirical Estimation Models: COCOMO Model, Estimation of Object-Oriented Projects |
| Project Scheduling: Basic concepts of scheduling, Project Scheduling, Earned Value Analysis |
| Risk Management: Software Risks & Risk |
| Strategies, Risk Identification, Risk Projection, Risk Mitigation, Monitoring and Management (RMMM) plan |
| Overview of Quality Management and Change Management |

# Reference Books:

R1: Software Engineering, A practitioner’s Approach by Roger S. Pressman.

R2: Software Engineering by Ian Sommerville, Sixth Edition, Adison-Wesley Pub. Co.

R3: An Integrated Approach to Software Engineering by Pankaj Jalote, Third Edition.

R4: Fundamentals of Software Engineering by Rajib Mall, 5th Edition, PHI Learning