

NIRMA UNIVERSITY
Institute of Technology
B.Tech. Computer Science and Engineering
Semester – V

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Course Code	2CS504
Course Title	Software Engineering

Course Outcomes:

At the end of the course, students will be able to –

1. explain various phases of software development lifecycle
2. analyse and document the requirement specifications for a software project
3. develop the process model using standard tools and methodologies
4. implement a quality software project through effective team-building, planning, scheduling and risk assessment.

Syllabus

Teaching Hours: 45

Unit I

Introduction: Introduction to Software Engineering, Defining Software, Changing Nature of Software, attributes of a good Software, Software Product, Software Development Life Cycle, Software Processes, Software Engineering Practices, Software Myths

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Unit II

Software Process Models: Generic Process Model (Defining Framework Activity, Identifying Task Set), Process Assessment & Improvement, Waterfall Process Model, Incremental Process Model, Spiral Process Model, Prototyping Software Process Model, Evolutionary Process Model, Component Based Process Model, Introduction to basic concepts of Agile Software Development

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Unit III

Project Management Concepts: Management activities, Project Planning, Project Scheduling, Risk analysis and Management, Reactive vs. Proactive Risk Strategies , Software Risks, Risk Identification, Risk Projection, Risk Refinement Risk Mitigation, Monitoring and Management.

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Unit IV

Software requirement engineering: Software Requirements, Requirement Engineering, Extraction and Specification, Feasibility Study, Requirements Modelling, Object Oriented Analysis.

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Unit V

Design Concepts: Object oriented design, Architectural Design, Component level Design, User Interface Design, Distributed Systems Architecture, Real Time Software Design, User Interface Design, Pattern Based Design

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Coding: Top-down and bottom-up, structured programming, information hiding, programming style, and internal documentation.



Unit VI

Software Process & Metrics: Metrics in the Process and Project Domains: Process metrics, project metrics, Software Measurement Metrics for Software Quality 6

Unit VII

Software Testing: Unit testing, integration testing, black box and white box testing, regression testing, performance testing, object-oriented testing. 8

Verification and validation of Software: Software Inspections and Audit, Automated Analysis, Critical systems validation Software Quality Assurance, Quality Standards, Quality Planning and Control, Various Quality models.

Software configuration management: Software Configuration Items · SCM repository, SCM process, Version Control, Change Management

Self-Study:

Aspect Oriented Software Development, Unified Process Model, Computer Aided Software Engineering & its Tools, Software Maintenance & Reengineering

Laboratory Work:

Laboratory work will be based on the above syllabus with minimum 10 experiments to be incorporated.

Suggested Readings[^]:

1. Ian Sommerville, Software Engineering, Addison – Wesley
2. Roger Pressman, Software Engineering A Practitioner's Approach, McGraw Hill Publication
3. Rajib Mall, Fundamentals of Software Engineering, Prentice Hall of India
4. Ivar Jacobson, Object Oriented Software Engineering A use case Approach, Pearson

L=Lecture, T=Tutorial, P=Practical, C=Credit

[^]this is not an exhaustive list