NIRMA UNIVERSITY
SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY
M.Tech. in Electronics and Communication Engineering (Embedded System)
M.Tech. Semester - II
Department Elective II

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Course Code	6EC268
Course Title	Software Engineering

Course Learning Outcomes (CLOs):

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

1. Propose the use of software models and understand the software engineering process in terms of requirements, design, and implementation for given applications.
2. Apply software engineering process to an embedded software project.
3. Produce software design based on requirements and conduct verification, validation and documentation.

Syllabus: **Teaching Hours:45**

UNIT I: Introduction **10**

Software products, software process, Software models - Waterfall Model, Incremental Model, Evolutionary Model, and Boehm's spiral model, Process visibility, professional responsibility, computer based system engineering. Requirements and Specification - analysis, system model, software prototyping, formal specification, algebraic specification and model based specification.

UNIT II: Project Management **10**

Introduction to Project Management; Project Planning, Project Scheduling and Tracking, Software Metrics and measurement, Risk Management: S/W Risk, Risk Identification, Risk Projection, RMM, Configuration Management - Introduction to Configuration management, versioning of software, Change Control, Software release, SCM standards, and SCM Audit.

UNIT III: Design Concept and Methods **07**

Design process, Architectural design, Object Oriented design, function-oriented design, real-time system design and user interface design. Software Quality Assurance, Quality Models, SQA, S/W Reviews, statistical Quality Assurance

UNIT IV: Change Request Management **05**

Requirements of software changes, change request management lifecycle, change request form, change request analysis and implementation.

UNIT V: Verification and Validation **05**

Unit Testing, Component Testing, Integration Testing, System Testing, alpha and beta testing, Verification and Validation.

UNIT VI: CASE Tool **05**

Computer Aided software engineering, CASE workbenches, integrated CASE environments, Introduction to Rational Unified process and Rational Tools

UNIT VII: Maintenance and Evolution **03**

Client/Server software engineering, software maintenance, configuration management, software re-engineering, software reverse-engineering. Maturity Models of Software Industry - CMM, 6sigma, PCMM, and ISO 9001

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Suggested Readings:

1. Roger S. Pressman, Software Engineering, McGraw-Hill International
2. Ian Sommerville, Software Engineering, Addison Wesley