

Software Engineering

UNITS	COURSE CONTENT	CONTACT HOURS
1	Software Product, Process and Models: Introduction to software engineering, software characteristics and crises, software process models (Waterfall, Prototyping, Spiral, RAD, Agile), process improvement, CMM and metrics	5L
2	Requirements Engineering and Analysis: Functional/non-functional requirements, sources and elicitation techniques, modeling (DFDs, ERD, Use Case), SRS document, IEEE standards, requirements validation and traceability	7L
3	Software Design Principles and UML: Design process, principles, modularization, architecture (styles/views), user interface design, SA/SD methodology, UML diagrams (class, sequence, activity), design metrics	7L
4	Software Testing and Analysis: Static and dynamic analysis, inspection, testing fundamentals, levels (unit, integration, system, acceptance), test criteria, test case design, black-box/white-box, regression, testing frameworks and tools	6L
5	Software Maintenance and Project Management: Maintenance types, configuration/change management, version control, program comprehension, re-engineering, estimation (COCOMO), scheduling, quality assurance, risk management, CASE tools	7L
6	Quality Assurance and Advanced Topics: SQA frameworks, ISO and SEI-CMM models, verification/validation methods, project metrics, introduction to software security, ethical/legal aspects	5L
7	Capstone and Application: Preparation of project plans, documentation standards, real-world case studies, team-based project work or mini-project applying end-to-end software engineering process	3L