

SOFTWARE ENGINEERING SYLLABUS

Module 1: Overview of Software Engineering

- Nature of Software and Software Engineering
- Software Process, Project, and Product
- Process Models: Classical and Evolutionary
- Introduction to Agility: Agile Process, Extreme Programming (XP)
- Principles of Agile Software Development
- Overview of System Engineering

Module 2: Introduction to Software Project Management

- Project Planning: Scope, Work Breakdown Structure, Milestones, Deliverables
- Cost and Estimates: Human Resources, Time-Scale, Costs
- Risk Management and RMMM Plan
- CASE Tools, Agile Project Management
- Managing Team Dynamics and Communication
- Metrics and Measurement

Module 3: Modelling Requirements

- Software Requirements and Types
- Requirements Engineering Process
- Requirement Elicitation, System Modeling
- Requirements Specification and Validation
- Requirements Elicitation Techniques
- Requirements Management in Agile

Module 4: Software Design

- Design Concepts and Principles: Abstraction, Refinement, Modularity
- Cohesion and Coupling
- Architectural Design and Detailed Design
- Transaction and Transformation
- Refactoring of Designs, Object-Oriented Design
- User Interface Design

Module 5: Validation and Verification

- Strategic Approach to Software Testing
- Testing Fundamentals: Test Plan, Design, Execution
- Reviews, Inspections, and Auditing
- Regression Testing, Mutation Testing
- Object-Oriented Testing, Web-Based System Testing
- Mobile App Testing and Automation Tools
- DevOps Testing, Cloud, and Big Data Testing

Module 6: Software Evolution

- Software Maintenance and Types
- Software Configuration Management (SCM): Overview and Tools
- Re-Engineering and Reverse Engineering
- Software Reuse

Module 7: Quality Assurance

- Product and Process Metrics
- Quality Standards and Models: ISO, TQM, Six Sigma
- Process Improvement Models: CMM and CMMI
- Quality Control and Quality Assurance
- Quality Management: Factors and Methods