| Course code | Software Engineering | L | T | P | J | C |
|---|---|---|---|---|---|---|
| SWE1701 | | 3 | 0 | 0 | 0 | 3 |
| Pre-requisite | None | Syllabus version | | | | |
| | | v.1.0 | | | | |

**Course Objectives:**

- To introduce the fundamental concepts of Software Engineering
- To analyse different metrics for efficient software project management.
- To explain different methods and models for system design

**Expected Course Outcome:**

- Understand the best practices and standards and their applications.
- Analyze a problem, identify and define the user and system requirements.
- Design a software system and its process to meet user needs
- Evaluate and select and software systems considering user needs.
- Evaluate processes and products against the applicable standards and metrics
- Assist in the creation of an effective project plan.
- Analyze software risks and identify mitigation strategies.

| Student Learning Outcomes (SLO): | 2, 5, 11 |
|---|---|

| Module:1 | An Overview of Software Engineering: | 6 hours | SLO: 2,11 |
|---|---|---|---|

Nature of Software, Software Engineering, Software Process, Software Engineering Practice, Software Process Models: Linear, RAD, Incremental, Spiral Component-based development, Fourth Gen Techniques.

| Module:2 | Modeling (Requirements) | 6 hours | SLO: 2 |
|---|---|---|---|

Requirements Engineering, Establishing the Groundwork, Eliciting Requirements, Developing Use Cases, Building the Requirements Model, Negotiating Requirements, Validating Requirements.

| Module:3 | Modeling (Design) | 5 hours | SLO: 5 |
|---|---|---|---|

Design within the context of Software Engineering, Design Process, Design Concepts, Design Model-Software Architecture.

| Module:4 | Software Testing | 6 hours | SLO: 2,11 |
|---|---|---|---|

Strategic Approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Software Testing Fundamentals, Black box Testing, White box testing.

| Module:5 | Process and Product Metrics | 6 hours | SLO: 5 |
|---|---|---|---|

Product Metrics, Metrics for the Requirements Model, Metrics for the Design Model - Architectural Design Metrics, Object-Oriented Design, Software Measurement, Metrics for Software Quality.

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|---|---|---|---|
| **Module:6** | **Managing Software Projects** | **6 hours** | **SLO: 2** |
| People, Product, Project, Process, Software Project Estimation, Decomposition Technique, Empirical Estimation Models, Project Scheduling. | | | |
| **Module:7** | **Risk Management and Software Maintenance** | **8 hours** | **SLO: 2** |
| Software Risks, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation, Monitoring and Management, RMMM Plan, Software Maintenance, Software Supportability, Re-engineering. | | | |
| **Module:8** | **Contemporary issues:** Emerging Trends in Software Engineering Technology Evolution, Software Engineering Trends, Technology Directions, Tools, Case Studies. | **2 hours** | **-** |
| | **Total Lecture hours:** | **45 hours** | |

**Text Book(s)**

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|---|---|
| 1. | Roger Pressman, Software Engineering: A Practitioner's Approach, 7th Edition, McGraw-Hill, 2010. |

**Reference Books**

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|---|---|
| 1. | Ian Sommerville, Software Engineering, 9th Edition, Addison-Wesley, 2010 |
| 2. | Pankaj Jalote, A Concise Introduction to Software Engineering, Springer,2008 |
| 3. | William E. Lewis , "Software Testing and Continuous Quality Improvement", Third Edition, Auerbach Publications, 2008 |

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| Recommended by Board of Studies | 12-8-2017 | | |
| Approved by Academic Council | No. 47 | Date | 5-10-2017 |