

Software Engineering

BCSE-301L

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- Syllabus
- Text Books
- Course Objectives
- Course Outcomes
- Evaluation Plan (Rubrics for Assignments/Quiz)

Syllabus: Module 1 – Overview Of Software Engineering (6 Hours)

- ❑ Nature of Software**
- ❑ Software Engineering**
- ❑ Software Process, Project, Product**
- ❑ Process Models**
- ❑ Classical Evolutionary Models**
- ❑ Introduction to Agility**
- ❑ Agile Process**
- ❑ Extreme programming**
- ❑ XP Process**
- ❑ Principles of Agile Software Development framework**
- ❑ Overview of System Engineering**

Syllabus: Module 2 - Introduction To Software Project Management (6 Hours)

☐ Planning

☐ Scope

☐ Work break-down structure

☐ Milestones

☐ Deliverables

☐ Cost and Estimates

☐ Human Resources

☐ Time-scale

☐ Costs

☐ Risk Management

☐ RMMM Plan

☐ CASE TOOLS

☐ Agile Project Management

☐ Managing team dynamics and communication

☐ Metrics and Measurement

Syllabus: Module 3 – Modeling Requirements (8 Hours)

- ❑ Software Requirements and its types**
- ❑ Requirements Engineering process**
- ❑ Requirement Elicitation**
- ❑ System Modeling – Requirements Specification and Requirement Validation**
- ❑ Requirements Elicitation techniques**
- ❑ Requirements management in Agile**

Syllabus: Module 4 – Software Design (8 Hours)

☐ Design Concepts and Principles

☐ Abstraction

☐ Refinement

☐ Modularity Cohesion coupling,

☐ Architectural design

☐ Detailed Design Transaction Transformation,

☐ Refactoring of Designs

☐ Object oriented Design User-Interface Design

Syllabus: Module 5 – Validation and Verification (7 Hours)

- ❑ Strategic Approach to Software Testing**
- ❑ Testing Fundamentals**
- ❑ Test Plan**
- ❑ Test Design**
- ❑ Test Execution**
- ❑ Reviews**
- ❑ Inspection and Auditing**
- ❑ Regression Testing**
- ❑ Mutation Testing**
- ❑ Object oriented testing**
- ❑ Testing Web based System**
- ❑ Mobile App testing**
- ❑ Mobile test**
- ❑ Automation and tools**
- ❑ DevOps Testing**
- ❑ Cloud and Big Data Testing**

Syllabus: Module 6 – Software Evolution (4 Hours)

- ❑ Software Maintenance**
- ❑ Types of Maintenance**
- ❑ Software Configuration Management**
- ❑ Overview – SCM Tools**
- ❑ Re-Engineering**
- ❑ Reverse Engineering**
- ❑ Software Reuse**

Syllabus: Module 7 – Quality Assurance (4 Hours)

- ☐ Product and Process Metrics**
- ☐ Quality Standards Models: ISO, TQM, Six-Sigma**
- ☐ Process improvement Models: CMM & CMMI**
- ☐ Quality Control and Quality Assurance**
- ☐ Quality Management**
- ☐ Quality Factors**
- ☐ Methods of Quality Management**

Syllabus: Module 8 – Contemporary Issues (2 Hours)

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Text Books/ Reference Books:

☐ Text Books:

1. Ian Somerville, Software Engineering, 10th Edition, Addison-Wesley, 2015

☐ Reference Books:

1. Roger S. Pressman and Bruce R. Maxim, Software Engineering: A Practitioner's Approach, 10th edition, McGraw Hill Education, 2019.
2. William E. Lewis , Software Testing and Continuous Quality Improvement, Third Edition, Auerbach Publications, 2017

Course Objectives

1. To introduce the essential Software Engineering concepts.
2. To impart concepts and skills for performing analysis, design ,develop, test and evolve efficient software systems of various disciplines and applications
3. To make familiar about engineering practices, standards and metrics for developing software components and product.

Course Outcomes

1. Apply and assess the principles of various process models for the software development.
2. Demonstrate various software project management activities that include planning , Estimations, Risk assessment and Configuration Management.
3. Perform Requirements modelling and apply appropriate design and testing heuristics to produce quality software systems.
4. Demonstrate the complete Software life cycle activities from requirements analysis to maintenance using the modern tools and techniques.
5. Escalate the use of various standards and metrics in evaluating the process and product.

Evaluation Plan (Rubrics for Assignments/Quiz/Term-Project)

S.No.	Component	Modules	CO	Timeline	Date	Marks
1	DA-1	1, 2, 3	1,2,3	Before CAT 1	07-02-2024	10
2	DA-2	4, 5	4	Between CAT-1 and CAT 2	27-03-2024	10
3	Quiz	6, 7	5	After CAT 2	23-04-2024	10

Note for Students

□ This power point presentation is for lecture, therefore it is suggested that also utilize the text books and lecture notes.