

COURSE CODE	COURSE TITLE	L	T	P	C
UCS1405	SOFTWARE ENGINEERING	3	0	0	3

OBJECTIVES

- To understand the phases in a software project
- To understand fundamental concepts of requirements engineering and Analysis Modeling.
- To understand the various software design methodologies
- To learn various testing techniques and maintenance measures.

UNIT I SOFTWARE PROCESS MODELS 9

Introduction to software engineering; Principles and practices; Software Process: Generic process model -- Perspective and specialized process models -- Secure development lifecycle; Introduction to Agility: Agile process model.

UNIT II PROJECT PLANNING AND MANAGEMENT 9

Project planning process; Software Project Estimation: Decomposition techniques -- Empirical estimation models -- The make/buy decision -- Project scheduling; Risk Management: Risk identification -- Risk projection -- Risk mitigation.

UNIT III REQUIREMENTS ANALYSIS AND SPECIFICATION 9

Software Requirements: Functional and non-functional -- User requirements -- System requirements -- Software requirements document; Requirement Engineering Process: Feasibility studies -- Requirements elicitation and analysis -- Requirements validation -- Requirements Management; Classical Analysis: ~~Structured system analysis; Petri Nets.~~

UNIT IV SOFTWARE DESIGN 9

Design Concepts: Design process -- Design concepts -- Design model -- Modeling principles; Architectural Design: Architectural Styles -- Architectural Mapping using Dataflow; User Interface Design: The Golden rules -- Interface Analysis -- Interface Design; Design for security; Component Level Design: Designing Class based Components -- Traditional Components.

UNIT V TESTING AND MAINTENANCE 9

Software Testing Fundamentals; Internal and External Views of Testing: White Box Testing -- Basis Path Testing -- Control Structure Testing-- Black Box Testing -- Unit Testing -- Integration Testing -- Regression Testing -- Validation Testing -- System Testing -- Security Testing; Debugging; Software Implementation: Coding Practices and Principles; Maintenance: Types -- Reengineering -- Reverse Engineering -- Restructuring.

TOTAL PERIODS: 45

OUTCOMES

On successful completion of this course, the student will be able to:

- Understand principles of software engineering and choose an appropriate process model (K4)

- Manage project schedule, estimate project cost and effort required (K3)
- Perform requirements analysis and modeling (K3)
- Apply systematic procedure for software design (K3)
- Compare and contrast the various testing and maintenance activities (K2).

TEXTBOOKS

1. Roger S Pressman, “Software Engineering – A Practitioner ’s Approach”, McGraw-Hill International Edition, Seventh Edition, 2010.
2. Ian Sommerville, “Software Engineering”, Pearson Education Asia, Ninth Edition, 2011.

REFERENCE BOOKS

1. Rajib Mall, “Fundamentals of Software Engineering”, PHI Learning Private Limited, Third Edition, 2009.
2. Pankaj Jalote, “Software Engineering, A Precise Approach”, Wiley India, 2010.
3. Kelkar S A, “Software Engineering”, Prentice Hall of India, 2007.
4. Stephen R Schach, “Software Engineering”, Tata McGraw-Hill Publishing Company Limited, 2007.