

SHORT SYLLABUS

BCSE301L Software Engineering (3-0-0-3)

Software Engineering – Process Models – Introduction to Agility – Project Management – Cost and Estimates – CASE Tools – Requirements Engineering Process – Design Concepts and Principles – Validation and Verification – Software Evolution and Maintenance – Software Quality Assurance – Process Improvement Models.

BCSE301L	Software Engineering		L	T	P	C
			3	0	0	3
Pre-requisite	NIL	Syllabus version				
		1.0				
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 products.						
Course Outcomes						
On completion of this course, student should be able to: 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.						
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						
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						
Module:3			Modelling 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.						
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						
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						
Module:6			Software Evolution			4 hours

Software Maintenance, Types of Maintenance, - Software Configuration Management – Overview – SCM Tools. Re-Engineering, Reverse Engineering, Software Reuse			
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			
Module:8	Contemporary Issues		2 hours
	Total Lecture hours:		45 hours
Text Book(s)			
1.	Ian Somerville, Software Engineering, 10 th Edition, Addison-Wesley, 2015		
Reference Books			
1.	Roger S. Pressman and Bruce R. Maxim, Software Engineering: A Practitioner's Approach, 10 th edition, McGraw Hill Education, 2019		
2.	William E. Lewis , Software Testing and Continuous Quality Improvement, Third Edition, Auerbach Publications, 2017		
Mode of Evaluation: CAT, Written assignment, Quiz, FAT.			
Recommended by Board of Studies		04-03-2022	
Approved by Academic Council		No. 65	Date 17-03-2022