SARDAR VALLABHBHAI PATEL EDUCATION SOCIETY'S

R. N. G. PATEL INSTITUTE OF TECHNOLOGY - RNGPIT

An Autonomous Institute u/s UGC Act 1956

Approved by AICTE & affiliated to Gujarat Technological University

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Program Name: Integrated M.Sc. (IT)

Level: Post Graduate

Branch: Information Technology

Subject Code: 1BS405

Subject Name: Software Engineering

w. e. f. Academic Year:	2025
Semester:	4
Category of the Course:	Major Course

Prerequisite:	NIL
Rationale:	This course introduces students to the basic methods and processes used to plan, design, develop, test software in a simple and practical way.

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			C Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				SEE (TH)	IAT	CCE	SEE (P)	
3	0	0	3	70	30	0	0	100

Where SEE: Semester End Examination, IAT: Internal Assessment Test, CCE: Continuous and Comprehensive Evaluation

Course Content:

Unit No.	Content	No. of Hours	% of Weightage	Corresponding CO(s)
	Section A			
1.	**Introduction to Software Engineering** 1.1 Definition of Software & Software Engineering 1.2 Software characteristics & components 1.3 Software engineering myths 1.4 Software development life cycle 1.5 Role & responsibilities of a Software Engineer	3	10%	CO1

2.	**Software Process Models**
	2.1 Software process models
	    2.1.1 Waterfall Model
	    2.1.2 Incremental Model
	    2.1.3 Spiral Model
	    2.1.4 V-Model
	    2.1.5 Prototyping Model
	    2.1.6 Agile Model
	2.2 Comparison of Process Models
		6	20%	CO2

3.	**Requirements Engineering**
	3.1 Need for requirements engineering
	3.2 Types of requirements
	    3.2.1 Functional & Non-functional
	    3.2.2 User, System, Business requirements
	3.3 Requirements Elicitation
	3.4 Requirements analysis
	3.5 Feasibility study
	    3.5.1 Software Requirement Specification
		6	20%	CO3

	Section B			
4.	**Software Design Concepts** 4.1 Design principles 4.2 Architectural design 4.3 Data Flow Diagrams 4.4 ER Diagrams 4.5 UML diagrams:6 Use Case, Class, Sequence, Activity	6	20%	CO4

5.	**Software Testing** 5.1 Need for testing and quality assurance 5.2 Types of testing 5.3 Software testing life cycle 5.4 Test case design 5.5 Introduction to automated testing	3	10%	CO5
6	**Software Project Management** 6.1 Software project planning 6.2 Cost estimation techniques 6.3 Scheduling 6.4 Risk management 6.5 Software quality management	6	20%	CO6
	Total	30	100	

Course Outcome:

After Completion of the Course, the Student will able to:

No	Course Outcomes	Bloom's Taxonomy Alignment
01	Understanding the basic concept of Software Engineering.	U
02	Explain different software development models in simple terms.	U
03	Identify basic software requirements through elicitation.	U
04	Apply software design principles to develop DFD and UML based design models.	A
05	Understanding software testing.	U
06	Able to plan, estimate, schedule, and manage software projects.	U

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks(%)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
40	40	20	-	-	-

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:
1. Software Engineering- A practitioner's Approach – Roger S.Pressman - 9th Edition
2. Fundamentals of software Engineering, Prentice Hall of India – Rajib Mall - 5th Edition
3. Software Engineering – K. K. Aggarwal & Yogesh Singh - 4th Edition
4. A Practical Approach to Software Engineering – Somdutta & De
5. Software Testing: Principles and Practices – Srinivasan Desikan & Gopalaswamy Ramesh - 1st Edition

(b) Open source software and website:
1. www.nptel.ac.in
2. www.medium.com
3. www.coursera.org

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