GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc.), 2nd Semester
Branch: Information Technology
Subject Name: Software Engineering
Subject Code: 1120502

With effective from academic year 2022-23

Type of course: Core
Prerequisite: Object Oriented Programming fundamental
Rationale: This subject is known as pioneer of Software Development Life Cycle, Development models and Agile Software development. It covers fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods. It also covers various software testing issues and solutions in software unit test; integration, regression, and system testing with quality assurance.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory		Practical		
L	T	P	C	University exams (ESE)	Internal evaluation (PA)	External Practical /viva Exam(ESE)	Internal Practical /viva Exam(PA)	
3	-	-	3	50	-	-	-	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit;
ESE- End Semester Examination; PA- Progressive Assessment

Contents:

Sr. No.	Practical / Hands on Exercise	Hrs.	Weightage
1	**UNIT–I** **SOFTWARE** : Software Characteristics, Components & Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & RAD Model., Evolutionary Software Process Model – Incremental Model and Spiral Model. **SOFTWARE PROJECT MANAGEMENT**: Project Management Concepts – People Problem and Process Software process and Project Metrics: Metrics in The Process and Project Domains. Software Measurement –Size Oriented, Function Oriented Metrics, Extended Function	10	20
2	**UNIT–II** **SOFTWARE PROJECT PLANNING**: Objectives, Scope, Project Estimation, Decomposition Techniques, Empirical Estimation Models. **ANALYSIS CONCEPT AND PRINCIPLES**: Requirement Analysis, Communication Techniques, Analysis Principles, Software Prototyping, Specifications. **ANALYSIS MODELING**: Elements of The Analysis Modeling, Data Modeling. Functional Modeling and Information Flow, Behavioral Modeling, Data Dictionary.	10	20
3	**UNIT–III** **DESIGN CONCEPTS AND PRINCIPLES**: Design Process, Design Concepts, Design Principles, Effective Modular Design. **DESIGN METHODS:** Architectural Design Process, Transform Mapping and Transaction Mapping, Interface Design, - Internal and External Design, Human Computer Interface Design, Interface Design Guidelines, Procedural Design.	8	20
4	**UNIT–IV** **SOFTWARE QUALITY ASSURANCE** : Quality Concepts, Matrix for Software Quality, Quality Movement, Software Q A, Software Review,	8	20

	Formal Technical Reviews, Formal Approaches to SQA, Software Reliability, ISO 9000 quality Standards **SOFTWARE TESTING MODELS** : Software Testing Fundamentals, Test Case Design, White and Black Box Testing, Basic Path Testing, Control Structure **SOFTWARE TESTING STRATEGIES** : Strategic Approach To Software Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Debugging		
5	**UNIT–V** **SOFTWARE REUSE:** Reuse Process, Building Reuse Components, Classified And Retrieving Components, Economics of Software Reuse **COMPUTER AIDED SOFTWARE ENGINEERING:** Introducing of Case, Building Block For Case, Taxonomy Of Case Tools, Integrating Case Environment, Integrating Architecture, Case Repository.	8	20
	Total	**42**	

Reference Books:

1. Software Engineering- A practitioner's Approach, Roger S.Pressman, McGraw-Hill International Editions
2. Software Engineering, Ian Sommerville, Pearson education Asia
3. Software Engineering, N.S. Gill, Khanna Publishing House
4. Software Engineering, R.P. Mahapatra, Khanna Publishing House

Suggested Specification table with Marks (Theory): (For BVOC only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	20	0	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO-1	Understand concepts of software and software development cycle.	20
CO-2	Understand software project planning and analysis.	20
CO-3	Understand design concepts and principles.	20
CO-4	Apply various testing models and testing strategies.	20
CO-5	To develop computer aided software engineering.	20

Laboratory work: NA

List of Open Source Software/learning website:

Students must refer to following sites to enhance their learning ability.

- www.en.wikipedia.org/wiki/Software_engineering
- www.win.tue.nl
- www.rspa.com/spi
- www.onesmartclick.com/engsineering/software-engineering.html
- https://www.edx.org/school/uc-berkeleyx