



Ganpat University
॥ विद्यया समाजोत्कर्षः ॥

Faculty of
Computer Applications



Programme	BCA Honors (Cyber Security)				Branch	Computer Applications			
Semester	II				Version	1.0.0.0			
Effective from Academic Year			2026-2027		Effective for the batch Admitted in			June 2026	
Subject Code	U102B3SE		Subject Name		SOFTWARE ENGINEERING				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4		-	-	4	Theory	50	50	100
Hours	4		-	-	4	Practical	-	-	-
Objective:									
By the completion of this course, students will be able to understand the development process of software engineering, different software process models, Understanding about UML Diagram, project planning, project scheduling, software risk analysis.									
Pre-requisites:									
Students should have a good working understanding of basic knowledge of the process of software development.									
Course Outcomes :									
Name of CO	Description								
C01	Understand fundamental concepts of software engineering								
C02	Analyze and compare software process models								
C03	Apply requirement engineering techniques								
C04	Design software systems using standard models								
C05	Understand testing, maintenance, and secure software practices								
Mapping of CO and PO									
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
C01	3	3	1	0	0	0	1	1	
C02	3	3	0	0	0	0	1	2	
C03	2	2	0	0	0	2	1	3	
C04	2	3	0	0	0	1	1	1	
C05	2	3	2	1	0	0	1	1	
Content:									
Unit									Hrs

1	Introduction to Software Engineering Definition and Nature of Software, Software Engineering: Meaning, Objectives, and Scope, Evolution of Software Engineering, Software Crisis and Challenges, Characteristics of Good Software, Types of Software Systems, Role of Software Engineering in Cyber Security, Professional Ethics and Responsibilities	15
2	Software Process Models Software Development Life Cycle (SDLC), Phases of SDLC, Waterfall Model, COCOMO, RAD Model, Incremental Model, Spiral Model, Agile Software Development Model, DevOps Model (Introduction), Secure Software Development Life Cycle (SSDLC)	16
3	Software Requirements Engineering Requirements Engineering Process, Functional and Non-Functional Requirements, Requirement Elicitation Techniques, Requirement Analysis and Modeling, Software Requirement Specification (SRS), Feasibility Study, Requirement Validation and Management, Security Requirements in Software Systems	11
4	Software Design Software Design Concepts and Principles, Architectural Design, Modular Design, Cohesion and Coupling, Data Flow Diagrams (DFD), Unified Modeling Language (UML): Use Case Diagram, Class Diagram, Sequence Diagram. Secure Design Principles	11
5	Software Testing and Maintenance Fundamentals of Software Testing, Levels of Testing: Unit Testing, Integration Testing, System Testing, Acceptance Testing, Black Box and White Box Testing Techniques. Software Maintenance, Types of Maintenance, Introduction to Secure Coding and Security Testing, Software Re-engineering	07

Practical Content:

Not Applicable

Text Books:

1 Software Engineering, by Roger Pressman (6th Edition)

Reference Books:

1 Software Engineering, by Ian Sommerville, Addison Wesley

2 Fundamentals of Software Engineering, by Rajib Mall, Prentice Hall of India

Web References / MOOC / Certification Course

1 <https://www.javatpoint.com/software-engineering-tutorial>

2 https://www.tutorialspoint.com/software_engineering/index.htm

3 <https://www.guru99.com/what-is-software-engineering.html>

4 https://onlinecourses.nptel.ac.in/noc19_cs69/preview

5 <https://www.edx.org/learn/software-engineering>

6 <https://www.coursera.org/learn/introduction-to-software-engineering>

Question Paper Scheme:

End Semester Examination Duration: (2 Hours Theory Examination)

Note for Examiner: -

Q-1 Any Five out of Seven (25 Marks)

Q-2 Any Two out of Three (06 Marks)

Q-3 Mandatory question (05 Marks)

Q-4 Any Two out of Three (08 Marks)

Q-5 Any Two out of Three (06 Marks)

The question paper must comprehensively address all Course Outcomes (COs), align Taxonomy levels, and ensure complete syllabus coverage.