DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS
KURUKSHETRA UNIVERSITY, KURUKSHETRA

Scheme: 2023-24, Syllabus: 2024-25			
Part A - Introduction			
Subject	BCA		
Semester	V		
Name of the Course	Software Engineering		
Course Code	B23-CAP-501		
Course Type: (CC/MCC/MDC/CC-M/DSEC/VOC/DSE/PC/AEC/VAC)	CC-A5		
Level of the course (As per Annexure-I	300-399		
Pre-requisite for the course (if any)	Knowledge of any Programming language		
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: 1. learn the various models for software development. 2. understand how to analyze software. 3. plan a software design and the risks associated with software. 4. test and validate software 5*. Implement the various tools and techniques used in software engineering.		
Credits	Theory	Practical	Total
	3	1	4
Contact Hours	3	2	5
Max. Marks:100(70(T)+30(P)) **Internal Assessment Marks:30(20(T)+10(P))** **End Term Exam Marks: 70(50(T)+20(P))**		**Time: 3 Hrs.(T), 3Hrs.(P)**	
Part B- Contents of the Course			

Instructions for Paper-Setter

The examiner will set a total of nine questions. Out of which first question will be compulsory. Remaining eight questions will be set from four unit selecting two questions from each unit. The examination will be of three-hour duration. All questions will carry equal marks. The first question will comprise short answer-type questions covering the entire syllabus.

Candidate will have to attempt five questions in all, selecting one question from each unit. First question will be compulsory.

The practicum will be evaluated by an external and an internal examiner. The examination will be of three-hour duration.

Unit	Topics	Contact Hours
I	Introduction: Program vs. Software, Software Engineering, Programming paradigms, Software Crisis – problem and causes, Phases in Software development: Requirement Analysis, Software Design, Coding, Testing, Maintenance, Software Development Process Models: Waterfall, Prototype, Evolutionary and Spiral models, Role of Metrics.	11
II	Feasibility Study, Software Requirement Analysis and Specifications: SRS, Need for SRS, Characteristics of an SRS, Components of an SRS, Problem Analysis, Information gathering tools, Requirement specification, validation and metrics. Structured Analysis and Tools: Data Flow Diagram, Data Dictionary, Decision table, Decision trees, Structured English, Entity-Relationship diagrams	11
III	Software Project Planning: Cost estimation: COCOMO model, Project scheduling, Staffing, and personnel planning, team structure, Software configuration management, Quality assurance plans, Project monitoring plans, Risk Management. Software Design: Design fundamentals, problem partitioning, and abstraction, design methodology, Cohesion & Coupling.	12
IV	Software testing strategies: unit testing, integration testing, Validation testing, System testing, Alpha and Beta testing. Software Maintenance: Type of maintenance, Management of Maintenance, Maintenance Process, maintenance characteristics.	11
V*	Practicum: Students are advised to do laboratory/practical practice not limited to but including the following types of problems: • Development of 0-level DFD • Development of 1 level DFD • Development of 2-level DFD • data dictionary, • E-R diagram for Student Teacher Relationship • E-R diagram for Library Management, • Draw an ER Diagram for the Hospital Management System. • ER diagram for (ANY 5) • Student Result Management System • Library management system • Inventory control system • Accounting system • Fast food billing system • Bank loan system • Blood bank system • Railway reservation system • Automatic teller machine • Video library management system • Hotel management system • Hostel management system	30

<table>
<tr><td></td><td>• E-ticking
• Share online trading
• Hostel management system
• Resource management system
• Court case management system</td><td></td></tr>
<tr><td colspan="3"><b>Suggested Evaluation Methods</b></td></tr>
<tr><td colspan="2"><b>Internal Assessment:</b>
➢ <b>Theory</b>
• Class Participation: 5
• Seminar/presentation/assignment/quiz/class test etc.: 5
• Mid-Term Exam: 10
➢ <b>Practicum</b>
• Class Participation: NA
• Seminar/Demonstration/Viva-voce/Lab records etc.: 10
• Mid-Term Exam: NA</td><td><b>End-Term Examination:</b>
A three-hour exam for both theory and practicum.
<b>End Term Exam Marks: 70(50(T)+20(P))</b></td></tr>
<tr><td colspan="3"><b>Part C-Learning Resources</b></td></tr>
<tr><td colspan="3"><b>Recommended Books/e-resources/LMS:</b>
• Pressman R. S., “Software Engineering – A Practitioner’s Approach”, Tata McGraw Hill.
• Jalote P., “An Integrated Approach to Software Engineering”, Narosa.
• Sommerville, “Software Engineering”, Addison Wesley.
• Fairley R., “Software Engineering Concepts”, Tata McGraw Hill.
• James Peter, W Pedrycz, “Software Engineering”, John Wiley &amp; Sons.</td></tr>
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*Applicable for courses having practical components.