Department of Computer Science Engineering – (Data Science)

COURSE MODULE OF THE SUBJECT TAUGHT FOR THE SESSION 2025-26 (ODD SEM)

Course Syllabi with CO's

Faculty Name: Dr. Vinod Kumar P			Academic Year: 2025 - 2026				
Department: Computer Science & Engineering- Data Science							
Course Code	**Course Title**	**Core / Elective**	**Prerequisite**	**Contact Hours**			**Total Hrs/ Sessions**
				L	**T**	**P**	
BCS501	Software Engineering & Project Management	Core	Data Structures and Algorithms & Software Tools Familiarity	4	0	0	50
Course Objectives	**This course will enable students to:** **CLO 1:** Outline software engineering principles and activities involved in building large software programs. Identify ethical and professional issues and explain why they are of concern to Software Engineers. **CL0 2:** Describe the process of requirement gathering, requirement classification, requirement specification and requirements validation. **CLO 3:** Recognize the importance of Project Management with its methods and methodologies. **CL0 4:** Identify software quality parameters and quantify software using measurements and metrics. **CL0 5:** List software quality standards and outline the practices involved.						
Topics Covered as per Syllabus							

Module-1

Software and Software Engineering: The nature of Software, The unique nature of WebApps, Software Engineering, The software Process, Software Engineering Practice, Software Myths.

Process Models: A generic process model, Process assessment and improvement, Prescriptive process models: Waterfall model, Incremental process models, Evolutionary process models, Concurrent models, Specialized process models. Unified Process , Personal and Team process Models. 10 Hours

Module-2

Understanding Requirements: Requirements Engineering, Establishing the ground work, Eliciting, Requirements, Developing use cases, Building the requirements model, Negotiating Requirements, Validating Requirements.

Requirements Modeling Scenarios, Information and Analysis classes: Requirement Analysis, Scenario based modeling, UML models that supplement the Use Case, Data modeling Concepts, Class-Based Modeling.

Requirement Modeling Strategies : Flow oriented Modeling , Behavioral Modeling. 10 Hours

Module-3

Agile Development: What is Agility?, Agility and the cost of change. What is an agile

Process?, Extreme Programming (XP), Other Agile Process Models, A tool set for Agile process .

Principles that guide practice: Software Engineering Knowledge, Core principles, Principles that guide each framework activity. 10 Hours

Module-4

Introduction to Project Management:

Introduction, Project and Importance of Project Management, Contract Management, Activities Covered by Software Project Management, Plans, Methods and Methodologies, Some ways of categorizing Software Projects, Stakeholders, Setting Objectives, Business Case, Project Success and Failure, Management and Management Control, Project Management life cycle, Traditional versus Modern Project Management Practices.

Project Evaluation: Evaluation of Individual projects, Cost–benefit Evaluation Techniques, Risk Evaluation 10 Hours

.

Module-5

Software Quality: Introduction, The place of software quality in project planning, Importance of software quality, Defining software quality, Software quality models, product versus process quality management. Software Project Estimation: Observations on Estimation, Decomposition Techniques, Empirical Estimation Models. 10 Hours

List of Textbook and Reference book

Textbooks:

1. Roger S. Pressman: Software Engineering-A Practitioners approach, 7th Edition, Tata McGraw Hill.
2. Bob Hughes, Mike Cotterell, Rajib Mall: Software Project Management, 6th Edition, McGraw Hill Education, 2018.

Reference Book:

3. Pankaj Jalote: An Integrated Approach to Software Engineering, Wiley India.
4. "Software Engineering: Principles and Practice", Hans van Vliet, Wiley India, 3rd Edition, 2010

Web links and Video Lectures (e-Resources)

1. https://onlinecourses.nptel.ac.in/noc20_cs68/preview
2. https://onlinecourses.nptel.ac.in/noc24_mg01/preview

Course Outcomes	At the end of the course, the student will be able to: 1. CO1: **Differentiate** process models to judge which process model has to be adopted for the given scenarios. 2. CO2: **Derive** both functional and nonfunctional requirements from the case study. 3. CO3: **Analyze** the importance of various software testing methods and agile methodology. 4. CO4: **Illustrate** the role of project planning and quality management in software development. 5. CO5: **Identify** appropriate techniques to enhance software quality.

Assessment Details (both CIE and SEE)

The Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) each carry 50% weightage. To pass, a student must secure at least 20 marks out of 50 in CIE (40%) and 18 marks out of 50 in SEE (35%), and an overall minimum of 40 marks out of 100 when both are combined.

CIE consists of 25 marks for assignments (using methods as per 22OB2.4, with project-based assignments limited to one) and 25 marks for two internal assessment tests conducted at around 40–50% and 85–90% syllabus coverage. The tests are designed based on Bloom's taxonomy, and CIE marks are the scaled sum of tests and other assessments. SEE is a 3-hour university exam with a common paper containing 10 questions (2 per module), and students must answer 5 full questions (one from each module); marks obtained are proportionally scaled to 50.

Activity Based Learning (Suggested Activities in Class)/Practical-Based Learning

● Demonstration of Agile tool: The students are expected to learn any of the popular agile tool. (10 marks)

● Field Survey (In Team): The students' team may of the size of 2 or 4. Students are expected to visit their library and understand the Library Automation Software. OR they have to understand the working of ERP or any inventory management, and then they have to prepare a report and then to be submitted to the concerned staff. Prepare a document/report which includes all the phases of SDLC and to be submitted accordingly (15 marks)

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Course Code	BCS501	TITLE: Software Engineering & Project Management					Faculty Name		Dr. Vinod Kumar P		
List of Course Outcomes	Program Outcomes										
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO-1	2	3	3	-	-	3	3	-	-	-	-	-
CO-2	2	3	3	-	3	-	-	-	-	-	-	-
CO-3	2	3	-	-	2	-	-	-	-	-	-	-
CO-4	2	-	-	-	3	-	-	-	3	2	3	3
CO-5	2	-	-	-	-	-	-	-	2	-	2	2

Note: 3 = Strong Contribution, 2 = Average Contribution, 1 = Weak Contribution, - = No Contribution

The Correlation of Course Outcomes (CO's) and Program Specific Outcomes (PSO's)

Course Code	BCS501	Title: Software Engineering & Project Management	Faculty name: Dr. Vinod Kumar P
List of Course Outcomes	Program Specific Outcomes		
	PSO1	PSO2	PSO3
CO1	2	-	-
CO2	2	-	-
CO3	2	-	-
CO4	2	-	-
CO5	2	-	-

Note: 3 = Strong Contribution, 2 = Average Contribution, 1 = Weak Contribution, - = No Contribution