

Software Engineering & Project Management		Semester	V
Course Code	BCS501	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	4:0:0:0	SEE Marks	50
Total Hours of Pedagogy	52 hours	Total Marks	100
Credits	04	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives: This course will enable students to, <ul style="list-style-type: none">• 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.• Describe the process of requirement gathering, requirement classification, requirement specification and requirements validation.• Recognize the importance of Project Management with its methods and methodologies.• Identify software quality parameters and quantify software using measurements and metrics. List software quality standards and outline the practices involved.			
Teaching-Learning Process (General Instructions) These are sample Strategies; that teachers can use to accelerate the attainment of the various course outcomes. <ul style="list-style-type: none">1. Lecturer method (L) need not be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.2. Use of Video/Animation to explain functioning of various concepts.3. Encourage collaborative (Group Learning) Learning in the class.4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.5. Adopt Problem Based-Learning (PBL), which fosters student’s Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it.			
MODULE-1		10 hours	
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			
Textbook 1: Chapter 1: 1.1 to 1.6, Chapter 2: 2.1 to 2.5			
MODULE-2		12 hours	
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. Textbook 1: Chapter 5: 5.1 to 5.7, Chapter 6: 6.1 to 6.5, Chapter 7: 7.1 to 7.3			
MODULE-3		10 hours	

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.

Textbook 1: Chapter 3: 3.1 to 3.6, Chapter 4: 4.1 to 4.3

MODULE-4

10 hours

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

Textbook 2: Chapter 1: 1.1 to 1.17 , Chapter 2: 2.4 to 2.6

MODULE-5

10 hours

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.

Textbook 2: Chapter 13: 13.1 to 13.5, 13.7, 13.8, Text Book 1: Chapter 26: 26.5 to 26.7

Course Outcomes

At the end of the course, the student will be able to:

- **Differentiate** process models to judge which process model has to be adopted for the given scenarios.
- **Derive** both functional and nonfunctional requirements from the case study.
- **Analyze** the importance of various software testing methods and agile methodology.
- **Illustrate** the role of project planning and quality management in software development.
- **Identify** appropriate techniques to enhance software quality.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at

the end of the semester if two assignments are planned.

- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

The Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
3. The students have to answer 5 full questions, selecting one full question from each module.

Marks scored shall be proportionally reduced to 50 marks. .

Suggested Learning Resources:

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):

- https://onlinecourses.nptel.ac.in/noc20_cs68/preview
- https://onlinecourses.nptel.ac.in/noc24_mg01/preview

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)