

The academic resources available in VIT –

VMIS (ERP)	V-Refer and V-Live	VIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VIT library has many resources e:g :- IEEE, Nimbus, xplora, EBSCO etc.	Watch former lectures captured in LMS at VIT

### 1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	To understand Concepts, processes and standards used in software Development.
Affective	What do you want students to think / care about?	To think about the proper process model to be applied and create user friendly software.
Behavioural	What do you want students to be able to do?	To design, test and implement software as per user requirements.

#### Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if, what you understand is correct.

The v-Refer Link : <http://vidyalankarlive.com/vrefer/index.php/s/zSWnhjYCSNwaw2s>

Creation of microsite or team's link : <https://tinyurl.com/yaa39htf>

#### Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

**1.b****Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)**

CO No.	Statements	Related Module/s
CO1	Define various software application domains and remember different process model used in software development.	2
CO2	Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.	3
CO3	Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering in PLC.	2, 4
CO4	Apply testing to assure quality in software solution and Identify risks, manage the change to assure quality in software projects.	6
CO5	Understand the core concepts and features of Web Technology	1
CO6	Design static web pages using HTML5 and CSS3	1, 5

**1.c****Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)**

	Mapped to Learning Outcomes
CO1	2.1 Define software process models and distinguish between prescriptive and agile models
CO2	3.1 Define various types of software requirements with suitable examples 3.2 Identify and gather requirements through various elicitation techniques 3.3 Document system requirements in the form of a structured SRS.
CO3	2.2 Analyse the applicability of different process models for varying types of software projects. 2.3 Evaluate the benefits and limitations of iterative and incremental development methodologies 2.4 Apply process selection strategies in hypothetical or real-world project planning scenarios 3.3 Document system requirements in the form of a structured SRS. 3.4 Analyse and refine gathered requirements into clear and actionable software specifications. 4.1 Explain various software project estimation models including LOC, FP, and COCOMO 4.2 Apply Work Breakdown Structure (WBS) to define tasks in a software project 5.1 Define core software design concepts and principles.
CO4	4.3 Develop and track project schedules using timeline charts and Gantt charts. 4.4 Analyse project metrics to assess progress and predict project completion 6.1 Explain the role of testing in assuring software quality and identify different testing strategies 6.2 Identify, assess, and manage software project risks using appropriate techniques 6.3 Describe software configuration management processes including version and change control 6.4 Apply risk mitigation and monitoring techniques in software projects
CO5	1.1 Recall and use basic HTML tags to construct static web pages. (P.I. – 1.4.1 and 5.1.1) 1.3 Develop interactive web pages using JavaScript for basic DOM manipulation.
CO6	1.2 Apply CSS rules (internal, external, grid) for effective webpage styling and layout. 1.4 Reframe a web application into interconnected subsystems using HTML, CSS, and JavaScript modules. 1.5 Explore additional tools and techniques for enhancing web pages beyond the curriculum. 5.2 Explain interaction design fundamentals and their importance in software usability. 5.3 Apply design heuristics and golden rules in developing user-centric software designs.

**1.d****Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '-': not mapped)**

(List of POs is available in V-refer)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
	Knowledge A	Analysis	Design	Investigation	Modern Tools	Society	Environment & sustainability	Ethics T	Teamwork C	Communication	Project Mgt	Life long learning
CO 1	W	W		-	-	-	-	-	-	-	-	W
CO 2	W	W	M	-	-	-	-	W	W	-	-	W
CO 3	W	W	S	W	W	-	-	-	W	M	-	W
CO 4	W			S	W	-	-	-	-	M	-	W
CO 5	M			-	S	-	-	-	-	-	W	M
CO6	W	W	M	W	M	-	-	-	-	-	M	W

**1.e****Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '-': not mapped)**

	PSO 1	PSO 2	PSO 3
CO 1	S	M	M
CO 2	W	W	W
CO 3	M	M	M
CO 4	S	M	W
CO 5	M	W	M
CO6	S	M	M

**1.f****Teaching and Examination Scheme (As specified by the autonomous syllabus) for the Course**

Verticals	BSC/ESC	Program Courses	Multidisciplinary Courses	Skill Courses	HSSM	Experiential Learning	Liberal Learning
Tick suitable category		√					

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
PCCE12T	Software Engineering	2	-	-		-		
PCCE12P	Web Development Lab	-	2		-			

Subject Code	Subject Name	Examination Scheme							
		Theory			Total (Theory)	Practical			Total (Practical)
		ISA	MSE	ESE		ISA	ESE	ORAL	
PCCE12T	Software Engineering	15	20	40	75	-	-	-	-
PCCE12P	Web Development Lab	-	-	-	-	25	-	25	50

Subject Code	Subject Name	MSE-1*		
		Q, No	Module wise % Distribution	Relevant to Bloom Taxonomy
PCCE12T	Software Engineering	Q1. A, 1.B, 2.A	Module 2 - 57.14 %	Evaluate, Analyse, Apply
		Q1. C	Module 1- 14.28 %	Apply
		Q2. B	Module 3 - 28.57 %	Analyse

Subject Code	Subject Name	MSE-2*		
		Q, No	Module wise % Distribution	Relevant to Bloom Taxonomy
PCCE12T	Software Engineering	Q1. A, Q2. B	Module 4 – 42.85 %	Analyse, Apply
		Q1. C	Module 5 – 14.28 %	Apply
		Q1. B, Q2. A	Module 6 – 42.85 %	Understand, Analyse

Subject Code	Subject Name	ESE#		
		Q, No	Distribution	Relevant to Bloom Taxonomy
PCCE12T	Software Engineering	Q1C	Module 1 – 6.66 %	Apply
		Q1A,	Module 2 – 6.66 %	Analyses
		Q2B	Module 3 – 13.33 %	Apply
		Q4 B	Module 4 - 13.33 %	Apply
		Q3 B, Q4 A	Module 5 – 26.66 %	Understand, Apply
		Q1B, Q2A, Q3A	Module 6 -33.33 %	Understand, Analyse, Analyse

\* **Recommended distribution:** - 30 Marks from Assignments, 40 marks based on assignments with slightly enhance difficulty /complex, 30 marks from thought provoking

# **Recommended distribution:** - 30 Marks from Assignments, 40 marks based on assignments/MSE with slightly enhance difficulty /complex, 30 marks from thought provoking

## 1.g

### Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
<b>A</b>	DN (2)	DN (2)	DN (2)	DN (2)	-	-	-	-	-
<b>B</b>	DN (2)	DN (2)	DN (2)	DN (2)	-	-	-	-	-
<b>C</b>	DN (2)	DN (2)	SJN (2)	SJN (2)	-	-	-	-	-

**1.h****Office Hours (Faculty will be available in office in this duration for solving students' query)**

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
A	Monday	4-5 pm	M209
B	Tuesday	4-5 pm	M209
C	Wednesday	4-5 pm	M209

**2.a****Syllabus: Module Wise Teaching Hours and % Weightage in autonomous syllabus Question Paper**

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in autonomous syllabus Question Papers			Performance Indicator Mapping
			ISA	MSE	ESE	
1	<b>Introduction to Web Programming and Concepts:</b> Introduction to HTML, HTML Document Structure, Text Elements, Images and Attributes, Hyperlinks, Semantic HTML, Complex Image Maps, Tables and Nested Tables, Inserting Web Page Components, Setting and Modifying Field Properties, Validating HTML. <b>CSS:</b> Internal and External CSS, CSS Grid Overview, Sizing Grid Columns and Rows, Building a Simple CSS Grid Layout. <b>JavaScript &amp; Document Object Model:</b> Introduction to JavaScript, Variables and Objects, Decision Making Statements, Loops, Arrays, Functions and Prototypes, Core JavaScript Objects, DOM Introduction, Event Model.	2	12.5%	14.28 %	6.66 %	P.I. – 1.4.1, 5.1.1, 4.3.1, 12.2.1, 2.2.1,
Learning Outcome-1.1	Recall and use basic HTML tags to construct static web pages. (P.I. – 1.4.1 and 5.1.1) (CO5)					
Learning Outcome-1.2	Apply CSS rules (internal, external, grid) for effective webpage styling and layout. (P.I. – 5.2.1 and 4.3.1) (CO6)					
Learning Outcome-1.3	Develop interactive web pages using JavaScript for basic DOM manipulation. (P.I. – 1.4.1, 5.1.1, and 12.2.1) (CO5)					
Learning Outcome-1.4	Reframe a web application into interconnected subsystems using HTML, CSS, and JavaScript modules. (P.I. – 2.2.1) (CO6)					
Learning Outcome-1.5	Explore additional tools and techniques for enhancing web pages beyond the curriculum. (P.I. – 12.2.1) (CO6)					
2	<b>The Software Process Contents:</b> Generic View of Process, Prescriptive Process Models: Waterfall Model, Incremental-RAD Model, Evolutionary Process Models: Prototyping, Spiral.	7	7.5%	57.14 %	6.66 %	P.I. – 1.4.1, 2.1.1, 3.2.1, 5.2.1, 11.2.1

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in autonomous syllabus Question Papers			Performance Indicator Mapping
			ISA	MSE	ESE	
	Agile Methodology: Scrum and Extreme Programming					
Learning Outcome-2.1	Define software process models and distinguish between prescriptive and agile models. (P.I. – 1.4.1 and 2.1.1) (CO1)					
Learning Outcome-2.2	Analyse the applicability of different process models for varying types of software projects. (P.I. – 2.1.1 and 3.2.1) (CO3)					
Learning Outcome-2.3	Evaluate the benefits and limitations of iterative and incremental development methodologies. (P.I. – 3.2.1 and 5.2.1) (CO3)					
Learning Outcome-2.4	Apply process selection strategies in hypothetical or real-world project planning scenarios. (P.I. – 1.4.1 and 11.2.1) (CO3)					
3	Requirements Engineering and Analysis <b>Contents:</b> Requirement – Types of Requirements, Requirement Gathering, Requirement Engineering Tasks, Software Requirement Specification (SRS), IEEE Standard for SRS, Use Case Diagrams for Requirement Modelling.	7	7.5%	28.57 %	13.33 %	P.I. – 1.4.1, 2.1.1, 3.1.2, 9.2.1, 10.1.1, 3.4.1
Learning Outcome-3.1	Define various types of software requirements with suitable examples. (P.I. – 1.4.1 and 2.1.1) (CO2)					
Learning Outcome-3.2	Identify and gather requirements through various elicitation techniques. (P.I. – 3.1.2 and 9.2.1) (CO2)					
Learning Outcome-3.3	Document system requirements in the form of a structured SRS. (P.I. – 3.1.2 and 10.1.1) (CO2, CO3)					
Learning Outcome-3.4	Analyse and refine gathered requirements into clear and actionable software specifications. (P.I. – 3.2.1 and 3.4.1) (CO3)					
4	Software Estimation and Scheduling <b>Content:</b> Management Spectrum, 4Ps (People, Product, Process), Process and Project Metrics, Software Project Estimation: LOC, FP, Empirical Estimation Models (COCOMO), Project Scheduling: WBS, Defining Task Sets, Timeline Charts, Schedule Tracking	7	15%	42.85 %	13.33 %	P.I. – 1.4.1, 4.3.1, 11.2.1, 5.2.1
Learning Outcome-4.1	Explain various software project estimation models including LOC, FP, and COCOMO. (P.I. – 1.4.1, 4.3.1) (CO3)					
Learning Outcome-4.2	Apply Work Breakdown Structure (WBS) to define tasks in a software project. (P.I. – 11.2.1) (CO3)					
Learning Outcome-4.3	Develop and track project schedules using timeline charts and Gantt charts. (P.I. – 11.2.1, 5.2.1) (CO4)					
Learning Outcome-4.4	Analyse project metrics to assess progress and predict project completion. (P.I. – 4.3.1) (CO4)					

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in autonomous syllabus Question Papers			Performance Indicator Mapping
			ISA	MSE	ESE	
5	Design Engineering <b>Content:</b> Software Design Concepts, Interaction Design, Design Golden Rules and Heuristics, Design patterns overview, User interface design best practices	5	7.5%	14.28 %	26.66%	1.4.1, 3.4.1, 3.2.1, 5.1.1
Learning Outcome-5.1	Define core software design concepts and principles. (P.I. – 1.4.1, 3.4.1) (CO3)					
Learning Outcome-5.2	Explain interaction design fundamentals and their importance in software usability. (P.I. – 3.2.1) (CO6)					
Learning Outcome-5.3	Apply design heuristics and golden rules in developing user-centric software designs. (P.I. – 3.4.1, 5.1.1) (CO6)					
6	Software Testing and Risk Management <b>Contents:</b> Software Quality, Testing: Strategic Approach, Strategies for Conventional Software Testing, Risk Management: Risk Identification, Risk Assessment, Risk Projection, Risk Mitigation, Monitoring and Management (RMMM), Software Configuration Management (SCM) Process – Version Control, Change Control.	2	10%	42.85 %	33.33%	P.I. – 1.4.1, 4.3.1, 11.2.1, 5.1.1, 5.2.1
Learning Outcome-6.1	Explain the role of testing in assuring software quality and identify different testing strategies. (P.I. – 1.4.1, 4.3.1) (CO4)					
Learning Outcome-6.2	Identify, assess, and manage software project risks using appropriate techniques. (P.I. – 4.3.1, 11.2.1) (CO4)					
Learning Outcome-6.3	Describe software configuration management processes including version and change control. (P.I. – 5.1.1, 5.2.1) (CO4)					
Learning Outcome-6.4	Apply risk mitigation and monitoring techniques in software projects. (P.I. – 4.3.1) (CO4)					
* Insert rows for more modules in the Course		<b>Total</b>	<b>30</b>			

Note: - As an attachment Annexure is required for assessment criteria of learning outcomes.

## 2.b Prerequisite Courses - Nil

No.	Semester	Name of the Course	Topic/s
1			

## 2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	VI	Project Management
2	VI	Product Life Cycle Management
3	VI, VII, VIII	Project

## 2.d

See :- Identify real life scenarios/examples which uses the knowledge of the subject , (Discussion on how to prepare examples and case studies e.g. [“Boeing Plane”: C Programming Language – Intro to Computer Science – Harvard’s CS50 \(2018\) – Bing video](#))

Real Life Scenario	Concept Used
Payroll management system	Analysis, Design, implementation, Testing and maintenance
Online shopping system	Analysis, Design, implementation, Testing and maintenance
Online banking	Analysis, Design, implementation, Testing and maintenance

## 3 Past Results – Division-Wise

Details	Target – DEC 2025	DEC 2024	MAY 2024	DEC 2022
Course Passing % – Average of 2 Divisions	100 %	100%	98.33 %	-
Marks Obtained by Course Topper (mark/100)	100	73	73	-

	Division A		Division B	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result
May 2024	SBJ and DJS	98.33 %	SBJ and DJS	98.33 %
Dec 2024	DN	100 %	DN	100%
May 2025				

## 4 All the Learning Resources – Books and E-Resources

### 4.a List of Textbooks (T – Symbol for Textbooks) to be Referred by Students

Sr. No	Textbook Titles	Author/s	Publisher	Edition	Module Nos.	Available in our Library
1	Software Engineering: A Practitioner 's Approach	Roger Pressman	McGraw-Hill Publications	-	1,2,3,4,5,6	Yes
2	Software Engineering	Ian Sommerville,	Pearson Education	9th edition	2,4	Yes



3	Software Engineering Fundamentals	Ali Behfroz and Fredeick J.Hudson	Oxford University Press	-	1,2,3,4,5,6	Yes
4	HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)		DT Editorial Services	2nd Edition	1	Yes

#### **4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students**

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.	Available in our Library
1	Software Engineering – Concepts and Practices	Ugrasen Suman	Cengage Learning	-	1,2,3,4,5,6	
2	An integrated approach to Software Engineering	Pankaj Jalote,	Springer/ Narosa	-	1,2,3,4,5,6	Yes
3	Software Engineering	Jibitesh Mishra and Ashok Mohanty	Pearson	-	1,2,3,4,5,6	Yes
4	Fundamentals of Software Engineering	Rajib Mall	Prentice Hall India	-	1,2,3,4,5,6	Yes

#### **4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students**

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.	Available in our Library
1	Software Engineering: A Practitioner's Approach	Roger Pressman	McGraw-Hill Publications	7th	1,2,3,4,5,6	Y
2	The Complete Reference – HTML CSS	Thomas Powell	McGraw-Hill Publications	5th	1	Y

**4.d****Reading latest / top rated research papers (at least 5 papers)**

Name of Paper	Name of Authors (Background)	Published in		Problem Statement	Available in our Library
		Date	Journal		
Future of Software Test Automation Using AI/ML	Harshad Vijay Pandhare	May 2025	International Journal Of Engineering And Computer Science	Quantitative comparisons between traditional and AI/ML-driven testing approaches	Yes
Generative Software Engineering	Yuan Huang, Yinan Chen, Xiangping Chen, Junqi Chen	April 2024	ArXiv	Existing reviews on pre-trained models and LLMs in software engineering lack a comprehensive analysis of their evolution and application in generative tasks. This paper addresses this gap by systematically reviewing their use in generative software engineering tasks.	Yes
A Practical Model for Agile Project Management to Streamline Engineering Delivery in Energy Projects	Oluwakemi Famoti, Bamidele Michael Omowole, Godwin Nzeako, Titilayo Priscilia Muiyiwa-Ajayi, Ogechukwu Nwanneka Ezechi, Chikezie Paul-Mikki Ewim, Hope Ehiaghe Omokhoa	Jan 2025	International Journal of Multidisciplinary Research and Growth Evaluation	Traditional project management methods like Waterfall are often ineffective in managing the dynamic and unpredictable nature of modern energy projects. There is a need for a more adaptable and responsive approach, such as Agile, to better address the complexities and evolving demands of these initiatives.	Yes
Predictive Analytics for Project Risk Management Using	Sanjay Ramdas Bauskar, Chandrakanth Rao Madhavaram,	Nov 2024	Journal of Data Analysis and Information Processing	Traditional risk management approaches in project management lack real-time adaptability and	Yes

Machine Learning	Eswar Prasad Galla, Janardhana Rao Sunkara, Hemanth Kumar Gollang, Shravan Kumar Rajaram			predictive capabilities. This study addresses the need for a data-driven, machine learning-based approach to proactively identify and manage project risks using historical data, aiming to improve accuracy, resource efficiency, and cost-effectiveness in risk mitigation.	
Software Testing With Large Language Models: Survey, Landscape, and Vision	Junjie Wang , Yuchao Huang , Chunyang Chen , Zhe Liu , Song Wang , Qing Wang	April 2024	IEEE Transactions on Software Engineering	As software systems grow in complexity, traditional software testing methods struggle to keep pace, necessitating innovative approaches. This paper addresses the need to explore and understand how pre-trained large language models (LLMs) can enhance software testing processes, by systematically reviewing their applications, effectiveness, challenges, and future opportunities in the field.	Yes

#### 4.e Based on research paper an identify the current Problem statement

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
Quantitative comparisons between traditional and					Yes		

AI/ML-driven testing approaches							
Systematic review of pre-trained models and LLMs in generative software engineering tasks					Yes		
Ineffectiveness of traditional project management methods (like Waterfall) in dynamic energy projects; need for Agile approach					Yes		
Traditional risk management lacks real-time adaptability; ML-based predictive analytics proposed					Yes		
Challenges in using traditional testing for complex software; explores use of Large Language Models (LLMs) in software testing					Yes		

#### 4.f

**Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Om Informatics & Turanth Logistics Pvt Ltd	√	√	

**4.g****Identify suitable relevant TOP Guest Speakers from Industry,****Example: - (CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)**

Name of the Identified Guest Speaker	Designation	Name of the Company
Mr. Yogesh Yewale <a href="https://www.linkedin.com/in/yogesh-yewale-31720b193/">https://www.linkedin.com/in/yogesh-yewale-31720b193/</a>	Software Development Engineer	Reliance Jio-Bp

**4.h****Identify relevant technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]**

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
SuPrathon 2K25	SuPrato Technologies and CodeElevate Academy	July 20, 2025
Code Crunch 305	CODECRUNCH.CS.FIU.EDU	20, 2025 - Sept. 22, 2025

**4.i****Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication**

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
IIT Kharagpur	Software Engineering <a href="https://cse.iitkgp.ac.in/~sourangshu/coursefiles/cs20202_2024s.html">https://cse.iitkgp.ac.in/~sourangshu/coursefiles/cs20202_2024s.html</a>	Prof. Abir Das and Prof. Sourangshu Bhattacharya	Presentation		
IIT Kharagpur	<a href="https://cse.iitkgp.ac.in/~dsamanta/courses/se/index.html#resources">https://cse.iitkgp.ac.in/~dsamanta/courses/se/index.html#resources</a>	Dr. Debasis Samanta	Presentation		
IIT Kharagpur	<a href="https://www.bing.com/videos/riverview/relatedvideo?q=rajib+mall+software+engineering&amp;mid=DE3D8009C176C9F1132FDE3D8009C176C9F1132F&amp;FORM=VIRE">https://www.bing.com/videos/riverview/relatedvideo?q=rajib+mall+software+engineering&amp;mid=DE3D8009C176C9F1132FDE3D8009C176C9F1132F&amp;FORM=VIRE</a>	Dr. Rajib Mall	Videos		

**4.j**

**Module Best Available in – Title of the best resource [from 4.a to 4.d in this AAP] and other details as necessary**

Module No.	Title of the Module	Textbook	Mention the Title					
			Reference Book	E-books	Journal	E-Journal	Available in our Library	V-refer
1	Introduction to Web Programming and Concepts	T4					Yes	
2	The Software Process	T1, T2					Yes	
3	Requirements Engineering and Analysis	T1					Yes	
4	Software Estimation and Scheduling	T1					Yes	
5	Design Engineering	T1					Yes	
6	Software Testing and Risk Management	T1					Yes	

**4.k**

**Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
Massachusetts Institute of Technology	Software Engineering Concepts (16.355J)	Prof. Nancy Leveson	Fall 2005	<a href="https://ocw.mit.edu/courses/16-355j-software-engineering-concepts-fall-2005/pages/lecture-notes/">https://ocw.mit.edu/courses/16-355j-software-engineering-concepts-fall-2005/pages/lecture-notes/</a>
Massachusetts Institute of Technology	Laboratory in Software Engineering (6.170)	Prof. Daniel Jackson	Fall 2005	<a href="https://ocw.mit.edu/courses/6-170-laboratory-in-software-engineering-fall-2005/">https://ocw.mit.edu/courses/6-170-laboratory-in-software-engineering-fall-2005/</a>
Massachusetts Institute of Technology	Software Engineering for Web Applications	Prof. Hal Abelson, Philip Greenspun	Fall 2003	<a href="https://ocw.mit.edu/courses/6-171-software-engineering-for-web-applications-fall-2003/">https://ocw.mit.edu/courses/6-171-software-engineering-for-web-applications-fall-2003/</a>
University of Virginia	Agile meets design thinking	Alex Cowan	Self Paced	<a href="https://www.coursera.org/learn/uva-darden-getting-started-agile">https://www.coursera.org/learn/uva-darden-getting-started-agile</a>
NPTEL (IIT Madras)	Software Engineering	Prof. Rajib Mall (IIT KGP)	July–Dec 2018	<a href="https://nptel.ac.in/courses/106105087">https://nptel.ac.in/courses/106105087</a>

**4.l Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	
Software Engineering by Rajib Mall	NPTEL	12 weeks	Yes		May 2020		

**4.m Completed subject wise/cluster wise training with cluster mentor. List of relevant Refresher Course Identified / Done**

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				
PBL				
Sub. Content Training				

**4.n Best Practices Identified and adopted**

No.	Item	Best Practices Identified		
		IIT Kharagpur Dr. Debasis Samanta	IIT Kharagpur Prof. Rajib Mall	Massachusetts Institute of Technology Prof. Nancy Leveson
1	Microsite	Yes – Course website with lecture slides and structure	Yes – NPTEL course microsite	Yes – OCW course page with structure
2	Video Lectures		<b>Yes</b>	
3	Assignments	Yes	Yes	Yes
4	Mini Project			<b>Yes</b>
5	Assessment Metric		Yes	Yes
6	Quizzes		<b>Yes</b>	Yes
7	Labs/ Practical (PBL)			
8	Tests			
9	Peer Assessment			
10	Any Other	Presentation-based delivery with self-study emphasis	YouTube availability, recognized NPTEL certification	Publicly licensed OCW content for reuse

**4.o****Web Links for Online Notes/YouTube/VIT Digital Content/VIT Lecture Capture/NPTEL Videos**

Students can view lectures by VIT professors, captured through LMS 'Lecture Capture' in VIT campus for previous years.

No.	Websites / Links	Module Nos.
1	<a href="http://freevideolectures.com/Course/2318/Software-Engineering">http://freevideolectures.com/Course/2318/Software-Engineering</a>	2,3,4,5,6
2	<a href="https://freevideolectures.com/subject/web-designing/">https://freevideolectures.com/subject/web-designing/</a>	1

**4.p****Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.**

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	<a href="https://www.coursera.org/professional-certificates/ibm-it-scrum-master">https://www.coursera.org/professional-certificates/ibm-it-scrum-master</a>	IBM	3 months	Y
2	<a href="https://www.coursera.org/specializations/software-engineering-fundamentals">https://www.coursera.org/specializations/software-engineering-fundamentals</a>	IBM	2 months	Y
3	<a href="https://www.coursera.org/learn/project-management-foundations">https://www.coursera.org/learn/project-management-foundations</a>	Google	12 Hours	Y

**5****Consolidated Course Lesson Plan**

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	7 <sup>th</sup> July, 2025		

Week	Lecture no.	Module No.	Lecture Topics / MSE / BSA planned to be covered	Actual date of Completion (Handwritten)	COs Mapped	Mapping Bloom Taxonomy level	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	2	Generic view of Process, Prescriptive Models: Waterfall Model, Incremental-RAD Model, Evolutionary Process Model-Prototyping, Spiral		5	Understand		T4 / CH2/31
	2				6			
	3	2	Agile Methodology, Scrum and Extreme Programming		5	Understand		T4 / CH2/31
2	5 6	3	Requirement, Types of Requirements, Engineering Task		6	Understand		
3	7	3	Requirement Gathering , SRS (Software Requirement Specification)		5	Apply		T4 /ch-4/265
	8				6			



Week	Lecture no.	Module No.	Lecture Topics / MSE / BSA planned to be covered	Actual date of Completion (Handwritten)	COs Mapped	Mapping Bloom Taxonomy level	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	9 10	4	Management Spectrum, 4Ps (people, product and process), Process and Project metrics, Software Project Estimation: LOC, FP		5 6	Analyze		T1/ch- 1/3
4	11	4	Empirical Estimation Models - COCOMO Model		1 3	Apply		T1/ch- 3/65
5	13 14	4	Project scheduling: WBS, Defining a Task Set for the Software Project, Timeline charts, Tracking the Schedule		3	Apply		T1/ch- 5/128
	15 16	5	Software Design Concepts, Interaction Design, Design Golden Rules and Heuristics.		2	Understand		T1/ch - 5/128
6	17 18	6	Testing: Software Quality, Testing: Strategic Approach, Strategic Issues- Testing: Strategies for Conventional Software.		2	Understand		T1/ch- 26/692
	19 20	6	Risk Management: Risk Identification, Risk Assessment, Risk Projection, RMMM, Software Configuration management		3	Analyse		T1/ch- 27/721
7	21 22	6	SCM process- Version Control, Change Control		3	Apply		T1/ch- 27/721
	23 24	1	Introduction to HTML, HTML Document Structure Text Elements, Images and Attributes, Hyperlinks, Semantic HTML		3	Apply		T1/ch- 9/242
8	25 26	1	Complex image maps, tables and nested tables, Inserting web page, Setting & modifying field properties, Validating HTML		6	Apply		T1/ch- 17/449
	27	1	CSS: Internal and External CSS, CSS Grid Overview, Sizing Grid Columns and Rows, Building a		4	Apply		T1/ch- 28/744

Week	Lecture no.	Module No.	Lecture Topics / MSE / BSA planned to be covered	Actual date of Completion (Handwritten)	COs Mapped	Mapping Bloom Taxonomy level	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	28		Simple CSS Grid Layout					
9	29 30	1	JavaScript & Document Object Model: Introduction to JavaScript, Variables and Objects, Decision Making Statement, Loops, Arrays, Functions & Prototypes, Core JavaScript Objects, DOM Introduction, Event Model, Function		4	Apply		T1/ch-22/584
	1 2	2	Generic view of Process, Prescriptive Models: Waterfall Model, Incremental-RAD Model, Evolutionary Process Model-Prototyping, Spiral		4	Understand		T4 / CH2/31
10	3 4	2	Agile Methodology, Scrum and Extreme Programming		5 6	Understand		T4 / CH2/31
11	5 6	3	Requirement, Types of Requirements, Requirement Engineering Task		5	Understand		T4/CH 18/465
	7 8	3	Requirement Gathering , SRS (Software Requirement Specification)		6	Apply		T4 / part 4/265
12	9 10	4	Management Spectrum, 4Ps (people, product and process) , Process and Project metrics, Software Project Estimation: LOC, FP		5 6	Analyse		T1/ch- 1/3
	11	4	Empirical Estimation Models - COCOMO Model,		5 6	Apply		T1/ch-3/65
	13 14	4	Project scheduling: WBS, Defining a Task Set for the Software Project, Timeline charts, Tracking the Schedule		1 3	Apply		T1/ch-5/128

Week	Lecture no.	Module No.	Lecture Topics / MSE / BSA planned to be covered	Actual date of Completion (Handwritten)	COs Mapped	Mapping Bloom Taxonomy level	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
14	15 16	5	Software Design Concepts, Interaction Design , Design Golden Rules and Heuristics.		1	Understand		T1/ch-5/128
	17 18	6	Testing: Software Quality, Testing: Strategic Approach, Strategic Issues- Testing: Strategies for Conventional Software.		3	Understand		T1/ch-26/692
15	19 20	6	Risk Management: Risk Identification, Risk Assessment, Risk Projection, RMMM, Software Configuration management		2	Analyze		T1/ch-27/721
	21 22	6	SCM process- Version Control , Change Control		2	Apply		T1/ch-27/721
16	23 24	1	Introduction to HTML, HTML Document Structure Text Elements, Images and Attributes, Hyperlinks, Semantic HTML		3	Apply		T1/ch-9/242
	25 26	1	complex image maps, tables and nested tables, inserting web page, Setting & modifying field properties, Validating HTML		3	Apply		T1/ch-17/449

## 6

### Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

- Activity/ies should be designed as per reference of credit structure.
- If the subject is of 2 credit, activity/ assignment should be design for 2 hours with appropriate complexity and engaging time.

Theory (ISA= <u>15</u> )												Total
Class Participation	Activity-1	Activity-2	Activity-3	Activity-4	Activity-5	Activity-6	Activity-7	Activity-8	Activity-9	Activity-10	Activity-11	
4	1	1	1	1	1	1	1	1	1	1	1	15

Practical (ISA=25)														
Class Participation	Activity-1	Activity-2	Activity-3	Activity-4	Activity-5	Activity-6	Activity-7	Activity-8	Activity-9	Activity-10	Activity-11	Activity-12	Activity-13	Total
12	1	1	1	1	1	1	1	1	1	1	1	1	1	25

Class Participation	MSE-1	MSE-2	ESE	Total
<b>Theory ISA – Class Participation:</b> Class Test – 2 Pop Quiz – 2 <b>Lab ISA – Class Participation:</b> Mini Project - 6 Mini Project Paper - 6	20	20	40	105

## 7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Mapping Bloom Taxonomy Level	Assignment/ Tutorials given to Students on	Assignments to be submitted back on
1	<p>Q1. A company is developing a safety critical aerospace control system. The project is complex, requirements are unclear, and risks are high. Why is the Spiral Model more suitable than models like Waterfall or Incremental for this project?</p> <p>Explain with respect to:</p> <ol style="list-style-type: none"> <li>Risk handling</li> <li>Changing requirements</li> <li>Iterative development</li> </ol> <p>Q2. Case Analysis:</p> <p>For each of the following cases, answer:</p> <ol style="list-style-type: none"> <li>Which model suits each case: Prescriptive or Evolutionary?</li> <li>Give a short reason for each choice.</li> <li>What is a software process model?               <ul style="list-style-type: none"> <li>Case 1: A government project has fixed requirements and needs detailed planning.</li> </ul> </li> </ol>	CO1, CO3	Analyse	10 <sup>th</sup> July, 25	16 <sup>th</sup> July, 25

	<ul style="list-style-type: none"> <li>Case 2: A startup wants a social media app with changing features.</li> </ul> <p>Q3. A retail company wants to build an e-commerce platform but isn't clear about the full feature set. They want to see working versions quickly and provide feedback in iterations. Which process model would best suit this requirement?</p> <p>Justify your answer with specific features of the model that align with the company's needs.</p> <p>Q4. A software firm is developing a mission-critical medical diagnostics system. The client is very concerned about reliability, safety, and systematic risk analysis at each stage. Which software development model would be most appropriate in this context?</p> <p>Explain why this model is a better fit compared to others.</p>				
2	<p>Q1. Explain the key differences between the Waterfall Model and the Incremental Model with respect to:</p> <ol style="list-style-type: none"> <li>Requirement handling</li> <li>Flexibility</li> <li>Risk management</li> <li>Time to market</li> <li>Customer involvement</li> </ol> <p>Q2. Describe the key principles of Agile methodology.</p> <p>How do they differ from traditional prescriptive process models?</p> <p>Q3. Explain Scrum Model in detail</p>	CO1, CO3	Analyse	17 <sup>th</sup> July, 25	23 <sup>rd</sup> July, 25
3	<p>Q1. Define the following with suitable examples:</p> <ol style="list-style-type: none"> <li>Functional Requirements</li> <li>Non-Functional Requirements</li> <li>Domain Requirements</li> </ol> <p>Q2. A project team is developing an online ticket booking system. During the initial stages, users</p>	CO5, CO6	Apply	24 <sup>th</sup> July, 25	30 <sup>th</sup> July, 25

	<p>only explained what they wanted but did not specify how they expected the system to behave under high traffic or failures.</p> <p>Identify which type of requirements were missed in this case.</p> <p>How could the team have ensured the collection of all necessary requirement types?</p> <p>Q3. What are the key components of a Software Requirement Specification (SRS) document?</p> <p>Explain the importance of each component.</p>				
4	<p>Q1. A company is building a library management system. The development team is struggling with vague requirements from stakeholders and frequent changes in expectations. Which activities of requirement engineering can help in handling this situation? Explain how each activity contributes to refining the requirements.</p> <p>Q2. a) List any four techniques used for requirement gathering.</p> <p>b) A team is developing software for rural healthcare workers who are not tech-savvy. Suggest the most effective requirement elicitation technique and justify your choice.</p>	CO5, CO6	Apply	31 <sup>st</sup> Jul, 25	6 <sup>th</sup> Aug, 25
5	<p>Q1. A college admission form on a website collects student name, email, mobile number, date of birth, and uploads of academic documents. The form must prevent submission if any required information is missing or invalid. Explain how you would implement HTML-based form validation for this form. Mention at least four validation techniques using HTML attributes.</p> <p>Q2. Differentiate between Internal CSS and External CSS with suitable examples. Mention one advantage and one limitation of each.</p> <p>Q3. A web developer needs to create a product catalogue page that displays items in a responsive</p>	CO5, CO6	Apply	7 <sup>th</sup> Aug, 25	13 <sup>th</sup> Aug, 25

	<p>grid layout, with proper spacing and alignment regardless of screen size. Which CSS layout system should be used here? Explain how CSS Grid can be applied to fulfil this requirement.</p> <p>Q4. You are creating an online feedback form using JavaScript. Before submitting the form, you need to check if the user has entered a valid email and selected a rating.</p> <p>Describe how JavaScript DOM and event handling can be used to validate the form input before submission.</p>				
6	<p>Q1. You are leading a team to develop a hospital management system with modules like patient registration, billing, and report generation. Each module has specific deadlines and dependencies. Explain the role of the following in your project scheduling:</p> <ul style="list-style-type: none"> <li>• Task Sets</li> <li>• Task Network</li> <li>• Timeline Chart</li> <li>• Schedule Tracking</li> <li>• Resource Allocation</li> </ul> <p>Q2. A team is managing an e-learning platform project and has broken it down using Work Breakdown Structure (WBS). However, they face difficulties tracking progress and visualizing delays.</p> <p>Suggest appropriate scheduling tools and techniques the team can adopt to improve project tracking. Explain how these tools support timely project delivery.</p>	CO3, CO4	Apply	14 <sup>th</sup> Aug, 25	20 <sup>th</sup> Aug, 25
7.	<p>Q1. A software company is asked to estimate the cost and effort for a payroll processing system. The manager uses the Function Point (FP) technique for estimation, but the client insists on a LOC-based estimate.</p> <p>Compare LOC and FP techniques. Which one</p>	CO3, CO4	Apply	21 <sup>st</sup> Aug, 25	10 <sup>th</sup> Sept, 25

	<p>would be more appropriate in this context and why?</p> <p>Q2. Explain the components of the Management Spectrum in software project management. How does each component influence project success?</p> <p>Q3. Differentiate between Process Metrics and Project Metrics. List two examples of each and explain their significance in project monitoring.</p>				
8.	Poster Presentation on Research Paper			11 <sup>th</sup> Sept, 25	17 <sup>th</sup> Sept, 25
9	MOOC Course of minimum 2 hours based on Software Engineering			18 <sup>th</sup> Sept, 25	24 <sup>th</sup> Sept, 25
10	<p>Q1. List and explain any five fundamental software design concepts. How do they contribute to building a robust and maintainable software system?</p> <p>Q2. Define cohesion and coupling in the context of software design. List different types of each and explain how they impact software maintainability.</p> <p>Q3. What is architectural design in software engineering? Explain any two architectural patterns (e.g., Layered, Client-Server, MVC) with suitable examples.</p> <p>Q4. A development team builds a system where changes in one module frequently affect others. Maintenance becomes difficult and bugs often appear in unrelated modules. Which design issue is likely present in this system? Explain how improving cohesion and reducing coupling can enhance the system's stability.</p>	CO4	Analyse	25 <sup>th</sup> Sept, 25	1 <sup>st</sup> Oct, 25
11	<p>Q1. You are managing a software development project for an e-commerce company. During the risk planning phase, the following risks are identified:</p> <p>1. Server failure — Probability: 0.3, Potential loss: ₹2,00,000</p>	CO4	Analyse	9 <sup>th</sup> Oct, 25	16 <sup>th</sup> Oct, 25



	<p>2. Data breach — Probability: 0.1, Potential loss: ₹10,00,000</p> <p>3. Delay in delivery — Probability: 0.5, Potential loss: ₹1,00,000</p> <p>Answer the following:</p> <p>a) Define risk management and its key steps.</p> <p>b) What is risk exposure, and how is it calculated?</p> <p>c) Calculate the risk exposure for each of the above risks.</p> <p>d) Based on your calculations, which risk should be prioritized for mitigation and why?</p> <p>Q2. Explain the Risk Management process in software engineering.</p> <p>Describe the steps:</p> <ul style="list-style-type: none"> <li>• Risk Identification</li> <li>• Risk Assessment</li> <li>• Risk Projection</li> <li>• Risk Mitigation, Monitoring, and Management (RMMM)</li> </ul> <p>Q3. Explain White Box testing. For the code snippet given below,</p> <p>a) Compute the cyclomatic complexity</p> <p>b) State all the basis paths</p> <pre>int calculate_grade(int marks) {     if (marks &gt;= 90)         return 10;     else if (marks &gt;= 80)         return 9;     else if (marks &gt;= 70)         return 8;     else if (marks &gt;= 60)         return 7;     else if (marks &gt;= 50)         return 6;     else         return 0; }</pre> <p>Q4. A software development team deployed an online shopping portal. During the final testing phase, they noticed frequent crashes under load.</p>				
--	--	--	--	--	--

	<p>The client now questions the product's reliability.</p> <p>What is a baseline in this context?</p> <p>Explain its purpose and importance in software project control, with reference to this scenario.</p>				
--	---	--	--	--	--

### Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		OT	CS	DTP		Textbook	Reference Book	Other Learning Resource	Real Life Assignments	Thought Provoking
1	1			√	2	T1				√
2	2			√	2	T1				√
3	3			√	3	T1				√
4	4			√	3	T1				√
5	5			√	1	T1				√
6	6			√	4	T1				√
7	7			√	4	T1				√
8	8	√	√		5					√
9	9	√	√		6					√
10	10			√	5	T1				√
11	11			√	6	T1				√

\* Tick (√) the Type of the Assignment: Online Tools (OT); Collaborative Assignments (CS); Design /Thought provoking (DTP)

# Write number for textbook, reference book, other learning resource from this AAP – from Points 4.a to 4.d

**8**

### In Semester Assessment (ISA) / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	MSE Question Paper Pattern	Policy
ISA					
Pop Quiz	30th Sept, 2025	All	CO1, CO2, CO3, CO4, CO5, CO6		
Open Book Test					

Take Home Test					
MSE 1		1, 2 and 3	CO1, CO3, CO5, CO6	Q1. Any 2 out of 3 for 5 marks each Q2. Any 1 out of 2 for 10 marks each	
MSE 2		4, 5 and 6	CO3, CO4, CO2	Q1. Any 2 out of 3 for 5 marks each Q2. Any 1 out of 2 for 10 marks each	
Any other test/exams					

\* Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.

## 9. Practical Activities

Practical No.	Module No.	Title of the Experiments	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		
1	1	<p>Project Selection and Conceptualization</p> <p><b>Scenario:</b></p> <p>A student team decides to create a college event management system with features for event registration, schedule viewing, and organizer login.</p> <p><b>Expected Outcome:</b></p> <p>A well-defined project scope including user roles, core modules, and overall functionality is documented.</p>	Y		Deciding modules, functionalities, users and scope of a system	All
2	1	<p>Design the static web pages required for Project: Registration, Login, Home page, Feature1, 2 (based on project)</p> <p><b>Scenario:</b></p> <p>Students develop HTML pages for login, registration, home, and event list for the event management system.</p> <p><b>Expected Outcome:</b></p> <p>Working static pages are created using HTML elements with appropriate structure and tags.</p>	Y		Use of HTML and various tags to develop Static web pages	CO5, CO6
3	1	<p>Write JavaScript to validate the following fields of the Registration page. 1. First Name (Name should contains alphabets and the</p>	Y		Use of JavaScript to validate forms	CO5, CO6

		<p>length should not be less than 6 characters).  2. Password (Password should not be less than 6 characters length). 3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com) 4. Mobile Number (Phone number should contain 10 digits only). 5. Last Name and Address (should not be Empty).</p> <p><b>Scenario:</b>  A user attempts to submit a registration form with an invalid email and a short password.</p> <p><b>Expected Outcome:</b>  The JavaScript code detects invalid entries and displays appropriate alert/error messages before submission</p>				
4	1	<p>Design a web page using CSS (Cascading Style Sheets) which includes the following: Use different font, styles: In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles.</p> <p><b>Scenario:</b>  Students apply various fonts, colors, and layout styles using internal or external CSS.</p> <p><b>Expected Outcome:</b>  The static HTML page displays with the applied styles, demonstrating visual enhancement and formatting</p>	Y		Use of CSS to include various styles of web page	CO5, CO6
5	3	<p>Prepare SRS for Project topic</p> <p><b>Scenario:</b>  Students analyse the requirements of their college event system and document functional and non-functional specifications.</p> <p><b>Expected Outcome:</b></p>	Y		System Requirement Specification work product preparation	CO2

		A well-structured SRS document is produced including use cases, user requirements, constraints, and assumptions.				
6	4	<p>Prepare DFD-Data flow diagram for Project topic.</p> <p><b>Scenario:</b></p> <p>Students create a Level 0 and Level 1 DFD showing data flow for event creation and registration processes.</p> <p><b>Expected Outcome:</b></p> <p>Accurate DFD diagrams are submitted showing processes, data stores, external entities, and data flow arrows.</p>	Y		Data flow diagram to understand the flow of project at various levels	CO3
7	4	<p>Prepare Use case diagram for Project topic</p> <p><b>Scenario:</b></p> <p>Students identify actors like "Student", "Admin", and their interactions with the system.</p> <p><b>Expected Outcome:</b></p> <p>A UML use case diagram showing actors and system interactions with relevant use cases is generated.</p>	Y		Use case diagram to know the actors and the tasks performed by these actor	CO3
8	4	<p>Prepare Sequence Activity diagram for Project topic</p> <p><b>Scenario:</b></p> <p>Students model the sequence of steps in an event registration activity using UML.</p> <p><b>Expected Outcome:</b></p> <p>Clear diagrams illustrating order of operations and flow of actions are produced.</p>	Y		Sequence diagram to know the flow of activities	CO3
9	5	<p>Prepare WBS and Gantt Chart for Project topic</p> <p><b>Scenario:</b></p> <p>Students decompose the project into tasks such as UI design, backend coding, and testing, and create a Gantt chart using any tool like MS Project or online alternatives</p> <p><b>Expected Outcome:</b></p>	Y		Understanding task scheduling	CO5

		A WBS and Gantt chart are submitted showing task hierarchy and timelines for each phase of the project.				
10	6	<p>Prepare Test Case plan for Project topic using Pytest or unittest testing framework</p> <p><b>Scenario:</b></p> <p>Students write Python unit tests to validate the login and registration functionality</p> <p><b>Expected Outcome:</b></p> <p>A test plan with working test cases is implemented; test results (pass/fail) are shown using a test framework.</p>	Y		Understanding Test Case Preparation and performing tests	CO6
11	5	<p>Prepare RMMM Document for Project topic</p> <p><b>Scenario:</b></p> <p>Students list risks like "server failure" or "requirement changes" and propose mitigation plans.</p> <p><b>Expected Outcome:</b></p> <p>A detailed RMMM document is created outlining risk identification, analysis, mitigation, and monitoring strategies.</p>	Y		Understanding Risk Mitigation, Monitoring and Management plan	CO5
12	4	<p>Estimation of Cost for your selected project topic</p> <p><b>Scenario:</b></p> <p>Students estimate the cost of their system based on estimated LOC using the COCOMO model</p> <p><b>Expected Outcome:</b></p> <p>A cost estimation report is generated showing estimated effort, time, and cost based on chosen project size category.</p>	Y		Cost Estimation using COCOMO	CO3
13	6	<p>Problem Statement: Developing a Personal Portfolio Website Using GitHub Pages. Our objective is to create a personal portfolio website using GitHub Pages, showcasing your skills, projects, and experiences. Through this project, you will learn to utilize Git and GitHub</p>	Y		Version Control and Use of Web Development Tools	CO5 and CO6

		<p>for version control, collaborate with others (if in a group), and deploy a static website using GitHub Pages.</p> <p><b>Scenario:</b></p> <p>A student creates a personal portfolio showcasing their projects, resume, and skills and hosts it using GitHub Pages.</p> <p><b>Expected Outcome:</b></p> <p>A live, deployed personal website is available at username.github.io showing all details and version history tracked with Git.</p>				
--	--	---	--	--	--	--

## 10 Uncovering syllabus with different Activities.

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	<b>Experiential learning/Interaction with Outside World</b>	1- Guest Lectures by Industry Expert		Session by Mr. Yogesh on react and other web technologies.
		2- Workshops		
		3- Mini Project		
		4- Industrial Visit		
		5- Any other activity		
2	<b>Collaborative &amp; Group Activity</b>	6- Poster Presentation		Poster Presentation
		7- Minute Papers		
		8- Students Seminars		
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity		Research Paper Writing
3	<b>Co-Curricular Activity</b>	13- Informative videos (NPTEL/YouTube /TEDx/ MIT OW/edX)		NPTEL videos on Testing topic

		14- Lecture Capture Usage		
		15- Any other activity		
4	<b>Tests &amp; Assessments</b>	16- Class Tests/ Weekly Tests		Class Test
		17- Pop Quiz		Pop Quiz
		18- Mobile App Based Quiz		
		19- Open Book Test		
		20- Take Home Test		
		21- Any other activity		

## 11 AAP

No.	Programme	Course	Uploaded on V-refer	Date
1	CMPN	Software Engineering		

## 12 Lecture Guide

No.	Programme	Course	Uploaded on V-refer	Date
1.	CMPN	Software Engineering		

**\* Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Divya Surve	Faculty 2	Faculty 3
External Industry Mentor	External Academic Mentor	Dr. Sachin Bojewar VIT Cluster Mentor
		Dr. Ravindra Sangale Program HOD



## Annexure:

### Assessment Criteria of Learning Outcomes:

<b>Learning Outcomes:</b> The Learner will:	<b>Assessment Criteria:</b> The Learner can:	<b>Evaluated under</b> <b>ISA/MSE/ESE/LAB</b>
LO1 : A learner will be able to design and develop styled, interactive, and modular web pages using HTML, CSS, and JavaScript.	1.1 Recall and apply fundamental HTML tags to construct static web pages.	LAB / ISA
	1.2 Implement CSS using internal, external, and grid layouts to style web content effectively.	LAB / ISA
	1.3 Use JavaScript to create interactive functionality through DOM manipulation.	LAB / ISA
	1.4 Develop modular web pages integrating HTML, CSS, and JavaScript.	LAB / ISA
	1.5 Debug and resolve issues in front-end code implementations.	LAB
LO2 : A learner will be able to understand, analyse, evaluate, and apply various software process models and methodologies for effective project planning and development.	2.1 Define various software process models including prescriptive and agile models.	MSE / ESE
	2.2 Analyse the suitability of different process models for specific software project scenarios.	ISA / ESE
	2.3 Evaluate pros and cons of iterative and incremental methodologies.	ESE / MSE
	2.4 Apply the appropriate process model in planning and managing a software project.	ESE / LAB
LO3 : A learner will be able to define, gather, document, analyse, and refine software requirements using appropriate techniques to create clear and actionable specifications.	3.1 Identify and define functional and non-functional requirements with examples.	ISA / MSE
	3.2 Gather requirements through techniques like interviews, surveys or brainstorming.	ISA
	3.3 Document requirements clearly in a Software Requirements Specification (SRS).	LAB / ISA
	3.4 Analyse and refine ambiguous requirements into detailed, actionable specifications.	MSE / ESE
LO4 : A learner will be able to estimate software projects using models like LOC, FP, and COCOMO; define tasks with WBS; develop and track schedules with charts; and analyse project metrics for progress and completion prediction.	4.1 Explain and apply software estimation models such as LOC, FP and COCOMO.	ISA / ESE
	4.2 Create Work Breakdown Structures (WBS) for software project planning.	LAB / MSE
	4.3 Develop project schedules using Gantt charts or similar tools.	LAB / MSE
	4.4 Analyse project metrics to assess schedule adherence and forecast completion.	MSE / ESE
LO5 : A learner will be able to understand core software design principles, explain interaction design fundamentals for usability, and apply design heuristics and	5.1 Define and explain key software design principles and their importance.	ISA / MSE
	5.2 Describe the fundamentals of interaction design and its role in usability.	ISA

golden rules to create user-centric software designs.	5.3 Apply usability heuristics and golden rules in software interface design.	LAB / ISA
	5.4 Evaluate user interface designs for effectiveness and user experience.	LAB / ESE
LO6 : A learner will be able to explain software testing strategies for quality assurance, identify and manage project risks, describe configuration management processes, and apply risk mitigation and monitoring techniques in software projects.	6.1 Identify and explain different software testing strategies and their purpose.	MSE / ESE
	6.2 Assess software project risks and propose management strategies.	MSE / ESE
	6.3 Explain configuration management including version control and change tracking.	MSE / ESE
	6.4 Apply risk mitigation and monitoring techniques to ensure project success.	ESE / LAB