

## Software Project Management

<b>Course Code</b>	22CS51	<b>Course type</b>	HSMS	<b>Credits L-T-P</b>	3 – 0 - 0
<b>Hours/week: L - T- P</b>	3 – 0 – 0			<b>Total credits</b>	3
<b>Total Contact Hours</b>	L = 40 Hrs; T = 0 Hrs; P = 0 Hrs Total = 40 Hrs			<b>CIE Marks</b>	100
<b>Flipped Classes content</b>	10 Hours			<b>SEE Marks</b>	100

<b>Course learning objectives</b>	
1.	To provide <b>understanding</b> of basic project management principles, including project planning, risk management, and team collaboration.
2.	To <b>apply</b> comprehensive project plans, incorporating project scheduling, resource allocation, and risk management techniques to guide students in meeting specified learning objectives.
3.	To <b>analyze</b> security risk assessments and propose mitigation strategies based on security engineering principles to ensure students understand software system survivability
4.	To <b>evaluate</b> various software testing methodologies such as boundary value analysis and equivalence class testing, and design effective test cases to ensure students understand software quality and reliability.

<b>Pre-requisites:</b> Software Engineering, Engineering mathematics
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<b>Unit – I</b>	<b>Contact Hours = 8 Hours</b>
<b>Project management:</b> Introduction, Risk management, Risk management process, Risk analysis, Risk planning, Risk monitoring, Risk indicators, managing people, motivating people, Teamwork: selecting group members.	

<b>Unit – II</b>	<b>Contact Hours = 8 Hours</b>
<b>Project Planning:</b> Software pricing, Plan-driven Development: Project Plans, Planning process, Project scheduling: Schedule Representation, Agile Planning, Estimation techniques: Algorithmic Cost Modeling, Introduction to The COCOMO II Model. <b>Tools used:</b> Atlassian Jira	

<b>Unit – III</b>	<b>Contact Hours = 8 Hours</b>
<b>Security engineering:</b> Introduction, Security risk management, Life cycle risk analysis, Operational risk assessment, Design of security, System survivability, stages in System survivability.	

<b>Unit – IV</b>	<b>Contact Hours = 8 Hours</b>
<b>Software Testing:</b> A perspective on Testing, Basic definitions, Test cases, Insights from Venn diagram, Identifying Test Cases, Error and fault taxonomy, Levels of Testing. <b>Examples:</b> Generalized pseudocode, The Triangle problem, The Next Date function, The Commission Problem, The SATM (Simple Automatic Teller Machine) system, Saturn Windshield Wiper Controller.	

<b>Unit – V</b>	<b>Contact Hours = 8 Hours</b>
<b>Boundary Value Testing:</b> Boundary Value Analysis, Robustness Testing, Worst Case Testing, Special Value Testing, Examples <b>Equivalence Class Testing:</b> Equivalence classes, Weak Normal Equivalence Class Test, Strong Normal Equivalence Class Test, Weak Robust testing, strong robust testing, Equivalence Class Test Cases examples: Triangle Problem, Next Date Function, Guidelines and Observations.	

#### **Flipped Classroom Details**

<b>Unit No.</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
<b>No. for Flipped Classroom Sessions</b>	2	2	2	2	1

<b>Unit No.</b>	<b>Self-Study Topics</b>
I	Personality types
II	Atlassian Jira tool
III	Stages in System survivability
IV	The currency convertor
V	Guidelines and Observations.

<b>Books</b>	
	<b>Text Books:</b>
1.	Ian Sommerville: Software Engineering, Pearson Education, 9 <sup>th</sup> Edition onwards.
2.	Paul C. Jorgensen: Software Testing, A Craftsman's approach, 3 <sup>rd</sup> Edition, Auerbach Publications, 2008.
	<b>Reference Books:</b>
1.	Aditya P. Mathur: Foundations of Software Testing, Pearson Education, 2008.
2.	Srinivasan Desikan, Gopalaswamy Ramesh, : Software Testing Principles and Practices, 2 <sup>nd</sup> Edition, Pearson Education, 2007.
	<b>E-resources (NPTEL/SWAYAM.. Any Other)-</b>
1.	<a href="https://onlinecourses.nptel.ac.in/noc22_cs61/preview">https://onlinecourses.nptel.ac.in/noc22_cs61/preview</a>
2.	<a href="https://onlinecourses.nptel.ac.in/noc24_mg01/preview">https://onlinecourses.nptel.ac.in/noc24_mg01/preview</a>

<b>Course delivery methods</b>		<b>Assessment methods</b>	
1.	Chalk and Talk	1.	IA tests
2.	PPT and Videos	2.	Open Assignment (OA)/ Certification
3.	Flipped Classes	3.	Course Project
4.	Online classes	4.	Semester End Examination

Course Outcome (COs)				
At the end of the course, the student will be able to (Highlight the <b>action verb</b> representing the learning level.)				
Learning Levels: Re - Remember; Un - Understand; Ap - <b>Apply</b> ; An - <b>Analysis</b> ; Ev - <b>Evaluate</b> ; Cr - <b>Create</b>		Learning Level	PO(s)	PSO(s)
1.	Demonstrate <b>understanding</b> of project management, including project planning, risk management, and teamwork.	Un	1,6,8,9,11	2
2.	<b>Apply</b> project planning techniques to create effective project plans with clear objectives, schedules, and resource allocation.	Ap	2, 3, 4, 5,6, 8,9	1,2
3.	<b>Analyze</b> security risks and propose mitigation strategies to ensure system survivability.	An	2,4, 6, 8,12	1,2
4.	<b>Evaluate</b> software testing methodologies, such as boundary value analysis and equivalence class testing, to design effective test cases for quality assurance.	Ev	2,3,4	2
5	<b>Demonstrate</b> effective team collaboration and communication skills to complete project-related tasks.	Ap	8, 9,10,11,12	3

#### Scheme of Continuous Internal Evaluation (CIE):

Components	Addition of two IA tests	Two Assignments – (Open /Industry/Certification etc)	Course project (CP)/ Case study etc	Total Marks
Marks	30+30 = 60	10 + 10 = 20	20 marks (with report & presentation)	100
<p>-Certification earned by passing the standard Online MOOCs course (1 course of atleast 8 hours defined by BOS) can be considered as a Course activity and awarded maximum of 10 marks.</p> <p>-Student should score minimum 40% of 60 marks (i.e. 24 marks) in IA tests.</p> <p>-Lack of minimum score in IA test will make the student Not Eligible for SEE</p> <p>-Minimum score in CIE to be eligible for SEE: 40 OUT OF 100.</p>				

#### Scheme of Semester End Examination (SEE):

1.	It will be conducted for 100 marks of 3 hours duration.
2.	<b>Minimum marks required in SEE to pass:</b> Score should be $\geq 35\%$ , however overall score of CIE + SEE should be $\geq 40\%$ .
3.	Question paper contains three parts <b>A,B and C</b> . Students have to answer 1. From Part A answer any 5 out of 7 questions, each Question Carries 6 Marks. 2. From Part B answer 5 out of 10 questions choosing any one full question from each unit, each Question Carries 10 Marks. 3. From Part C answer 1 out of 2 questions, each Question Carries 20 Marks.

CO-PO Mapping (Planned)													CO-PSO Mapping (Planned)		
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO1	PSO2	PSO3
1	✓					✓		✓	✓		✓			✓	
2		✓	✓	✓	✓	✓		✓	✓				✓	✓	
3		✓		✓		✓		✓				✓	✓	✓	
4		✓	✓	✓					✓					✓	
5								✓	✓	✓	✓	✓	✓		✓

Tick mark the CO, PO and PSO mapping

SI No	Skill & competence enhanced after undergoing the course	Applicable Industry Sectors & domains	Job roles students can take up after undergoing the course
1	Software Design	IT Sector, Banking, Finance, Health Care	Software Engineers
2	Software Project Management Tools		Project Manager
3	Software Testing Tools		Quality Assurance Engineer

