Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
CSE320	SOFTWARE ENGINEERING	3	0	0	3	
Course Weightage	ATT: 5 CA: 25 MTT: 20 ETT: 50					

Course Focus	SKILL DEVELOPMENT

Course Outcomes :Through this course students should be able to

CO1 :: recall various software development life cycle models and write software requirement specifications

CO2 :: construct software design from requirement specifications by following a structured and organized process

CO3 :: apply the constructs of unified modelling language for object modelling

CO4 :: analyze and explain fundamentals of testing, levels of testing and various types of testing techniques

CO5 :: assess project progress using project management techniques

CO6 :: examine various software quality standards and the current trends in the area of software engineering

	TextBooks (T)		
Sr No	**Title**	**Author**	**Publisher Name**
T-1	FUNDAMENTALS OF SOFTWARE ENGINEERING	RAJIB MALL	PRENTICE HALL

	Reference Books (R)		
Sr No	**Title**	**Author**	**Publisher Name**
R-1	SOFTWARE ENGINEERING	IAN SOMMERVILLE	PEARSON
R-2	SOFTWARE ENGINEERING:A PRACTITIONER APPROACH	ROGER S.PRESSMAN	MCGRAW HILL EDUCATION
R-3	SOFTWARE ENGINEERING FUNDAMENTALS	ALI BEHFOROOZ AND FREDERICKS J. HUDSON	OXFORD UNIVERSITY PRESS

Other Reading (OR)	
Sr No	**Journals articles as Compulsary reading (specific articles, complete reference)**
OR-1	http://link.springer.com/journal/volumesAndIssues/40411 ,
OR-2	http://dl.acm.org/citation.cfm?id=776925 ,

Relevant Websites (RW)		
Sr No	**(Web address) (only if relevant to the course)**	**Salient Features**
RW-1	https://www.seleniumhq.org/docs/01_introducing_selenium.jsp#introducing-selenium	Selenium data
RW-2	http://nptel.ac.in/courses/106105087/	Lecture Notes by Prof. Rajib Mall
RW-3	http://editorial.co.in/software/software-testing-life-cycle.php	Software testing
RW-4	http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-170-software-studio-spring-2013/lecture-notes/	Software development methods
RW-5	http://agilemethodology.org/	Agile methodology
RW-6	http://docs.jboss.org/aop/1.0/aspect-framework/userguide/en/html/what.html	AOP
RW-7	http://www.extremeprogramming.org/	Extreme Programming

Audio Visual Aids (AV)		
Sr No	**(AV aids) (only if relevant to the course)**	**Salient Features**
AV-1	http://nptel.ac.in/video.php?subjectId=106101061	Online Video Lectures, from IIT Mumbai
AV-2	http://scrumtrainingseries.com/Intro_to_Scrum/	Introduction to Scrum

Virtual Labs (VL)		
Sr No	**(VL) (only if relevant to the course)**	**Salient Features**
VL-1	http://vlabs.iitkgp.ac.in/se/	To keep this trend as well as the pace with the rapid advancement of software technologies the "Software Engineering Virtual Lab" has been developed

LTP week distribution: (LTP Weeks)	
Weeks before MTE	7
Weeks After MTE	7
Spill Over (Lecture)	

Detailed Plan For Lectures

Week Number	Lecture Number	Broad Topic(Sub Topic)	Chapters/Sections of Text/reference books	Other Readings, Relevant Websites, Audio Visual Aids, software and Virtual Labs	Lecture Description	Learning Outcomes	Pedagogical Tool Demonstration/ Case Study / Images / animation / ppt etc. Planned	Live Examples

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Week 1	Lecture 1	Introduction to software engineering(Evolution and impact of software engineering)	R-2	RW-2	Lecture Zero, Course overview, content, its background and importance	Students get the overview of course, its content and importance of software engineering in projects.	Lecture cum demonstration	
	Lecture 2	Introduction to software engineering(Software life cycle models)	T-1 R-2	AV-1	Software engineering concepts, Discussing the Crisis, myths of software engineering, Software process models need and waterfall model	Students will learn the foundation of software development models i.e., waterfall model.	Lecture cum demonstration	
		Introduction to software engineering(Waterfall model)	T-1 R-2	AV-1	Software engineering concepts, Discussing the Crisis, myths of software engineering, Software process models need and waterfall model	Students will learn the foundation of software development models i.e., waterfall model.	Lecture cum demonstration	
	Lecture 3	Introduction to software engineering(Prototyping model)	T-1 R-2	AV-1	Prototype model for development	Students will learn the importance of toy implementation of a software i.e., instead of developing the software directly one must develop a prototype first.	Lecture cum demonstration	Gather requirements for complex projects. (http://m.melodiacristiana.com/video/-rNb7nT4NMU/)
Week 2	Lecture 4	Introduction to software engineering(Evolution and spiral models)	T-1 R-1		Evolutionary and spiral model	Studentss will learn to apply the best fit SDLC models for different scenarios i.e., in case of large projects and to handle risks, use evolutionary and spiral model respectively.	Lecture cum demonstration	For windows operating system for different versions.
	Lecture 5	Introduction to software engineering(Feasibility study)	T-1 R-2	AV-1	Describe about the feasibility issues and requirement gathering concept of software	Students will learn about the feasibility study,its related issues and requirement gathering concept of software	Case study	Feasibility and requirement for house construction

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Week 2	Lecture 5	Introduction to software engineering(Requirement gathering)	T-1 R-2	AV-1	Describe about the feasibility issues and requirement gathering concept of software	Students will learn about the feasibility study,its related issues and requirement gathering concept of software	Case study	Feasibility and requirement for house construction
	Lecture 6	Introduction to software engineering(Functional and non-functional requirements)	T-1 R-1	VL-1	Describe the different types of requirements	Students will learn how to gather requirement as per different categories	Lecture cum demonstration	Example of ATM machine and need to discuss both functional and nonfunctional requirements
Week 3	Lecture 7	Introduction to software engineering(Requirement analysis and specification)	T-1 R-3		Describe the analysis strategies for requirements	Students will learn analysis and drafting in the form of document	Case study	Case Study: A system (like UMS, Flipkart etc) will be assigned to each student in the beginning of the term and students will write complete SRS, do system design and write test cases for the assigned system
	Lecture 8	Issues in software design (Basic issues in software design)	T-1 R-3	RW-4 AV-1	Describe the software designing concepts	Students will learn how to analyse requirement and drafting in the form of design document close to implementation.	Lecture cum demonstration	Example for software project like UMS any module can be elaborated
	Lecture 9	Issues in software design (Modularity)	T-1 R-1 R-3		Describe about the modularity approaches	Students will be able to define module structure	Lecture cum demonstration	Modules for library management system

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Week 4	Lecture 10	Issues in software design (Cohesion)	T-1 R-2	RW-2	Describe the concept of cohesion	Students will learn about the various types of cohesion like functional, procedural, temporal etc	Lecture cum demonstration	Take example of Module to show cohesion
	Lecture 11	Issues in software design (Coupling and layering)	T-1 R-2	AV-1	Describe the concept of coupling	Students will learn about various types of coupling like data, control, common, stamp coupling.	Lecture cum demonstration	Structural representation can be used as live example to show coupling
	Lecture 12	Issues in software design (Function oriented software design)	T-1 R-3	AV-1	Describe about the technique of function oriented design	Students will learn about the designing techniques	Lecture cum demonstration	Application comprise of various independent functionality.
Week 5	Lecture 13	Issues in software design (Data flow diagram and structure chart)	T-1 R-1 R-2	OR-1 VL-1	Describe data flow diagram and structure chart	Students will learn about data flow diagram(DFD), various DFD levels, structure chart	Case study	Live demonstration: Live demonstrations on UML
	Lecture 14	Object modelling(User interface design)	T-1 R-2	RW-2 RW-4	Description of user interface design	Students will learn concept of software design and good user interface	Lecture cum demonstration	About the UI of any software projects, Take the ATM machine interface for discussion
	Lecture 15	Object modelling(Object modelling using UML)	T-1 R-2	AV-1	Description of unified modelling language	Students will learn UML diagram for structural and behavioral representation of system	Case study	ATM can be discussed as live example
Week 6	Lecture 16	Object modelling(use case model development)	T-1	AV-1	Describe Object oriented development concept with use case modelling	Students will learn about gathering requirements in the form of diagrammatic representation	Lecture cum demonstration	

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Week 6	Lecture 17	Object modelling(unified process)	T-1	AV-1	Describe unified process of creating object oriented systems.	Students will learn about unified processes and its phases i.e., inception, elaboration, construction and transition.	Lecture cum demonstration	
	Lecture 18				Test 1			
Week 7	Lecture 19	Object modelling(Coding standards and code review techniques)	T-1 R-3	RW-2	Describe about code review and guidelines. CASE Study Pre-Submission.	Students will learn code review techniques i.e., code inspections and code walkthroughs.	Lecture cum demonstration	Writing code in one of the programming languages such as C, C++ or Java; we follow specific syntax and standards
		SPILL OVER						
Week 7	Lecture 21				Spill Over			
		MID-TERM						
Week 8	Lecture 22	Testing(Fundamentals of testing)	T-1 R-2 R-3	RW-3	Describe fundamentals of software testing	Student will able to understand the significance of testing in the process of software development	Lecture cum demonstration	
	Lecture 23	Testing(Levels of testing)	T-1	RW-2 AV-1	Describe various levels of testing	Students will learn about various testing levels and the area in which it can be applied.	Lecture cum demonstration	
	Lecture 24	Testing(Black box testing techniques)	T-1	RW-2 AV-1	Describe functional testing its types viz., equivalence class partitioning and special value testing.	Students will be able to learn various black box testing strategies.	Lecture cum demonstration	
		Testing(Test cases)	T-1	RW-2 AV-1	Describe functional testing its types viz., equivalence class partitioning and special value testing.	Students will be able to learn various black box testing strategies.	Lecture cum demonstration	

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Week 9	Lecture 25	Testing(White box testing techniques)	T-1	RW-2 AV-1	L25: Describe structural testing. L26: Describe various types of structural testing viz., coverage and fault based	Students will learn about various white box testing strategies.	Lecture cum demonstration	
	Lecture 26	Testing(White box testing techniques)	T-1	RW-2 AV-1	L25: Describe structural testing. L26: Describe various types of structural testing viz., coverage and fault based	Students will learn about various white box testing strategies.	Lecture cum demonstration	
	Lecture 27				Test 2			
Week 10	Lecture 28	Introduction to selenium (Feature of selenium)		RW-1	Describe feature, versions and record and play back for any web application.	Students will learn the feature, different versions. L28: Students will understand the record and play back for web application.	Lecture cum demonstration	
		Introduction to selenium (Versions of selenium)		RW-1	Describe feature, versions and record and play back for any web application.	Students will learn the feature, different versions. L28: Students will understand the record and play back for web application.	Lecture cum demonstration	
		Introduction to selenium (Record and play back)		RW-1	Describe feature, versions and record and play back for any web application.	Students will learn the feature, different versions. L28: Students will understand the record and play back for web application.	Lecture cum demonstration	
	Lecture 29	Software project management(Project managment)	T-1 R-1	AV-1	L29: Describe the task, Assignment of duration against the task L30: Assignment of the resources (about the skills necessary for project management, concepts of project planning and control)	Student will know how to manage the project, task assignment, monitoring and control	Lecture cum demonstration	

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Week 10	Lecture 29	Software project management(Project planning and control)	T-1 R-1	AV-1	L29: Describe the task, Assignment of duration against the task L30: Assignment of the resources (about the skills necessary for project management, concepts of project planning and control)	Student will know how to manage the project, task assignment, monitoring and control	Lecture cum demonstration	
	Lecture 30	Software project management(Project managment)	T-1 R-1	AV-1	L29: Describe the task, Assignment of duration against the task L30: Assignment of the resources (about the skills necessary for project management, concepts of project planning and control)	Student will know how to manage the project, task assignment, monitoring and control	Lecture cum demonstration	
		Software project management(Project planning and control)	T-1 R-1	AV-1	L29: Describe the task, Assignment of duration against the task L30: Assignment of the resources (about the skills necessary for project management, concepts of project planning and control)	Student will know how to manage the project, task assignment, monitoring and control	Lecture cum demonstration	
Week 11	Lecture 31	Software project management(Cost estimation)	T-1 R-3	AV-1	Describe about various techniques of cost estimation	Student will learn Project estimation techniques, LOC, COCOMO Model, Halsteads metrics	Lecture cum demonstration	
	Lecture 32	Software project management(Project scheduling using PERT and GANTT charts)	T-1	AV-1	Describes the concept of project scheduling	Student will able to schedule projects and learn PERT and GANTT charts	Live demonstration	Use MS project to show the scheduling with PERT chart live preparation.
	Lecture 33	Software project management(Software configuration management)	T-1		Describe about software configuration management	Students will learn about basics of SCM, configuration items, saving a baseline	Lecture cum demonstration	
Week 12	Lecture 34				Assignment - Case based			

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Week 12	Lecture 35	Quality management (Quality management)	T-1 R-3	RW-2	Describe about quality management and its paradigm shift.	Students will learn about quality assurance, Quality control and TQM.	Lecture cum demonstration	
	Lecture 36	Quality management(ISO and SEI CMMI)	T-1 R-2		Describe about the ISO and CMMI	Students will learn about the ISO i.e., International Organisation for Standardisation, how to apply for it, its requirements list and CMM i.e., capability maturity model.	Lecture cum demonstration	Give example of any industry having ISO or CMM standard. As IBM is CMM level 5 industry.
Week 13	Lecture 37	Quality management(PSP and six sigma)	T-1 R-2		Describe about the PSP and Six sigma	Students will learn about Personal Software Process i.e., scaled down version of PSP and how an organisation can apply six sigma.	Lecture cum demonstration	
	Lecture 38	Quality management (Computer aided software engineering)	T-1	AV-1	Describe about Computer Aided Software Engineering.	Student will learn varoious CASE tools.	Lecture cum demonstration	
		Quality management (Software maintenance)	T-1	AV-1	Describe software maintenance	Student will learn categories of software maintenance and its laws.	Lecture cum demonstration	
	Lecture 39	Quality management (Software reuse)	T-1	AV-1	Describe about Computer Based Software Development and software reuse.	Student will learn the concept of software reuse, CORBA, COM, DCOM.	Lecture cum demonstration	
		Quality management (Component based software development)	T-1	AV-1	Describe about Computer Based Software Development and software reuse.	Student will learn the concept of software reuse, CORBA, COM, DCOM.	Lecture cum demonstration	

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Week 14	Lecture 40	Advance techniques of software engineering(Agile development methodology)	R-1	OR-2 RW-5 RW-6 RW-7 AV-2 AV-1	Current technology in software engineering	Student get an awareness about the current technology used in industry i.e., Agiles methadologies (Scrum, xP, FDD, ASD etc)	Lecture cum demonstration	
		Advance techniques of software engineering (Scrum)	R-1	OR-2 RW-5 RW-6 RW-7 AV-2 AV-1	Current technology in software engineering	Student get an awareness about the current technology used in industry i.e., Agiles methadologies (Scrum, xP, FDD, ASD etc)	Lecture cum demonstration	
		Advance techniques of software engineering(Aspect oriented programming)	R-1	OR-2 RW-5 RW-6 RW-7 AV-2 AV-1	Current technology in software engineering	Student get an awareness about the current technology used in industry i.e., Agiles methadologies (Scrum, xP, FDD, ASD etc)	Lecture cum demonstration	
		Advance techniques of software engineering (Extreme Programming)	R-1	OR-2 RW-5 RW-6 RW-7 AV-2 AV-1	Current technology in software engineering	Student get an awareness about the current technology used in industry i.e., Agiles methadologies (Scrum, xP, FDD, ASD etc)	Lecture cum demonstration	
		Advance techniques of software engineering (Adaptive software development)	R-1	OR-2 RW-5 RW-6 RW-7 AV-2 AV-1	Current technology in software engineering	Student get an awareness about the current technology used in industry i.e., Agiles methadologies (Scrum, xP, FDD, ASD etc)	Lecture cum demonstration	
		Advance techniques of software engineering(Rapid application development (RAD))	R-1	OR-2 RW-5 RW-6 RW-7 AV-2 AV-1	Current technology in software engineering	Student get an awareness about the current technology used in industry i.e., Agiles methadologies (Scrum, xP, FDD, ASD etc)	Lecture cum demonstration	

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Week 14	Lecture 40	Advance techniques of software engineering (Software coloning)	R-1	OR-2 RW-5 RW-6 RW-7 AV-2 AV-1	Current technology in software engineering	Student get an awareness about the current technology used in industry i.e., Agiles methadologies (Scrum, xP, FDD, ASD etc)	Lecture cum demonstration	
		SPILL OVER						
Week 14	Lecture 42				Spill Over			
Week 15	Lecture 43				Spill Over			
	Lecture 44				Spill Over			
	Lecture 45				Spill Over			

Scheme for CA:

CA Category of this Course Code is:C010102 (Total 3 tasks, 1 compulsory and out of remaining 1 best out of 2 to be considered)

Component	Iscompulsory	Weightage (%)	Mapped CO(s)
Assignment - Case based	Yes	50	CO1, CO2, CO3, CO4, CO5, CO6
Test 1	NO	50	CO1, CO2
Test 2	NO	50	CO3, CO4, CO5

Details of Academic Task(s)

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
Assignment - Case based	To evaluate the student through case study	Case study based on topic assigned on the basis of written SRS30%, System design-30% , Test cases-20% and viva 20 % .	Individual	Online	30	2 / 12
Test 1	To evaluate the student through MCQ Based test	Topics covered from week 1 to week 4 for test. Lifecycle models:10 Marks, SRS:10 marks, DFDs:10 marks	Individual	Online	30	5 / 6
Test 2	To evaluate the student through written tes	Topics covered from week 5 to week 8 for test	Individual	Online	30	9 / 10

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MOOCs/ Certification etc. mapped with the Academic Task(s)

Academic Task	Name Of Certification/Online Course/Test/Competition mapped	Type	Offered By Organisation
Test 1	SOFTWARE ENGINEERING	MOOCs	NPTEL

Where MOOCs/ Certification etc. are mapped with Academic Tasks:
1. Students have choice to appear for Academic Task or MOOCs etc.
2. The student may appear for both, In this case best obtained marks will be considered.