

DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE (AUTONOMOUS)



(Approved by AICTE & Affiliated to Anna University, Chennai)
Accredited with 'A' Grade by NAAC, Accredited by TCS
Accredited by NBA with BME, ECE & EEE
PERAMBALUR - 621 212. Tamil Nadu.
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COURSE PLAN (2024 – 2025 Odd Semester)

Name of the Faculty	Mrs.Preethi. S			
Designation/Department	ASSISTANT PROFESSOR / IT			
Course Code/Name	U20IT502 / SOFTWARE ENGINEERING			
Year/Section/Department	III / C/IT			
Credits Details	L:3	T:0	P:0	C:3
Total Contact Hours Required	45			

Syllabus:

UNIT I SOFTWARE PROCESS	No. of Periods 9
Introduction –Software Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented and Agile software project management model) – system engineering – computer based system – verification – validation.	
UNIT II SOFTWARE REQUIREMENTS	No. of Periods 9
Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -Software document. Analysis and modeling- data, functional and behavioral models – structured analysis and data dictionary.	
UNIT III DESIGN CONCEPTS AND PRINCIPLES	No. of Periods 9
Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design– user interface design – user interface design principles. Real time systems - Real time software design. Software Configuration Management (SCM) – Need for SCM – Version control – Introduction to SCM process – Software configuration items - software design with extreme programming – Risk Management.	
UNIT IV TESTING	No. of Periods 9
Taxonomy of software testing – levels – test activities – types of software test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large - software testing strategies - testing using extreme programming.	

UNIT V SOFTWARE PROJECT MANAGEMENT	No. of Periods 9
Measures and measurements – S/W complexity and science measure – size measure – data and logic Structure measure – information flow measure. Software cost estimation – function point models COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis Error Tracking – Software changes – program evolution dynamics – software maintenance Architectural evolution.	

Objective:

- To understand the phases in a software project
- To understand fundamental concepts of requirements engineering and Analysis Modeling.
- To understand the various software design methodologies
- To learn various testing and maintenance measures

Text Book:

- T1:** Roger S. Pressman, “Software Engineering – A Practitioner’s Approach”, Seventh Edition, McGraw-Hill International Edition, 2010.
- T2:** Ian Sommerville, ”Software Engineering”, 9th Edition, Pearson Education Asia, 2011.

Reference Book:

- R1.** Rajib Mall, Fundamentals of Software Engineering”, Third Edition, PHI Learning Private Limited, 2009.
- R2.** Pankaj Jalote, —Software Engineering, A Precise Approach, Wiley India, 2010.
- R3.** Kelkar S.A., —Software Engineering, Prentice Hall of India Pvt Ltd, 2007.
- R4.** Stephen R.Schach, —Software Engineering, Tata McGraw-Hill Publishing Company Limited, 2007.

Website:

- W1:** <http://nptel.ac.in/>.
- W2:** https://www2.cs.siu.edu/~mengxia/Courses%20PPT/435/Chapter_03.pdf
- W3:** <http://www.cs.tau.ac.il/~nachumd/models/Nets.pdf>

Online Mode of Study (if Any):

- <https://nptel.ac.in/courses/106/105/106105182/>
- https://onlinecourses.nptel.ac.in/noc20_cs68/preview

Course Plan:

Topic Number	Topic	Reference Detail	Page Number	Mode of teaching	Number of Periods Required	Cumulative Period
UNIT I - SOFTWARE PROCESS						
1	Introduction to Software Engineering	T1	20	BB	1	1
2	Software Engineering Paradigm	T1	23	BB	1	2
3	Life cycle models - Waterfall, Incremental Process Models	T1	26	BB	1	3
4	WINWIN spiral, evolutionary model	T1	34	PPT & Video	1	4
5	Prototyping & object oriented model	T1	43	BB	1	5
6	Agile software project management model	T1	56	BB	1	6
7	System engineering	T1	65	BB	1	7
8	Computer based system	W2	---	BB	1	8
9	Verification , validation	W2	---	BB	1	9
Outcome of Unit I:						
CO1: Identify the key activities in managing a software project and recognize different process model.(K2)						
UNIT II - SOFTWARE REQUIREMENTS						
10	Software Requirements: Functional and Non-Functional	T1	272	BB	1	10
11	User requirements, System requirements	T1	273	PPT	1	11
12	Requirement Engineering Process: Feasibility Studies	T1	274	BB	1	12

13	Requirements elicitation and analysis	T1	256	BB	1	13
14	Requirement validation, requirements management	T1	258	BB	1	14
15	Software prototyping, prototyping in the software process, rapid prototyping techniques	T1	260	BB	1	15
16	User interface prototyping, Software document	T1	330	BB	1	16
17	Analysis and modeling- data, functional and behavioral models	W3	---	BB	1	17
18	Structured analysis and Data Dictionary	R1	428	BB	1	18

Outcome of Unit II:

CO2: Explain the concepts of requirements engineering and Analysis Modeling.(K2)

UNIT III - DESIGN CONCEPTS AND PRINCIPLES

19	Design process – Design Concepts	T1	338	BB	1	19
20	Design Model– Design Heuristic	T1	355	BB	1	20
21	Architectural Design	T1	365	BB	1	21
22	User interface design	T1	371	BB	1	22
23	Real time systems	T1	378	BB	1	23
24	Software Configuration Management (SCM)	R2	211	BB	1	24

25	Version control – Introduction to SCM process	R2	222	BB	1	25
26	Software design with extreme programming	T1	415	BB	1	26
27	Risk Management.	T1	416	BB	1	27

Outcome of Unit III:**CO3:** Outline the systematic procedures for software design and deployment.(K2)**UNIT IV - TESTING**

28	Taxonomy of software testing	T1	438	BB	1	28
29	Levels – test activities	T1	439	BB	1	29
30	Types of software test	T1	444	BB	1	30
31	Black box testing	T1	459	PPT	1	31
32	Testing boundary conditions – structural testing	T1	488	BB	1	32
33	Test coverage criteria based on data flow mechanisms	W1	---	BB	1	33
34	Regression testing	T1	657	BB	1	34
35	Software testing strategies	T1	802	BB	1	35
36	Testing using extreme programming	T1	809	BB	1	36

Outcome of Unit IV:**CO4:** Compare various testing and maintenance methods.(K2)**UNIT V - SOFTWARE PROJECT MANAGEMENT**

37	Measures and measurements	W2	---	PPT	1	37
38	Size measure – data and logicStructure measure	W2	---	PPT	1	38
39	Information flow measure	T1	133	BB	1	39

40	Software cost estimation – function point models	T1	181	BB	1	40
41	COCOMO model- Delphi method	T1	186	BB	1	41
42	Defining a Task Network – Scheduling	T1	148	BB	1	42
43	Earned Value Analysis	T1	151	BB	1	43
44	Software changes – program evolution dynamics	T1	159	BB	1	44
45	Software maintenance Architectural evolution.	T1	828	BB	1	45

Outcome of Unit V:

CO5: Interpret the project schedule, estimate project cost and effort required.(K2)

CO6: Develop a software using the software engineering principles.(K2)

Course Outcome:**At the end of course:**

CO1: Identify the key activities in managing a software project and recognize different process model.(K2)

CO2: Explain the concepts of requirements engineering and Analysis Modeling.(K2)

CO3: Outline the systematic procedures for software design and deployment.(K2)

CO4: Compare various testing and maintenance methods.(K2)

CO5: Interpret the project schedule, estimate project cost and effort required.(K2)

CO6: Develop a software using the software engineering principles.(K2)

Course Outcome Vs Program Outcome Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	-	-	-	-	-	-	-	-	-	-
CO 2	2	1	-	-	-	-	-	-	-	-	-	-
CO 3	2	1	-	-	-	-	-	-	-	-	-	-
CO 4	2	1	-	-	-	-	-	-	-	-	-	-
CO 5	2	1	-	-	-	-	-	-	-	-	-	-
CO 6	3	2	1	1	-	-	-	-	-	-	-	-
AVG	2.17	1.17	1	1	-	-	-	-	-	-	-	-

Content Beyond Syllabus / Gap Identified:

- Software Quality factors
- Capability Maturity Model
- Glass-Box Testing
- SPI models

Assignment:

Web Portal	Assignment	Components	Topic Number with Topic/Unit Details	Relevance to CO
Web Portal 1	--	Assessment – I (60)	Unit I and II	CO1 & CO2
	1	Assignment-Handwritten (20)	3.Waterfall model, Incremental model 4.Spiral model, Evolutionary model,	CO 1
	2	Poster/PPT Presentation (20)	5.Prototyping model, 12.Requirement engineering process	CO 2
Web Portal 2	--	Assessment – II (60)	Unit III and IV	CO3 & CO4
	3	Seminar (20)	17.functional and behavioral models 18.Structured analysis and Data Dictionary	CO 3
	4	Case Study Report/ Mini	31. Black box testing 34. Regression testing	CO 4

		Project/ Model Making (20)		
Web Portal 3	--	Model Exam (75)	Unit V	CO1 to CO6
	5	Technical Aptitude (15)	41. COCOMO model 43. Earned Value Analysis	CO 5 & CO 6
		Attendance (Course attendance-10)		

Submission Details:

Phase 1(Before AT 1)		Phase 2 (Before AT 2)		Phase 3 (Model)
Assignment 1	Assignment 2	Assignment 3	Assignment 4	Assignment 5

PLAN OF ASSESSMENT TEST –DISTRIBUTION OF MARKS:

TEST	CO- MARK WISE DISTRIBUTION						BLOOM'S LEVEL MARK WISE DISTRIBUTION					
	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
AT-1	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
	39	21	-	-	-	-	20	40	-	-	-	-
AT-2	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
	-	-	39	21	-	-	-	-	-	-	-	-
MODEL	CO1	CO2	CO3	CO4	CO5	CO6	BTL1	BTL2	BTL3	BTL4	BTL5	BTL6
	20	20	20	20	10	10	-	-	-	-	-	-

Google Class Code Details:

Google Class Name: **U20IT502 SOFTWARE ENGINEERING**

Google Class Code:

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