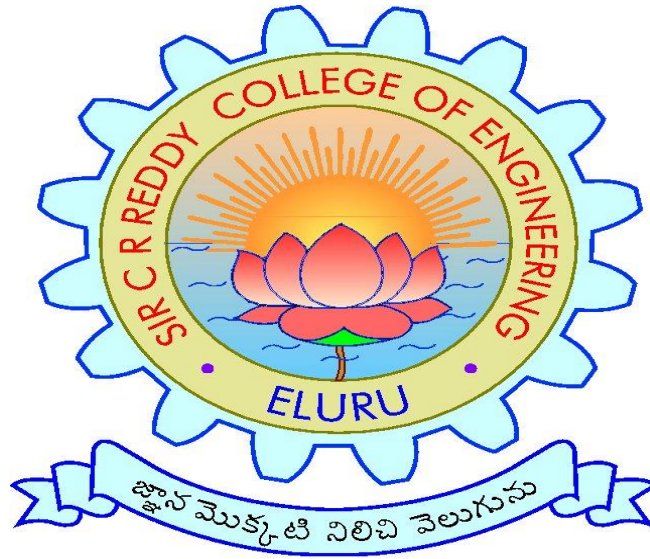


SIR C.R.REDDY COLLEGE OF ENGINEERING, ELURU

DEPARTMENT OF INFORMATION TECHNOLOGY

LESSON PLAN



SUBJECT: R1621121 SOFTWARE ENGINEERING

CLASS: II/IV B.Tech, I SEMESTER, A.Y.2019-20

INSTRUCTOR: J.MALATHI

SIR C.R.REDDY COLLEGE OF ENGINEERING, ELURU

DEPARTMENT OF INFORMATION TECHNOLOGY

Programme: B.Tech

Semester: II/IV 1st Semester

Academic Year: 2019-20

Course: IT R1621121 SOFTWARE ENGINEERING

Instructor: J.MALATHI

Course Contents

Category of Course	Course Title	Course Code	Credits- 4	Theory Paper
Departmental R1621121	SOFTWARE ENGINEERING	R1621121	L-3 T-1	Max.Marks-70 Duration-3hrs.

Course description:

Software Engineering (SE) comprises the core principles software processes and life-cycles, requirements analysis, software engineering methodologies and standard notations, principles of software architecture and re-use, testing the software using different methods and also different maintenance process models .

Course objectives:

- 1) Understand the Software life cycle models.
- 2) Understand the Software requirements and SRS document.
- 3) Design and develop correct and robust software products.
- 4) Understand the planning and estimation of software projects.
- 5) Understand the implementation issues, validation and verification procedures.

6) Understand the maintenance of software.

Course Outcomes:

On completing this course student will be able to

1. Obtain knowledge about principles and practices of software engineering and learn the basics of the life cycle of software.
2. Prepare an SRS document and Apply the fundamentals concepts of design for modeling a software project.
3. Analyze the requirements of a software development project and perform validations during testing.
4. Define and develop a software project from requirement gathering to implementation, maintenance and reuse of software systems.

Online References:

1. https://en.wikipedia.org/wiki/Software_engineering
2. https://www.tutorialspoint.com/software_engineering/
3. <https://www.geeksforgeeks.org/software-engineering/>
4. <https://www.guru99.com/software-engineering-tutorial.html>

Prerequisite:

Students are expected to possess the sophomore level skills.

SOFTWARE ENGINEERING SYLLABUS

UNIT-I:

Software and Software Engineering: The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software Myths.

Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.

UNIT-II:

Requirements Analysis And Specification: Requirements Gathering and Analysis, Software Requirement Specification (SRS), Formal System Specification.

Software Design: Overview of the Design Process, How to Characterise of a Design?, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design

UNIT – III:

Function-Oriented Software Design: Overview of SA/SD Methodology, Structured Analysis, Developing the DFD Model of a System, Structured Design, Detailed Design, Design Review, over view of Object Oriented design.

User Interface Design: Characteristics of Good User Interface, Basic Concepts, Types of User Interfaces, Fundamentals of Component-based GUI Development, A User Interface Design Methodology.

UNIT – IV:

Coding And Testing: Coding, Code Review, Software Documentation, Testing, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tool, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing

UNIT – V:

Software Reliability And Quality Management: Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model.

Computer Aided Software Engineering: Case and its Scope, Case Environment, Case Support in Software Life Cycle, Other Characteristics of Case Tools, Towards Second Generation CASE Tool, Architecture of a Case Environment

UNIT – VI

Software Maintenance: Software maintenance, Maintenance Process Models, Maintenance Cost, Software Configuration Management.

Software Reuse: what can be Reused? Why almost No Reuse So Far? Basic Issues in Reuse Approach, Reuse at Organization Level.

TEXT BOOKS:

1. Software Engineering A practitioner's Approach, Roger S. Pressman, Seventh Edition McGrawHill International Edition.
2. Fundamentals of Software Engineering, Rajib Mall, Third Edition, PHI.
3. Software Engineering, Ian Sommerville, Ninth edition, Pearson education

REFERENCE BOOKS:

4. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
5. Software Engineering, A Precise Approach, PankajJalote, Wiley India,2010.
6. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.

Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

SIR C R REDDY COLLEGE OF ENGINEERING :: ELURU
DEPARTMENT OF INFORMATION TECHNOLOGY
COURSE SCHEDULE

The schedule for the whole Course/Subject is:

Unit No	Description of the Chapter	Description of the Topics	Total no of periods (L+T)
1	Part-I: Software Engineering Part-II: Process Models	The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software Myths. A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.	12+2
2	Part-I: Requirements Analysis And Specification Part-II: Software Design	Requirements Gathering and Analysis, Software Requirement Specification (SRS), Formal System Specification. Overview of the Design Process, How to Characterise of a Design?, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design	9+1

3	<p>PART I:</p> <p>Function-Oriented Software Design</p> <p>PART II:</p> <p>User Interface Design</p>	<p>Overview of SA/SD Methodology, Structured Analysis, Developing the DFD Model of a System, Structured Design, Detailed Design, Design Review, over view of Object Oriented design.</p> <p>Characteristics of Good User Interface, Basic Concepts, Types of User Interfaces, Fundamentals of Component-based GUI Development, A User Interface Design Methodology.</p>	11+2
4.	<p>Coding And Testing</p>	<p>Coding, Code Review, Software Documentation, Testing, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tool, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing</p>	7+1
5.	<p>PART I:</p> <p>Software Reliability And Quality Management</p> <p>PART II:</p> <p>Computer Aided Software Engineering</p>	<p>Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model.</p> <p>Case and its Scope, Case Environment, Case Support in Software Life Cycle, Other Characteristics of Case Tools, Towards Second Generation CASE Tool, Architecture of a Case Environment</p>	8+1

6.	<p style="text-align: center;">PART I:</p> <p style="text-align: center;">Software Maintenance</p> <p style="text-align: center;">PART II:</p> <p style="text-align: center;">Software Reuse</p>	<p>Software maintenance, Maintenance Process Models, Maintenance Cost, Software Configuration Management</p> <p>what can be Reused? Why almost No Reuse So Far? Basic Issues in Reuse Approach, Reuse at Organization Level.</p>	6+1
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Total no of instructional periods available for the course : 61 periods

Total no of estimated periods : 61 periods

Signature of the H.O.D

Signature of the Faculty

Date:

	<u>LECTURE PLAN</u>
DEPARTMET	INFORMATION TECHNOLOGY
NAME OF LECTURER	J.Malathi

S.No	Topics to be covered	No. of Lecture Hours	Teaching method
1	The Nature of Software, The Unique Nature of WebApp	1	BB
2	Software Engineering, Software Process	1	BB
3	Software Engineering Practice	1	BB
4	Software Myths	1	PPT With LCD
5	A Generic Process Model	1	BB
6	Process Assessment and Improvement	1	BB
7	Prescriptive Process Models	1	PPT With LCD
8	Specialized Process Models	1	PPT With LCD
9	The Unified Process	1	PPT With LCD
10	Personal and Team Process Models	1	BB
11	Process Terminology, Product and Process	1	BB
12	Requirements Gathering and Analysis	1	BB
13	Software Requirement Specification (SRS)	2	PPT With LCD

14	Formal System Specification	1	BB
15	Overview of the Design Process	1	BB
16	How to Characterise of a Design?	1	BB
17	Cohesion and Coupling	2	BB
18	Layered Arrangement of Modules, Approaches to Software Design	1	BB
19	Overview of SA/SD Methodology	1	BB
20	Structured Analysis	1	PPT With LCD
21	Developing the DFD Model of a System	1	BB
22	Structured Design	1	BB
23	Detailed Design, Design Review	1	PPT With LCD
24	Over view of Object Oriented design.	2	BB
25	Characteristics of Good User Interface	1	PPT With LCD
26	Basic Concepts, Types of User Interfaces	1	PPT With LCD
27	Fundamentals of Component-based GUI Development	1	PPT With LCD BB
28	A User Interface Design Methodology	1	BB
29	Coding, Code Review, Software Documentation	1	BB
30	Testing, Unit Testing, Black-Box Testing	1	PPT With LCD
31	White-Box Testing	1	PPT With LCD
32	Debugging, Program Analysis Tool	1	BB
33	Integration Testing, Testing	1	BB

	Object-Oriented Programs		
34	System Testing, Some General Issues Associated with Testing	1	BB
35	Software Reliability, Statistical Testing	1	BB
36	Software Quality, Software Quality Management System	1	BB
37	ISO 9000	1	BB
38	SEI Capability Maturity Model.	1	PPT With LCD
39	Case and its Scope, Case Environment	1	BB
40	Case Support in Software Life Cycle	1	BB
41	Other Characteristics of Case Tools	1	BB
42	Towards Second Generation CASE Tool, Architecture of a Case Environment	1	PPT With LCD
43	Software maintenance, Maintenance Process Models	2	PPT With LCD
44	Maintenance Cost	1	BB
45	Software Configuration Management	1	BB
46	What can be Reused? Why almost No Reuse So Far?	1	BB
47	Basic Issues in Reuse Approach	1	BB
48	Reuse at Organization Level	1	BB

QUESTION BANK

UNIT-I

SOFTWARE AND SOFTWARE ENGINEERING

1. Give the Characteristics of Software that make it separable to hardware.
2. Explain about the Unique nature of Web Apps.
3. Define Software Engineering. Explain Software Engineering Practice.
4. What is Software? Explain about Software Myths in detail.

PROCESS MODELS

1. What are the steps in a Generic Process Model?
2. Explain the Prescriptive Process Models with example.
3. What are Specialized Process Models? Explain in detail.
4. Explain about Personal and Team process models.

UNIT-II

REQUIREMENTS ANALYSIS AND SPECIFICATION

1. Explain Requirements Gathering and Analysis.
2. List and explain the Techniques involved in Gathering Requirements.
3. Explain about Organization of SRS document.
4. Explain in detail about Formal System Specification.

SOFTWARE DESIGN

1. How to characterize a Good Software Design? Explain.
2. What is Cohesion and Coupling? Explain different types of Cohesion and Coupling in detail.
3. Explain the Layered Arrangement of Modules in Software Design.

UNIT-III

FUNCTION-ORIENTED SOFTWARE DESIGN

1. Explain Structured Analysis and Structured Design in detail.
2. Explain in detail about Context Diagram.
3. Explain in detail about Data Flow Diagrams with examples.
4. Explain in detail about Transformation of a DFD model into Structure Chart.
5. Discuss about Object Oriented Design.

USER INTERFACE DESIGN

1. Explain the Characteristics of Good User Interface Design.
2. Write the Basic concepts of User Interface Design.

3. What are the various Types of User Interface? Explain.
4. What are the Fundamentals of Component-Based GUI? Explain.

UNIT – IV

CODING AND TESTING

1. Explain in detail about Code Review.
2. Discuss about Software Documentation.
3. What is Integration Testing? Classify the Types of Integration Testing.
4. What are Program Analysis Tools? Explain.
5. Explain in brief the General problems associated with Testing.

UNIT – V

SOFTWARE RELIABILITY AND QUALITY MANAGEMENT

1. Explain about Reliability Metrics of Software Products.
2. Explain about Software Quality Management System.
3. Explain the purpose of ISO 9000 Software Quality Model.

COMPUTER AIDED SOFTWARE ENGINEERING

1. What are Characteristics of CASE tools? Explain.
2. Explain the Architecture of a CASE Environment.
3. Describe CASE support in Software Life Cycle.

UNIT – VI

SOFTWARE MAINTENANCE

1. What is Software Maintenance? Explain different types of Maintenance.
2. What is maintenance cost? Explain the Software Configuration Management? Give various roles and responsibilities in it.
3. What are Characteristics of Software Maintenance? Explain.
4. What is Software Maintenance? How do we calculate the Maintenance Cost?

SOFTWARE REUSE

1. What can be Reused? What are Basic Issues in any Reuse Program?
2. What is Software Reuse? Explain Reuse at Organizational Level.