DAYANANDA SAGAR COLLEGE OF ENGINEERING BENGALURU-78

(An Autonomous Institution affiliated to VTU, Belagavi)

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

SOFTWARE ENGINEERING

Course code: 18IS6DCSFE **Credits: 04**
L: P: T: S: 4:0:0:1 **CIE Marks: 50**
Exam Hours: 03 **SEE Marks: 50**
Total Hours: 50

Course objectives:

1. To understand the significance of software engineering principles and methodologies for the development of software projects.
2. To analyze and apply the different process models for various types of software applications.
3. To develop qualitative software projects within project constraints in order to attain sustainability in software projects

Course Outcomes: At the end of the course, student will be able to:

CO1	Apply software engineering principles and methodologies for all projects which will be developed.
CO2	Design and apply appropriate process models depending on the application requirement.
CO3	Develop projects qualitatively within the project constraints.
CO4	Comprehend, analyze and develop projects with people and process management.
CO5	Demonstrate comprehensive knowledge of software testing principles
CO6	Comprehend the basics of Ethics and principles in Information Technology

Mapping of Course outcomes to Program outcomes:

	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS01**	**PSO2**	**PSO3**
CO1	3	2	-	-	-	1	-	1	-	-	-	2	-	-	1
CO2	3	2	-	-	-	2	-	2	-	-	-	1	-	1	1
CO3	3	2	-	-	-	2	-	1	-	-	-	1	-	3	1
CO4	2	1	-	-	-	-	-	-	-	-	-	1	-	-	1
CO5	3	2	-	-	-	-	-	-	-	-	-	1	-	3	1
CO6	3	2	-	-	-	-	-	3	-	-	1	3	-	1	1

Unit.	Content of the Unit	Hours	COs
1.	**Introduction:** software engineering and its significance**,** Professional and ethical responsibility**,** Socio-technical systems, emergent system properties, System engineering, Organizations, people and computer systems, Legacy systems**. Software Requirements**: Software requirements: Functional and Non-functional requirements, User requirements, System requirements, Interface specification, The software requirements document **Requirements engineering process**: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.	**10**	**CO1**
2.	**Software Process Models:** The waterfall model, Evolutionary development model, component based software engineering , Process iteration, process activities, Rational Unified Process Agile methods, Extreme programming, Rapid application development and software prototyping	**10**	**CO1, CO2**
3.	**Design and Development**: Architectural design decisions, system organization, modular decomposition styles, control styles. User Interface design: Design issues, UI design process, user analysis, user interface prototyping and evaluation	**10**	**CO3, CO4, CO5**
4.	**Verification and Validation**: Fundamentals of Software Testing, Types of Testing, Levels of Testing, Software Testing Lifecycle. **Verification and Validation:** Planning; Software inspections; Automated static analysis; Verification and formal methods. **Software testing:** System testing; Component testing; Test case design	**8**	**CO4, CO5**
5.	**Management:** Managing People: Selecting staff; Motivating people; Managing people; The People Capability Maturity Model. Software Cost Estimation: Productivity, Algorithmic cost modelling, Project duration and staffing. **An Overview of Ethics:** What Is Ethics?, Definition of Ethics, The Importance of Integrity, The Difference Between Morals, Ethics, and Laws, Ethics in the Business World ,Corporate Social Responsibility, Why Fostering Corporate Social Responsibility and Good Business Ethics Is Important, Improving Corporate Ethics, Creating an Ethical Work Environment, Including Ethical Considerations in Decision Making, Ethics in Information Technology	**12**	**CO6**

Self-study component:

Note: 1.Questions for CIE and SEE not to be set from self-study component.
2. Assignment Questions should be from self-study component only.

UNIT 1: Safety critical system, availability and reliability, dependability
UNIT 2: CASE tools
UNIT 3: Behavioural models and object oriented design process
UNIT 4: Fault-Based Testing, Flow testing, Test cases for the triangle problem and commission problem
UNIT 5: Intellectual Property, the Impact of Information Technology on Productivity and Quality of Life, Ethics of IT Organizations, Ethics for IT Workers and IT Users

TEXT BOOKS:

1. Ian Sommerville: Software Engineering, 8th Edition, Pearson Education, 2007. (Chap 1-1.2, 2, 4, 6, 7, 11, 16 and 17)
2. Paul C. Jorgensen: Software Testing, A Craftsman's Approach, 3rd Edition, Auerbach Publications, 2008. (Chap 1,2)
3. George W. Reynolds, Ethics in Information Technology, 5th Edition, Strayer University, Cengage Learning, ISBN-13: 978-1-285-19715-9 (Chap 1,2)

REFERENCE BOOKS:

1. Software Engineering: A Practitioners Approach by Rogers S Pressman, 7 editions, McGrawHill, 2007.
2. Aditya P Mathur: Foundations of Software Testing, Pearson Education, 2008.
3. Mauro Pezze, Michal Young: Software Testing and Analysis – Process, Principles and Techniques, Wiley India, 2008.

Assessment Pattern:

CIE –Continuous Internal Evaluation Theory (50 Marks)

Bloom's Category	**Tests**	**Assignments**	**AAT1**	**AAT2**
Marks (Out of 50)	**30**	**10**	**05**	**05**
Remember	10			01
Understand	08	05	01	01
Apply	07	05	02	01
Analyze	05		02	
Evaluate				
Create				02

AAT 1– Alternate Assessment Tool 1: Quiz
AAT 2 - Alternate Assessment Tool 2: Surprise Test
SEE –Semester End Examination Theory (50 Marks)

Bloom's Category	Marks Theory(50)
Remember	05
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	05