SOFTWARE ENGINEERING
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)

<u>**SEMESTER – IV**</u>

Subject Code	**15CS42**	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03

CREDITS – 04

Course objectives:

This course will enable students to

- Outline software engineering principles and activities involved in building large software programs.
- Identify ethical and professional issues and explain why they are of concern to software engineers.
- Describe the process of requirements gathering, requirements classification, requirements specification
- Recognize the need for agile software development, describe agile methods, apply agilepractices .

Module 1	**10 hours**

Introduction: Software Crisis, Need for Software Engineering. Professional Software Development, Software Engineering Ethics.Case Studies.**Software Processes**: Models: Waterfall Model **(Sec 2.1.1)**, Incremental Model **(Sec2.1.2)** and Spiral Model **(Sec 2.1.3)**. Process activities.**Requirements Engineering**: Requirements Engineering Processes **(Chap 4)**. Requirements Elicitation and Analysis **(Sec 4.5).**Functional and non-functional requirements **(Sec 4.1)**.The software Requirements Document **(Sec 4.2)**.Requirements Specification **(Sec 4.3)**.Requirements validation **(Sec 4.6)**.Requirements Management **(Sec 4.7)**.

Module 2	**10 hours**

System Models: Context models **(Sec 5.1)**. Interaction models **(Sec 5.2)**. Structuralmodels **(Sec 5.3)**. Behavioral models **(Sec 5.4)**. Model-driven engineering **(Sec 5.5)**. **Design and Implementation**: Introduction to RUP **(Sec 2.4)**, Design Principles **(Chap 17)**. Object-oriented design using the UML **(Sec 7.1)**. Design patterns **(Sec 7.2)**.Implementation issues **(Sec 7.3)**. Open source development **(Sec 7.4)**.

Module 3	**10 hours**

Software Testing: Development testing **(Sec 8.1)**, Test-driven development **(Sec 8.2)**, Release testing **(Sec 8.3)**, User testing **(Sec 8.4)**. Test Automation **(Page no 42, 70,212,231,444,695)**. **Software Evolution**: Evolution processes **(Sec 9.1)**. Program evolution dynamics **(Sec 9.2)**.Software maintenance **(Sec 9.3)**.Legacy system management **(Sec 9.4)**.

Module 4	**10 hours**

Project Planning: Software pricing **(Sec 23.1)**.Plan-driven development **(Sec 23.2)**.Project scheduling **(Sec 23.3)**: Estimation techniques **(Sec 23.5)**.**Quality management**: Software quality **(Sec 24.1)**. Reviews and inspections **(Sec 24.3)**.Software measurement and metrics **(Sec 24.4)**. Software standards **(Sec 24.2)**

Module 5   **10 Hours**

Agile Software Development: Coping with Change **(Sec 2.3)**, The Agile Manifesto: Values and Principles. Agile methods: SCRUM (Ref "**The SCRUM Primer, Ver 2.0**") and Extreme Programming **(Sec 3.3)**. Plan-driven and agile development **(Sec 3.2)**. Agile project management **(Sec 3.4),** Scaling agile methods **(Sec 3.5)**

Course Outcomes:

After studying this course, students will be able to:
• Design a software system, component, or process to meet desired needs within realistic constraints.
• Assess professional and ethical responsibility
• Function on multi-disciplinary teams
• Use the techniques, skills, and modern engineering tools necessary for engineering practice
• Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems.

Graduate Attributes

• Project Management and Finance
• Conduct Investigations of Complex Problems
• Modern Tool Usage
• Ethics

Question paper pattern:

The question paper will have ten questions.
There will be 2 questions from each module.
Each question will have questions covering all the topics under a module.
The students will have to answer 5 full questions, selecting one full question from each module.

Text Books:

1. Ian Sommerville: Software Engineering, 9th Edition, Pearson Education, 2012.
(Listed topics only from Chapters 1,2,3,4, 5, 7, 8, 9, 23, and 24)
2. The SCRUM Primer, Ver 2.0, http://www.goodagile.com/scrumprimer/scrumprimer20.pdf
Reference Books:
1. Roger S. Pressman: Software Engineering-A Practitioners approach, 7th Edition, Tata McGraw Hill**.**
2. PankajJalote: An Integrated Approach to Software Engineering, Wiley India