

|                              |                                                                            |
|------------------------------|----------------------------------------------------------------------------|
| <b>Branch Name:</b>          | Computer Engineering (Software Engineering)                                |
| <b>Program Code:</b>         | ET203                                                                      |
| <b>Course Title:</b>         | Advanced Software Engineering                                              |
| <b>Course Code:</b>          | 2ET2030105T                                                                |
| <b>Pre-requisite Course:</b> | Fundamentals of Object Oriented Analysis & Design and Software Engineering |

**Course Objective:**

The objectives of this course are:

Complexity in management of software projects has increased drastically in recent times. The objective of the course is to address the issue. The course also aims to provide systematic and organized mythology to manage the software development process. Further, an additional objective of the course is to make the students aware regarding the various techniques, approach, and technical documentation applied during the software development life cycle.

**Teaching and Examination Scheme:**

| Teaching and Examination Scheme: |                                   |   |   |       |                           |      |      |      |                   |      |      |      |                  |
|----------------------------------|-----------------------------------|---|---|-------|---------------------------|------|------|------|-------------------|------|------|------|------------------|
| Credit                           | Teaching Scheme<br>Hours per week |   |   |       | Evaluation Scheme (Marks) |      |      |      |                   |      |      |      | Total<br>(Marks) |
|                                  |                                   |   |   |       | Theory (Marks)            |      |      |      | Practical (Marks) |      |      |      |                  |
|                                  | L                                 | T | P | Total | SEE                       |      | CCA  |      | SEE               |      | CCA  |      |                  |
|                                  |                                   |   |   |       | Min.                      | Max. | Min. | Max. | Min.              | Max. | Min. | Max. |                  |
| 3                                | 3                                 | - | - | 3     | 24                        | 60   | 16   | 40   | -                 | -    | -    | -    | 100              |

**Course Contents:**

| Unit No | Topics                                                                                                                                                                                                     | Total Hours | Weightage (%) |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|
| 1       | <b>Introduction software Engineering:</b> Motivation, Software Process, Generic process model, Product & Process, Review of Software Process Models                                                        | 02          | 08            |
| 2       | <b>Requirement Engineering&amp; Modeling:</b> What is requirement engineering? Requirement Engineering Tasks, requirement analysis.                                                                        | 4           | 17            |
| 3       | <b>Quality Management:</b> What is quality?, Software quality, software quality dilemma, achieving software quality                                                                                        | 4           | 17            |
| 4       | <b>Software quality assurance:</b> Background issues, Elements of software quality assurance, SQA task-goals-metrics, Formal approach to SQA.                                                              | 3           | 13            |
| 5       | <b>Managing software projects:</b> Software Management spectrum, People-process-product-project, W5HH principle, Project metrics, Software measurement.                                                    | 4           | 16            |
| 6       | <b>Software Maintenance &amp; Reengineering:</b> Software maintenance, Reengineering, Reverse engineering, Restructuring Forward engineering                                                               | 3           | 13            |
| 7       | <b>Software process improvement:</b> What is SPI?, SPI process, The CMMI, people CMM, CMMI framework, levels of CMMI, CMMI vs CMM. Study about CASE tool and other 5 tools related to Software Engineering | 4           | 16            |

**Reference Books:**

- Software Engineering: A practical Approach, Roger S. Pressman, McGraw-Hill
- Software Project Management, Sanjay Mohapatra, Cengage Learning
- Software Project Management in Practice, PankajJalote, Pearson
- Software Engineering, Eighth Edition, Sommerville, Pearson
- Software Engineering, Rajiv Mall, PHI

**List of Open-Source Software/learning website:**

- <http://www.rspa.com/index.html>
- <http://nptel.ac.in/courses/106101061/5>
- <http://nptel.ac.in/courses/106105087/>

**Course Learning Outcomes (CLO):**

| Course Outcomes | Description                                                                                                                        | Bloom's Taxonomy Level            |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| COL1            | Acquaint with systematic and organized approach for developing the software.                                                       | Understanding (1)<br>Applying (1) |
| COL2            | Learn an individual as well as teamwork approach for project development.                                                          | Applying (1)                      |
| COL3            | Develop necessary skills for designing a software system using modern tools. Understand various software quality assurance models. | Applying (2)                      |

**Mapping of CLO with PO and PSO**

| Course Learning Outcomes | Program Outcomes (POs) |     |     |     |     |     |     |     |     |      |      |      | Program Specific Outcomes(PSOs) |      |      |      |
|--------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|---------------------------------|------|------|------|
|                          | PO1                    | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1                            | PSO2 | PSO3 | PSO4 |
| CLO1                     | H                      | M   | M   |     | M   |     |     |     |     |      |      |      |                                 |      |      |      |
| CLO2                     | H                      | M   |     |     | M   |     |     |     |     |      |      | L    |                                 |      |      |      |
| CLO3                     | H                      | M   | M   |     | M   |     |     |     |     |      |      |      |                                 |      |      |      |
| CLO4                     | M                      | M   | M   |     | M   |     |     |     |     |      |      | L    |                                 |      |      |      |
| CLO5                     | M                      | M   |     |     |     |     |     |     |     |      |      | L    |                                 |      |      |      |

**H: High, M: Medium, L: Low**