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|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Branch Name:</b>          | Artificial Intelligence & Data Science                                                                                                       |
| <b>Program Code:</b>         | ET108                                                                                                                                        |
| <b>Course Name:</b>          | Software Engineering & Project Management                                                                                                    |
| <b>Course Code:</b>          | 2ET1080403T                                                                                                                                  |
| <b>Pre-requisite Course:</b> | It is for absolute beginners. Though, awareness about software systems, software development process and awareness about project management. |

### Course Objective:

- To understand software development life cycle
- To understand to gather & analyse requirement of client before developing system for them.
- Learn that how to use various diagrams to design and model your system before develop it.
- To learn testing techniques to improve quality the developed software

### Teaching and Examination Scheme:

| Credit | Teaching Scheme<br>Hours per week |   |   |       | Evaluation Scheme (Marks) |      |      |      |                   |      |      |      |                  |
|--------|-----------------------------------|---|---|-------|---------------------------|------|------|------|-------------------|------|------|------|------------------|
|        |                                   |   |   |       | Theory (Marks)            |      |      |      | Practical (Marks) |      |      |      | Total<br>(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              |

| Subject Contents |                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |            |  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|--|
| Sr. No           | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                      | Total Hours | Weight (%) |  |
| 1                | <b>Basics of Software Engineering:</b><br>Define: Software and Software Engineering, Software Process, Software Engineering: A Layered Technology, Software Development life cycle (SDLC) and models: Water fall model, incremental model, RAD model, spiral model, Prototype model., Introduction to Agile process model, Agile development                                                                                               | 07          | 20         |  |
| 2.               | <b>Requirement Analysis:</b><br>Requirement engineering, Analyse the problem and gathering requirement, Requirement engineering tasks, Functional and non functional requirement, Software requirement specification(SRS), Requirement modeling and its importance.                                                                                                                                                                        | 06          | 15         |  |
| 3.               | <b>Design and Modeling with UML:</b><br>Software design concepts, Coupling and cohesion, UML diagrams: Usecase diagram, class diagram, data flow diagram, activity diagram, Data dictionary, Software designs: Function oriented design and object oriented design, Software design approaches: top down and bottom up approach Architectural design, Component-Level design, User-Interface Design, Pattern Based Design, Web-App Design. | 08          | 20         |  |

|           |                                                                                                                                                                                                                                                                                                                                                                                                                            |    |    |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| <b>4.</b> | <b>Software Testing:</b><br>Software testing concept, designing of test cases and Testing techniques, Unit testing, black box testing, white box testing, testing web and mobile application, Testing tools (winrunner, loadrunner), testing documentation.                                                                                                                                                                | 08 | 20 |
| <b>5.</b> | <b>Introduction to Software Project Management:</b><br>Introduction, Why is Software Project Management Important?, Contract Management and Technical Project Management, Activities Covered by Software Project Management, Plans, Methods and Methodologies, Project Success and Failure, What is Management? Management Control, Project Management Life Cycle, Traditional versus Modern Project Management Practices. | 04 | 10 |
| <b>6</b>  | <b>Project Evaluation and Programme Management:</b><br>Introduction, Business Case, Project Portfolio Management, Evaluation of Individual Projects, Cost–benefit Evaluation Techniques, Risk Evaluation, Programme Management, Managing the Allocation of Resources within Programmes, Benefits Management.                                                                                                               | 06 | 15 |

#### Course Outcome:

After learning this course student will understand the actual process of software developing. Student can analyse the whole software from initial phase. At the end of this course learner can test software quality via various testing techniques and evaluation of project management techniques.

#### List of Text Books:

1. Roger S. Pressman, Software engineering-Apractitioner's Approach, McGraw-Hill International Editions
2. Project Management and Tools & Technologies, Shailesh Mehta, Edition 1st

#### List of reference books:

1. Ian Sommerville, Software engineering, Pearson education Asia
2. Rajib Mall, Fundamentals of software Engineering, Prentice Hall of India.
3. Software Project Management, Walker Royce

**Course Learning Outcomes (CLO): On completion of this course, the students will be able to:**

| CLO  | Description                                                                                                          | Bloom's Taxonomy Level                |
|------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| CLO1 | Prepare SRS (Software Requirement Specification) document and SPMP (Software Project Management Plan) document.      | 3 Applying<br>4 Analyze<br>6 Creating |
| CLO2 | Apply the concept of Functional Oriented and Object Oriented Approach for Software Design.                           | 5 Evaluate,                           |
| CLO3 | Recognize how to ensure the quality of software product, different quality standards and software review techniques. | 1 Remembering<br>2 Understanding      |
| CLO4 | Apply various testing techniques and test plan in.                                                                   | 2 Understanding<br>3 Applying         |
| CLO5 | Able to understand modern Agile Development                                                                          | 2 Understanding                       |

**Mapping of CLOs with POs & PSOs**

| 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                     | L   | L   |     |     |     | L   |     |     |      | L    | M    | H                                | M    |      |      |
| CLO2                     |                       | M   |     |     |     | L   |     | M   |     | H    |      |      | H                                | M    |      |      |
| CLO3                     | L                     |     |     |     | M   |     |     | M   |     |      | L    |      | H                                | M    |      |      |
| CLO4                     |                       | M   |     |     |     | M   |     |     |     |      |      |      |                                  |      |      |      |
| CLO5                     |                       |     | M   |     |     |     | L   | L   |     |      | L    |      | L                                |      |      |      |

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