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|---------------------------------|--------------------------------------------|
| <b>Subject Code: 1ET4040403</b> | <b>Subject Title: Software Engineering</b> |
| <b>Pre-Requisite</b>            | --                                         |

#### **RATIONALE:**

Software is the single most important technology on the world stage. Software's are used by almost all peoples for various purposes such as withdrawing payments from ATM machines, paying bills of electricity, telephone using ECS systems, Airline, railway tickets reservation online etc. People can work with computers flawlessly over a long period of time. One can also easily modify, upgrade the software without any problem or error. This course helps the students to understand the concept of software development, designing, analyzing, testing & implementation during the courses in higher semesters of diploma programme.

#### **COURSE OBJECTIVE:**

Helps students to develop skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain.

#### **TEACHING AND EVALUATION SCHEME:**

| <b>Teaching Scheme (Hours per week)</b> |          |           |        | <b>Evaluation Scheme (Marks)</b> |                       |                       |                       |
|-----------------------------------------|----------|-----------|--------|----------------------------------|-----------------------|-----------------------|-----------------------|
| Lecture                                 | Tutorial | Practical | Credit | Theory                           |                       | Practical             |                       |
|                                         |          |           |        | University Assessment            | Continuous Assessment | University Assessment | Continuous Assessment |
| 3                                       | -        | 2         | 4      | 60                               | 40                    | 20                    | 30                    |

#### **DETAILS OF COURSE CONTENTS:**

| <b>S. NO.</b> | <b>Topic and Sub-Topics</b>                                                                                                                                                                                                                                                                         | <b>Total Hrs.</b> | <b>WEIGHTAGE %</b> |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| Unit - 1      | <b>Software Development Process</b><br>Introduction to Software and Software Engineering, Characteristics of Good Software, Program Vs. Software, Software Engineering - A layered technology, SDLC, Software Development Models– Waterfall model, Incremental Model, Prototype Model, Spiral model | 10                | 20                 |
| Unit - 2      | <b>Requirement Analysis and Specification</b><br>Requirement Analysis and gathering, Software Requirement Specification(SRS), Characteristics of SRS document, Functional and Non functional Requirements, Feasibility Study                                                                        | 08                | 20                 |
| Unit - 3      | <b>Software Designing and Modeling</b><br>Modularization, Entity Relationship Model, Data Flow Diagram(DFD), Use Case Model, Activity Diagram, Sequence Diagram                                                                                                                                     | 08                | 20                 |

|          |                                                                                                                                                                                                                                               |    |    |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| Unit - 4 | <b>Software Project Management</b><br>Responsibility and skills Software Project Manager,<br>Metrics for Project Size Estimation, Empirical<br>Estimation Techniques, COCOMO-A Heuristic<br>Estimation Technique, Scheduling, Risk Management | 08 | 20 |
| Unit - 5 | <b>Software Coding and Testing</b><br>Code Review - Code walk through & Code Inspection,<br>Software Documentation – Internal & External<br>Documentation, Testing – Unit Testing, System Testing,<br>Black box Testing and White box Testing | 08 | 20 |

### **COURSE OUTCOME:**

At the end of the course the students are able to:

- Explain Software and Software Engineering
- Distinguish various Software Process Models (Approach of Software Development).
- Analyze gather and prepare Software Requirement Specification for given project.
- Draw use case diagrams, Activity diagrams, DFD for given modules and design user interface.
- Apply code standard and Identify Software Testing Techniques.

### **SUGGESTED LIST OF EXERCISES/PRACTICAL/EXPERIMENTS:**

- Identify the development model for software with proper explanation
- Gather requirement for software
- Prepare Feasibility study
- Prepare SRS Document for Software
- Design Activity Diagram for system
- Design Use-case Diagram for system
- Design Data Dictionary of system
- Prepare E-R Diagram of System
- Design Data Flow Diagram of system
- Prepare suitable test case for system testing

### **SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

Application for practical will be assigned to the students by the subject faculty and students will work in a group (Maximum 3 per group)

## **LIST OF REFERENCES:**

### **Text Books**

- Software Engineering: A Practitioner's Approach by Roger S. Pressman (Tata McGraw Hill)
- Fundamentals of Software Engineering by Rajib Mall (PHI)
- Structured System analysis and Design by Madhulika Jain (Bpb Publication)

### **Reference Books**

Software Engineering by Ian Somerville (Pearson Education PHI)

### **E- Learning References**

- i. <http://nptel.iitm.ac.in/>
- ii. <http://www.mhhe.com/engcs/compsci/pressman/student/olc/cases.mhtml>
- iii. [http://forum.jntuworld.com/showthread.php?3841-SOFTWARE-ENGINEERING-\(SE\)-Notes-All-8-Units](http://forum.jntuworld.com/showthread.php?3841-SOFTWARE-ENGINEERING-(SE)-Notes-All-8-Units)
- iv. Ppts: [www.facweb.iitkgp.ernet.in/~spp/LECT1.ppt](http://www.facweb.iitkgp.ernet.in/~spp/LECT1.ppt)
- v. Ppts: <http://www.phindia.com/rajibmall/chapters/>