|  |  |
| --- | --- |
| **Course-23 Title: Software Engineering** |  |
| **Course No . : CIT 213 - Credit : 3 Contact Hours: 3** | **Total Marks: 100** |

**10.1 Rationale:**

To become a Computer Engineer, one needs to be knowledgeable in project management, process models, testing and validation

**10.2 Objectives:**

Students will be

* Able to understand different software engineering steps for developing software
* Able to evaluate different process and project management models and tools
* Able to test and validate software

|  |  |  |  |
| --- | --- | --- | --- |
| **10.3**  **Learning Outcomes** | **10.4**  **Course Content** | **10.5**  **Teaching - Learning Strategy** | **10.6 Assessment Strategy** |
| * Define software Engineering * Demonstrate Program practice * Compare Process models | **Concepts of software engineering:** Overview, definition, requirement, specification, design, language issues, programming practice, testing and debugging, documentation, prototyping, life-cycle models, S/W process models, Large and integrated software, Problem of software modification and maintenance. | **Lecture**  **Exercise**  **Demonstration** | **Quiz**  **Assignment** |
| * Apply program design tools and techniques * Justify modular design, object oriented software engineering | **Program design tools and techniques:** Top-down and bottom-up design, Design representation, structured programming, data directed design techniques, Modular design, Object oriented software engineering, Approaches to programming. Implementation language, Software tools. | **Lecture**  **Exercise**  **Demonstration** | **Quiz**  **Assignment** |
| * Define Complexity * Analyze complexity measures, processing | **Complexity, Storage and processing time analysis:** Complexity measures, memory requirements, processing time | **Lecture**  **Exercise**  **Demonstration** | **Quiz**  **Assignment** |
| * Apply program testing | **Program testing:** Statistics on testing process, Test philosophy and type, different test methods, Comparing different test methods, classification of tests. | **Lecture**  **Exercise**  **Demonstration** | **Quiz**  **Assignment** |
| * Assess software reliability | **Software reliability:** Reliability theory, Concept of software repair and availability, Software errors and faults, Estimating number of bugs in a program, reliability models, availability models, Data collection, storage and retrieval. | **Lecture**  **Exercise**  **Demonstration** | **Quiz**  **Assignment** |
| * Discuss Management technique * Assess different management technique | **Management technique:** Requirements, specifications and initial design, performance, reliability and quality measures, management and communication skills, Software project Organization, Cost estimation, managing and development process, software maintenance, Computer Aided Software Engineering (CASE) tools, The design and implementation of large, multi-module program systems. | **Lecture**  **Exercise**  **Demonstration** | **Quiz**  **Assignment** |

**Recommended Books**:

1. Reifer :"Software Management 5/e"

2. Thayer :"Software Engineering Project Management 2/e"

3. Wilson :"Software Architecture: Prospective on an Emerging Discipline"

4. Ohezzi, M. Jazayeri and D. Mandrioli :"Fundamentals of Software Engineering"

5. R.S. Pressman :"Software Engineering: A Practitioners Approach, 3rd Ed."

6. R. Wirfs-Brock et.al. :"Designing Object-oriented Software"

7. Ian Sommerville : “ Software engineering” 6th Ed