|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name of the course** | | **Software Engineering** | | |
| **Course Code: PEC(IT)602A** | | **Semester: 6th** | | |
| **Duration: 6 months** | | **Maximum Marks: 100** | | |
|  | |  | | |
| **Teaching Scheme** | | **Examination Scheme** | | |
| Theory: 3 hrs./week | | Mid Term I Exam: 15 Marks | | |
| Credit Points: 3 | | Mid Term II Exam: 15 Marks | | |
|  | | Class performance & Attendance: 20 Marks | | |
|  | | End Semester Exam & Viva: 50 Marks | | |
|  | |  | | |
| **Objective:** | | | | |
| 1. | To understand different software process models. | | | |
| 2. | To analyze software testing activities. | | | |
| 3. | To determine software reliability and quality. | | | |
| 4. | To assess different tools for software project management. | | | |
| **Pre-Requisite:** | | | | |
| 1. | Data Structures & Algorithms -PC(CS/IT)302 | | | |
| 2. | Mathematics III-BS(CS/IT)307 | | | |
| Unit | Content | | Hrs. | Marks |
| 1 | **Information System:**  Software Engineering –Objectives, Definitions, Software development life cycle, Software Process models – Waterfall Model, Spiral model, Agile model. Software Requirements (SRS), Feasibility Analysis. | | 6 |  |
| 2 | **Software Design:**  Context diagram and DFD, Physical and Logical DFDs, Data Dictionary, ER diagrams, Decision tree, decision table and Structure chart, Structured English. | | 4 |  |
| 3 | **Software Testing:**  Levels of Testing, White-box and Black-box Testing, Test Case  Generation, Acceptance Testing, Software Validation, Regression Testing, Mutation Analysis, Cyclomatic complexity. | | 10 |  |
| 4 | **Reliability:**  Reliability concept, Software Reliability, Hazard, MTTF, MTBF, Repair and Availability. | | 4 |  |
| 5 | **Software Quality:**  Quality attributes, Risk Management, McCall’s quality factors, Software Quality Assurance, quality standards, Total Quality Management. | | 4 |  |
| 6 | **Software Project Management:**  Software Project Planning, Project Scheduling, Software Configuration Management, Cost estimation-COCOMO, function point analysis, Halstead metric, Project management tools- WBS, Gantt chart, PERT, Critical Path Method. | | 8 |  |
| **Course Outcome:**  **After completion of the course students will able to** | | | | |
| CO1 | Select different software development process models. | | | |
| CO2 | Develop the software architecture/design using design tools. | | | |
| CO3 | Apply different testing and debugging techniques. | | | |
| CO4 | Analyze software risks, reliability, and failure. | | | |
| CO5 | Determine the concept software quality. | | | |
| CO6 | Implement different tools for software project management. | | | |
| **Learning Resources:** | | | | |
| 1 | Software Engineering: A practitioner’s approach– R.G. Pressman (TMH) | | | |
| 2 | Software Engineering- I. Somerville (Pearson Education) | | | |
| 3 | Software Engineering- Rajib Mall (PHI) | | | |
| 4 | Software Engineering –Agarwal and Agarwal (PHI) | | | |
| 5 | Software Engineering- Pankaj Jalote (Wiley-India) | | | |
| 6 | Fundamentals of Software Engineering- C. Ghezzi, M. Jazayeri, and D. Mandrioli (PHI) | | | |
| 7 | Software Engineering Fundamentals- Behforooz (OUP) | | | |