CSE3111: Software Engineering

75 Marks [70% Exam, 20% Quizzes/Class Tests, 10% Attendance]

3 Credits, 33 Contact hours, Exam. Time: 3 hours

Introduction: Introduction to software engineering, Importance of software, The Software evolution, Software characteristics, Software components, Software applications, Crisis-Problem and causes.

Software development life-cycle: Requirement analysis, software design, coding, testing and maintenance etc.

Software requirement Specification: Water fall model, prototyping interactive enhancement, spiral model role of management in software development, role of matrices and measurement, Problem analysis, requirement specification, validation, matrices, monitoring and control.

System Design: Problem partitioning, abstraction, top down and bottom up – design, structured approach, functional versus object-oriented approach, design specification and verification matrices, monitoring and control, Cohesiveness, coupling, 4 GL. Visio, DFD, Rational Rose, Visio, VS architectural design.

Coding: TOP-DOWN and BOTTOM-UP structure programming, information hiding, programming style, and internal documentation, verification, metrics, monitoring and control, Subversion, Team System, Source Safe

Testing: levels of testing, functional testing, structural testing, test plane, test class specification, reliability assessment, Software testing strategies, Verification and validation, Unit, Integration Testing, Top down and bottom up integration testing, Alpha and Beta testing, System testing and debugging. NUnit for unit testing, Selenium, WebLoad

Software project Management: Cost estimation, project scheduling, staffing, software configuration management, structured Vs unstructured maintenance, quality assurance, project monitoring, risk management. Agile-XP, scrum, Rally, Version One, Bugzilla, Visual Studio Team System, Agile project management, comparison with traditional process, Next generation software engineering

Function oriented and object-oriented Software design: Overview of SA/SD Methodology, structured analysis, data flow diagrams, extending DFD to real time systems, Object oriented design, Graphical representation of OOD, Generic OO development paradigm.

Software Reliability and Quality Assurance: Reliability issues, Reliability metrics, reliability growth modeling, Software quality, ISO 9000 certification for software industry, SEI capability maturity model, comparison between ISO & SEI CMM, NANT, CruiseControl.Net for automated build.

Books Recommended:

1. Roger S. Pressman : **Software Engineering, A practitioner's Approach,** *McGraw-Hill*
2. Ian Sommerville : **Software Engineering**, *Pearson Education.*
3. Richard Fairley : **Software Engineering Concepts**, *McGraw-Hill.*
4. Robert N. Charette : **Software Engineering Environments,** *McGraw-Hill.*
5. S. L. Pfleeger and J.M. Atlee : **Software Engineering Theory and Practice**, *Pearson Education.*

CSE3112: Software Engineering Lab
25 Marks [60% Practical, 30% Quizzes/Viva-voce, 10% Attendance]
1 Credit, 22 Contact hours

Laboratory works based on **CSE3211**

CSE3162: Mobile Apps Development Lab
25 Marks [60% Practical, 30% Quizzes/Viva-voce, 10% Attendance]
1 credits, 22 Contact hours