AIT 221　　　SOFTWARE ENGINEERING　　　　　　　　　　　　　　3(2+1)

UNIT I
Introduction
Introduction to Software Engineering, Software Components, Software Characteristics, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

UNIT II
Software Requirement Specifications (SRS) and Software Project Management
Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, SRS Document, IEEE Standards for SRS. Cost Estimation, Project Scheduling, Quality Assurance Plan, Project Monitoring Plans, Gantt Charts (Timeline chart for the entire project) , PERT (Program evaluation and review technique) , CPM (Critical path method)

UNIT III
Software Design
Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, Software Measurement and Metrics: Various Size Oriented Measures: Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs.

UNIT IV
Structured Programming Coding and Software Testing
Programming practices, Verification, Monitoring and Control, Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards. Testing Objectives, UNIT Testing, Integration Testing: Testing Fundamentals, Functional Testing, Structural Testing, Test Plan activities, UNIT testing, Integration Testing.

UNIT V
Software Reliability and Maintenance
Reliability: Concept of Software Reliability, Reliability Models, Limitations of Reliability Models Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools.

Practical
1.　Using any development tool like Rational Rose Perform SA/SD for the following types of problems.
　- Hotel Automation System
　- Book Shop Automation Software
　- Word processing Software
　- Software Component Cataloguing Software.
　- Payroll System
　- Banking System
　- Purchase Order System
　- Library Management System
　- Railway Reservation System
　- Bill Tracking System
　- College Admission System
2.　Illustration of various activities of Software Project Management using MS Project .

Reference Books

1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
3. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
4. Carlo Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication.
5. Ian Sommerville, Software Engineering, Addison Wesley.