3MCACC3: SOFTWARE ENGINEERING

Total No. of Hours: 52 **Hours/Week: 04**

Course Objective: Equip with knowledge and skills of software development process

Course Outcome: Students will be able to

CO1: Understand different software engineering process models and the principle of requirement engineering

CO2: Understand design engineering and analyse various architectural styles and patterns.

CO3: Understand component level design and familiarize with quality management and SQA plan.

CO4: Understand and analyse various testing strategies

CO5: Understand project and risk management and analyse various metrics for project estimation

Unit I	**Introduction to Software Engineering**: Software- Characteristics of software- Categories of software, Legacy software-software Myths. **Generic View of Process**: Software Engineering-A layered technology- process framework- Capability Maturity Model Integration (CMMI)-Product and Process, **Process Models**: The waterfall Model- Incremental Model- Evolutionary Process Model- Specialized process models, Component based Development, The formal Methods Model – Agile process model. **Requirements Engineering**: Requirement engineering Initiating the requirement engineering process- Eliciting requirements- Developing use cases,-building the requirements model - Negotiating requirements- validating requirements.	10 hrs
Unit II	**Design Engineering**: The design within the context of Software Engineering- The design process and Design quality- Design concepts – Design Model. **Architectural Design**: Software architecture – Architectural style and Patterns – Architectural Design –Architectural mapping using Data flow, Transform Mapping, Refining Architectural Design.	8 hrs
Unit III	**Component Level Design**: What is a component – Designing class based components – Designing conventional components. **User Interface Design**: The golden rules – User Interface Analysis and Design - Interface Analysis User - Interface design steps **Quality Management**: Software Quality, McCall's Quality Factors, ISO 9126 Quality Factors – Quality concepts – Software Quality Assurance – Software Reviews – Formal Technical reviews – Formal approaches to SQA – Software reliability – The ISO 9000 Quality Standards – SQA plan	10 hrs

Unit IV	**Testing Strategies:** A Strategic approach to software testing – strategic issues – Test strategies for conventional software – Test strategies for Object Oriented software – Validation testing – System testing – The art of Debugging. **Testing Tactics:** Software testing fundamentals - White-box testing - Basic path testing - Control structure testing - Black-box testing – Testing for specialized environments, Architectures, and Applications	12 hrs
Unit V	**Project Management:** The management spectrum - The people - The product - The Process - The project. **Metrics for Process and Projects**: Metrics in the process and project domains - software measurement- Metrics for software quality. **Estimation**: Observations on estimation - The project planning process - Software scope and Feasibility- Resources- Software project estimation - Decomposition techniques – Empirical estimation models. **Project Scheduling**: Basic concepts – Project Scheduling - Scheduling. **Risk Management**: Software risks - Risk identification - Risk projection - Risk Refinement - Risk Mitigation, Monitoring, and Management - The RMMM plan.	12 hrs

REFERENCE BOOKS

[1] Pressman S Roger, "*Software Engineering A Practitioner's Approach"*, McGraw Hill, Seventh edition, 2010

[2] Somerville, Ian, "*Software Engineering"*, Addison Wesley, Ninth edition.

[3] PankajJalote: "*Software Engineering"*, Wiley India Pvt. Ltd.