RKUNIVERSITY

SYLLABUS

Course Title	**Software Engineering & Testing**
Course Code	**MCAL215**
Course Credit	Theory(Hrs) : 3
	Practical(Hrs) : 0
	Tutorial(Hrs) : 0
	Credits : 3

Course Objectives

The objectives of the course are:

- To identify an appropriate process model and apply on software development process
- To develop DFD and UML diagrams of the real world problem
- To understand testing strategies and testing techniques
- To plan and schedule the project using project management techniques

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
	Section – I	
1	**Software, Software Process Models and Agility** Introduction: Software and Software Engineering, Software Application Domains, Software Development Process, Software models: Waterfall Model, Incremental Model, Evolutionary Model, Concurrent Model, Agility : Introduction, Agile Process, Agile Process Models : XP, Scrum	**06**
2	**Software Requirement Engineering** Basics of Requirement Engineering, Different tasks for requirement	**02**

	Engineering, Overview of SRS	
3	**Software Design Engineering** Design Concepts, Software Design Model: Architectural Design, Component Level Design : Concepts of Coupling & Cohesion & its types, User Interface Design : Golden rules, Analysis & Design of UI Pattern Based Software Design and Different Design Patterns	**05**
4	**Anatomy of UML** Overview of UML, Building Blocks of the UML – Things (Structural) and Relationships	**02**
5	**Data Flow Diagram & UML Diagrams** DFD : Overview, Notations, Development (up to 2nd Level) Overview of different types of UML diagrams, Development of UML Diagrams - Class Diagram, Use-case Diagram, Sequence Diagram, Activity Diagram, Case Study on UML diagrams and SRS	**06**
Section – II		
6	**Software Testing** Strategic Approach to Testing, Issue of Software Testing, Software Testing Strategies: Unit, Integration, Validation, System Unit and Integration Testing for Conventional Software, System Testing, Debugging Techniques White-Box Testing : Basis Path Testing, Control Structure Testing Black- Box Testing: Model-Based Testing	**10**
7	**Software Project Management, Estimation and Scheduling** Introduction to Software Project Management, Project Decomposition Techniques : FP, LOC, Empirical Estimation Models : COCOMO - II, Project Scheduling : Time-line charts, Tracking Schedule	**09**
8	**Case study** Software Development Process and Project Estimation and Scheduling	**02**

Instructional Method and Pedagogy:

- Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Understand** the principles of large scale software systems, and the processes that are used to build them
- **Acquire** skills to think about problems and their solutions using appropriate methods of analysis and design
- **Investigate** and **improve** the specification of a software system
- **Identify** the risks in software development process
- **Design** and **apply** testing strategies for software applications
- **Prepare** and **deliver** coherent and structured verbal and written technical reports

Text books:

- Title : Software Engineering : A Practitioner's Approach, TMGH Publication
  Author(s): Pressman R.S.
- Title : The Unified Modeling Language User Guide, Pearson
  Author(s): Grady Booch, James Rumbaugh, Ivar Jacobson

Reference Books:

- Title : Software Engineering, Addision-Wesley
  Author(s): Sommerville I.
- Title : Software Engineering – Principles and Practices, TMGH Publication
  Author(s): Waman S. Jawadekar
- Title : Fundamentals of Software Engineering, PHI Publication
  Author(s): Rajib Mall
- Title : Analysis and Design of Information Systems, TMGH Publication
  Author(s): James A. Senn

Additional Resources

- http://www.ece.rutgers.edu/~marsic/books/SE/links
- http://www.sei.cmu.edu
- http://people.engr.ncsu.edu/txie/sefamily.htm
- http://www.computer.org/portal/web/swebok