Suggested Teaching Guidelines for
Software Application Development Tools & Techniques, PG-DAC
August 2018

Duration: 40 class room hours

Objective: To acquire the knowledge of Software Engineering and Hands–On awareness of Project Management Software

Prerequisites: Fundamentals of Computer and Clarity of OOP concepts

Evaluation method: Theory exam– 40% weightage
Internal exam– 60% weightage

List of Books / Other training material

Textbook:

1. Software Engineering by Chandramouli

Reference Book:

1. Software engineering by Ian Sommerville
2. Agile Project Management with Scrum by Ken Schwaber
3. The Mythical Man-Month: Essays on Software Engineering by Frederick P. Brooks Jr.
4. User Stories Applied: For Agile Software Development 2016 by Mike Cohn

Session 1

- Introduction to Software Engineering
    a. Software Process
    b. Software Process Model
    c. Software Product
- Requirements Engineering
    a. Types of Requirements
    b. Steps involved in Requirements Engineering
    c. Requirement Analysis Modelling

Session 2 ,3

- Design and Architectural Engineering
    a. Characteristics of Good Design
    b. Function Oriented vs Object Oriented System
    c. Modularity, Cohesion, Coupling, Layering
    d. Design Models
    e. UML
- Object Oriented Analysis and Design

Session 4:

- User Interface Design
    a. Good User Interface Designing
    b. User Interface Model
    c. Usability
- Coding

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a. Programming Principles
b. Coding Conventions

Session 5:

- Software Metrics
  a. Line of Code
  b. Function Point Count(Fp Estimation)
  c. Extended Function Point Metrics
  d. Object Oriented Metrics
- Software Configuration Management
  a. Basic Concepts
  b. Software Configuration Management Process
  c. Configuration Identification and Control
  d. SCM and SEI Capability Maturity Model

Session 6:

- Project Management
  a. Process and Project
  b. Project Management
  c. Program Management
  d. Portfolio Management
  e. Project Scope Management
  f. Project Quality Management

Session 7:

- Risk Analysis and Management
  a. Software Risk
  b. Risk Management Plan
- Project Time and Cost Management
  a. Time Management
  b. Cost Management

Session 8:

- Software Testing
  a. Psychology of Testing
  b. Testing Scope and Objective
  c. Type of Software Testing

Session 9:

- Software Maintenance
  a. Maintenance Activities, Process and Cost
  b. Difference between Software Maintenance and Support
  c. Common Metrics in Software Maintenance and support

Session 10, 11, 12:

- Agile Software Development
  a. What is Agile?
  b. Characteristics of Agile Projects
  c. Agile Manifesto
  d. Generic Agile Project Life Cycle
  e. Agile Concepts

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f. Epic, Futures, User Stories
g. Communication in Agile Projects
h. Agile Methodologies
i. Scrum
j. Kanban
k. XP
l. Agile Project Management
m. Scaling Agile Methods

Session 13:

- Case Study: SDLC Case Study

Session 14:

- Case Study: Software Project Management Lifecycle – a Product Development Case Study

Session 15:

- Case Study: Maintenance Project Case Study- Life Cycle and How it is Managed

Session 16:

- Case Study: Testing Case Study – How the Testing Methodologies are Used in a Project

Session 17, 18, 19, 20:

- Emerging Trends
    a. Rapid Delivery
    b. Open Source Software Development
    c. Web Services
    d. Security Engineering
    e. Service Oriented Software Engineering
    f. Aspect Oriented Software Development
    g. Test Driven Development
    h. Social Computing