Source Book

Course in IT Project Management

Version 1.0

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Objective of the course:

The objective of this course is to provide the student with an expertise in Project Management.

Eligibility Criteria: Any Engineering Graduate
Computing background: Sound computing background, knowledge of OOPS concepts.

Prerequisite:

Familiarity with Computer Fundamentals, Programming Fundamentals, Database concepts and Object Oriented Programming Concepts.

Schedule:

Week	Session 1	Session 2
1	Introduction to IT Project Management	Introduction to IT Project Management
2	Software Development Life Cycle	Software Development Life Cycle
3	Software Development Life Cycle	Software Development Life Cycle
4	Software Development Life Cycle	Software Development Life Cycle
5	Software Development Life Cycle	Software Estimation Techniques
6	Software Estimation Techniques	Information security
7	Information security	Information security
8	Testing Tools	Testing Tools
9	Testing Tools	Testing Tools
10	Project Management Tools	Project Management Tools
11	Project Management Tools	Project Management Tools
12	Project Management Tools	Software Configuration Management
13	Software Configuration Management	Software Configuration Management
14	Software Configuration Management	Introduction to Six Sigma Concepts
15	Introduction to Six Sigma Concepts	Introduction to Six Sigma Concepts
16	Introduction to Six Sigma Concepts	Introduction to Six Sigma Concepts
17	Quality management system	Quality management system
18	Quality management system	Quality management system
19	Placement	
20		
21		
22		

Course Module:

Sr. No.	Module Name	Hours
1	Introduction to IT Project Management	20
2	Software Development Life Cycle	60
3	Software Estimation Techniques	20
4	Information security	30
5	Testing Tools	40
6	Project Management Tools	40
7	Software Configuration Management	40
8	Introduction to Six Sigma Concepts	40
9	Quality management system	30
	Total	**320**

Day-Wise breakup:

Module Name: Introduction to IT Project

Management Duration: 20 class room hours

Session 1:
Lecture

- Introduction to Software and Software Engineering
- Software Process

Assignment – Reading:

- Brook's paper on Mythical man month Addison-Wesley 1975

Session2 : Lecture

- SDLC and Process Models

Assignment:

- Describe and compare different SDLC models

Session 3:
Lecture
Requirement Engineering

- Requirement analysis
- Use case approach
  - Use cases & usage scenarios
  - Identifying use cases
  - Use cases & functional requirements
  - Benefits of Use cases

Assignment:

- Compare traditional and Object Oriented based requirement analysis techniques

Session 4:
Lecture

- Design concepts

Assignment:

- Develop five levels of abstraction of problems defined in above requirement analysis cases

Session :
Lecture

- Software implementation and maintenance
- Software testing
  - Unit testing
  - Integration testing
  - Acceptance testing
  - Performance testing

Assignment Reading:

- structured programming, language standards

Session 6:

Lecture

- Software Quality Assurance
- Software Quality Attributes
  - Defining quality attributes
  - Attribute trade-offs

Assignment Reading:

- CMMI Model, ISO 9001:2000 standard

Assignment Reading:

- Reading on Personal software process and team software process

Session 7:

Lecture

- Project Planning
- Project Management Definition
- Distinctive characteristics of Software
- Scope, Organizing, Planning,

Assignment Reading:

- Software projects are different, Max Bullock & Wideman

Assignment - Tutorial:

- Project Management, Heinz

Session 8:

Lecture

- Scheduling, Graphical Schedule representations
- Activity Organization, Milestones, Deliverables
- Task Dependencies,
- Staffing, Communication

Assignment – Lab/Tutorial:

- MS Project > Help > Quick Preview
- MS Project > Help > Create your project

Module Name: Software Development Life Cycle

Duration: 34 class room hours + 26 Hours lab

Session 1:
Lecture
Introductio
n to SE
The Software Process

Assignment – Reading:

- Brook's paper on Mythical man month Addison-Wesley 1975

Session 2 & Session 3:
Lecture
Software Process Models
The Linear Sequential
Model The Prototyping
Model
The RAD Model
Evolutionary Software Process
Models The Incremental Model

Session 4 & 5:
Lecture
The Spiral Model
The Concurrent Development
Model Component-Based
Development The Formal
Methods Model
Fourth Generation Techniques
Process Technology
Product and Process

Assignment:
Describe and compare different SDLC models

Session 6 & 7:
Lecture
Software Standards
SRS Document preparation
(SRS) Vision Document
NW Architecture
Interface Design Description
(IDD) Operational Concept
Design (OCD)

Assignment:

Compare traditional and Object Oriented based requirement analysis techniques

Session 8 & Session 9:
Lecture
Dataflow Diagram and Entity Relationship Diagram

Assignment:
Compare Dataflow Diagram and Entity Relationship Diagram

Session 10 & 11:
Lecture
Normalization techniques
Why Normalize?
Type of Normalization
1NF, 2NF, 3NF, rules with examples
Advantages & disadvantages of Normalization

Assignment:
Specify all functional dependencies without redundancies for each table of the library database. Then state which normal form (1NF, 2NF, 3NF or BCNF) each of the existing tables is, and why.

Session 12 & 13:
Lecture
Introduction to Database Design The Basics of Relational Design Planning a Database
Data dictionary

Assignment:
Explore the database design

Session 14 & 15:
Lecture
I/O designing
Data capture objectives
Data verification and validation Interactive screen design Design principle of output

Assignment:
Explore the Design principle of input and output
Session 16 & 17:Team Building Team Selection
Team Effort Tracking

Module Name: Software Estimation Techniques Duration: 16 class room hours + 04 Hours lab

Session 1 & 2:
Lecture:
Introduction
Expert
Judgment
Work Breakdown Structure (WBS)
What is the work product
What are the steps

Session 3 & 4:
Lecture:
Algorithmic Cost Model COCOMO Model
Measurement of Software Productivity Measurement of Software Quality Function Point Analysis (FPA)

Session 5 & 6:
Lecture:

System Engineering
Computer-Based Systems
The System Engineering Hierarchy
System Modeling
System Simulation
Business Process Engineering: An Overview
Product Engineering: An Overview
Requirements Engineering

Session 7 & 8:
Lecture:
Object Oriented Techniques Object-Oriented Concepts
Classes and Objects
Attributes
Operations, Methods, and Services Messages
Encapsulation, Inheritance, and Polymorphism

Assignment – Lab:

Assignments Based on the Object-Oriented Concepts

Module Name: Information security Duration: 20

class room hours + 10 Hours lab

Session 1 & 2:
Lecture:
History of information System Basics of Information System
The changing nature of Information System Global information system

Assignment Reading:
Explore the Information System

Session 3 & 4:
Lecture:
Threats of Information System Threats and attacks
Computer viruses
Classification of Threads and attacks Protecting Information System Security

Session 5 & 6:
Lecture:
Security in mobile and Wireless Computing
Credit Card frauds in mobile and wireless Computing Registry settings for mobile settings
Authentication service security
Organizational security policies and measures in mobile computing

Assignment Reading:
Describe the mobile and Wireless Computing

Session 7 & 8:
Lecture:
Security Policies and Measures in Mobile Computing Information Security Management system (ISMS) Organizational responsibility for ISMS
Security Policy, Standards maintenance

Session 9 & 10:
Lecture:
Basic principles of information
security Information classification
Introduction to information security risk analysis
Risk management and risk analysis
Auditing perspective on information security risk analysis
Assignment Reading:
Explore the principles of information security

Module Name: Testing Tools

Duration: 28 Class room hours + 12 Hours

Session 1:
Lecture
Introduction to Automation Testing – What is Testing,
Its need Automation Vs Mannual
Benefits of Automation
Types of Test case Management Tools, Automation Tools, Defect Management Tools Assignment – Reading:
Read and understand Chapters for the next session

Session 2:
Lecture
Introducing Testing:
Provides you with an overview of the Test Director workflow and familiarizes you with the Test Director user interface.
Rational Rose:
Shows you how to create a master test plan based on your goals, resources, and time constraints.

Assignment – Reading:
Exploring the Test Director Window,Tools
Read and understand Chapters for the next session

Session 3:
Lecture
Creating a New Project
Shows you how to create a new database and customize it to meet the requirements of your application.
Creating a Test Plan
Shows you how to analyze the sample application and break it down into subjects. It also helps you builda test plan tree that represents thehierarchical relationship of the subjects.

Assignment – Reading:
Create a new database Analysis a sample application
Read and understand Chapters for the next session

Session 4:
Lecture

Designing Tests

Shows you how to define test steps. It also helps you decide whether to automate a test or perform it manually.

Running Tests

Shows you how to organize test execution by building test sets, and how to execute manual and automated tests.

Assignment – Reading:

Design test cases,execute this test cases and explore it. Read and understand Chapters for the next session

Session 5:
Lecture

Tracking Defects

Shows you how to report and track defects detected in an application

Assignment – Reading:

Track Defects

Read and understand Chapters for the next session

Session 6:
Lecture
Introducing Win Runner
Compares automated and manual testing methods. It introduces the Win Runner testing process and familiarizes you with the Win Runner userinterface

Setting Up the GUI Map
Explains how Win Runner identifies GUI (Graphical User Interface) objects in an application and describes the two modes for organizing GUI map files.

Assignment – Reading:

Exploring the win runner window,
Choosing a GUI map mode,using the rapid test scrip wizard Read and understand Chapters for the next session

Session 7:
Lecture
Checking GUI Objects
Shows you how to create a test that checks GUI objects. You will use the test to compare the behavior of GUI objects in different versions of the sample

application.

Checking Bitmaps
Shows you how to create and run a test that checks bitmaps in your application. You will run the test on different versions of the sample application and examine any differences, pixel by pixel.

Assignment – Reading:
Adding GUI checkpoints to a test scripts, Adding bimaps checkpoints to a test script,
Read and understand Chapters for the next session

Session 8:
Lecture
Programming Tests with TSL
Shows you how to use visual programming to add functions and logic to your recorded test scripts

Creating Data-
Driven Tests Shows you how to run a single test on several sets of data from a data tab Assignment – Reading:
Adding logic to test script, Debugging the test script Adding data t data table,
Running the test and analysis result,
Read and understand Chapters for the next session

Session 9:
Lecture
Reading Text
Teaches you how to read and check text found in GUI objects and bitmaps.

Creating Batch Tests
Shows you how to create a batch test that automatically runs the tests you created in earlier lessons.

Assignment – Reading:
Verifing test,
Analysis the Batch Test result,
Read and understand Chapters for the next session

Session 10:
Lecture
Maintaining Your Test Scripts
Teaches you how to update the GUI object descriptions learned by Win Runner, so that you can continue to use your test scripts as the application changes

Assignment – Reading:
Adding GUI object to the GUI map, Updating the GUI map

with the run wizard Read and understand Chapters.

Session 11:

Lecture

QTP

Introducing Quick TestPro, Recording tests,running and analyzing tests

Assignment – Reading:

Exploring the QTP windows, Hands on test recording

Read and understand Chapters.

Session 12:

Lecture

Data Driven Testing, Batch Testing

Data Driven Batch Testing, Start Transaction and End Transaction

Assignment – Reading:

Hands on batch testing

Read and understand Chapters.

Session 13: Lecture

Load Runner

Introduction to performance tool, Virtual User Generator Transaction

Assignment – Reading:

Exploring Load runner window Read and understand Chapters.

Session 14:

Lecture

Parameterization, Checkpoints, Web Transactions

Assignment – Reading:

create check points

Read and understand Chapters

Module Name: Project Management Tools Duration:

20 class room hours + 20 Hours lab

Session 1 & Session 2:
Lecture:
Introduction to project planning and management Build a work-plan from activity data
Display work-plan in graphical form Spreadsheet Solutions
Management information system (MIS)

Session 3 & Session 4:
Lecture:
Cost and benefit Analysis Detailed Life Cycle of the Project Schduling
What is PERT Chart compute schedules

Session 5 & Session 6:
Lecture:
What is GANTT Chart Simple GANTT Chart
Complex GANTT Chart

Session 7 & Session 8:
Lecture:
Activity graph CPM Analysis
Time Estimates for Activities

Session 9 & Session 10:
Lecture:
Project planning software MS Project Overview
Maintain a database of activity data with input tools Calculate and display schedules
Provide progress reports

Module Name: Software Configuration Management Duration:

Duration: 20 class room hours + 20 Hours lab

Session 1 & Session 2:
Lecture:
Introduction
Software configuration management Background
The purpose and benefits of SCM SCM activities
Configuration identification Configuration control Configuration

status accounting

Assignment – Reading:
Describe the Software Configuration control

Session 3 & Session 4:
Lecture:
Software Versioning Introduction
Software Versioning format Configuration audits
SCM planning Automation of SCM

Assignment – Reading:
Describe the Software Versioning

Session 5 & Session 6:
Lecture:
Automating SCM activities Common features of SCM tools
Lenses for the analysis
Current state of agile software development methods Overview of agile software development
Shared characteristics
Adaptive Software Development Crystal family of methodologies

Session 7 & Session 8:
Lecture:
Dynamic Systems Development Method Extreme Programming
Feature Driven Development Internet-Speed Development SCM approach
SCM planning

Session 9 & Session 10:
Lecture:
Configuration identification Change management
SCM tools
Type of SCM tools

Assignment – Reading:
Describe the following tools- SCM Anywhere
FinalBuilder BuildForge PureCM
Automated Build Studio

Module Name: Introduction to Six Sigma Concepts

Duration: 20 class room hours + 20 Hours lab

Session 1 & Session 2: Lecture:
Introduction
Principal and language of six sigma Essentials of six sigma
History of Six Sigma Problem solving

Assignment – Reading:

Apply Principles & Concepts, & Reap Results during the Course

Session 3 & Session 4: Lecture:
Basic statistics and displays of data
Process mapping and measurement techniques Team-Based, Knowledge-Driven Work Systems
Total Productive Maintenance and Standardized Support Value Streams
Material Flow

Session 5 & Session6: Lecture:
Six sigma tools
Six sigma practitioner tool Six sigma manager tool

Assignment – Reading:
Describe the difference between practitioner and manager tool

Session 7 & Session 8: Lecture:
Establish customer requirements
Measure and quantify process performance
Statistical and other analytical methods for identifying and understanding sources of variation

Session 9 & Session 10: Lecture:
Measurement Systems Analysis
Implementing a Continuous Improvement System Project Management Techniques

Assignment – Reading:
Explore the design for six sigma

Module Name: Quality management system

Duration: 20 class room hours + 10 Hours lab

Session 1 & Session 2: Lecture:
Quality Concepts Quality
Quality Control Quality Assurance Cost of Quality Quality and its needs

Assignment Reading:
Describe the difference between Quality Metrics and Quality Costs in your words.

Session 3 & Session 4: Lecture:
The ISO 9000 Quality Standards
The ISO Approach to Quality Assurance Systems The ISO 9001 Standard
ISO 9001:2008 and ISO 19011 the process aspect

Assignment Reading:
CMMI Model, ISO 9001: 2000 standard

Session 5 & Session 6: Lecture:
The Quality Movement Software Quality Assurance Background Issues
SQA Activities

Session 7 & Session 8: Lecture:
How to plan for an audit and performing an audit Quality Manual
The role of the checklists
Organizing an opening meeting and closing meeting Recording non-conformities
Preparing Auditing reports Evaluating corrective action Continuing assessment

Assignment Reading:
Describe the audit and how to Preparing Auditing reports

Session 9 & Session 10:

Lecture:
Formal Technical Reviews The Review Meeting
Review Reporting and Record Keeping

List of Text Books:

Module Name	Courseware Book	Author / Publication	Edition	ISBN
Introduction to IT Project Management	Software engineering: A practitioner approach	Pressman/ TMH	6th	0071240837
Software Development Life Cycle				
Software Estimation Techniques				
Project Management Tools	Foundation of Computers	P. K. Sinha/BPB	2010	9788176566636
Software Configuration Management				
Introduction to Six Sigma Concepts				
Quality management system				
Information security	Information Security	Khare / BPB Publications		8183331742
Testing Tools	Provided by faculty			

List of references book:

Module Name	References Book
Introduction to IT Project Management	1. Project Management : JumpStart by Heldman 2. Exam Cram 2: PMP by Francis
Software Development Life Cycle	3. 1. Fundamentals of Software Engineering by Rajib Mall
Software Estimation Techniques	4. 1. Software Engineering & Quality Assurance by ISTE
Project Management Tools	5. 1. Project Management Tool Kit by Tom Kendrick
Software Configuration Management	6. Test Case by Dixon, Franklin W 7. Software Testing by by Patton, Ron/techmedia
Introduction to Six Sigma Concepts	8. Six Sigma Advanced Tools Pocket Guide by Rath 9. Six Sigma by Harry Mikel J Schroeder, Richard
Quality management system	10. Quality Management by Goetsch and Davis, And Davis
Information security	11. Information Security: Principles and Practice by 12. Stamp

Evaluation Guidelines:

The marks allotted to each module are directly dependent on the duration for which it is being conducted, though some exceptions are present. For example if the module requires 10 hours of theory (i.e. one week) then the maximum marks allotted for that particular module will be 50.

The evaluation of the students for each module is based on the following distribution of the marks:

Sr. No.	Part of the Module	Marks (in %age)
1	Theory	50
2	Practical	40
3	Assignments	10

Assessment of the students for a particular module will be done on the weekly basis and the final assessment will be done by summing up the performance of the student during each weekly evaluation. The final assessment will be carried out according to the split-up given in the above Table.

According to the criteria mentioned above, the split-up of marks for all modules of Certificate course in quality insurance is given in following Table:

Sr. No.	Module Name	No. of hrs	Theory	Lab	Internal	Total Marks
1.	Introduction to IT Project Management	20	50	-	-	50
2.	Software Development Life Cycle	60	50	-	-	50
3.	Software Estimation Techniques	20	50	-	-	50
4.	Information security	30	50	-	-	50
5.	Testing Tools	40	50	40	10	100
6.	Project Management Tools	40	50	40	10	100
7.	Software Configuration Management	40	50	-	-	50
8.	Introduction to Six Sigma Concepts	40	50	-	-	50
9.	Quality management system	30	50	-	-	50
	Total	320				550

Requirements (S/W and H/W):

Software:

Microsoft Windows XP/Vista
Business Windows 2003
Enterprise Server
SQL Server 2005
Microsoft .Net 3.5 (2008)
Ms Office 2003
Testing tools: QTP, Test Director, Load Runner, Win runner, Rational Rose

Hardware:
Intel Core 2 Duo E6550 CPU
2.33GHz, 4MB L2 Cache,
4GB DDR2 RAM 667MHz,
250GB 7200 RPM SATA Hard Disk
Key board
Mouse

Recommendations:

Students may be provided with enough literature in the form of various Engineering Journals & various magazines relevant to software engineering so that the students get acquainted to the current trends in the evolving technologies. If possible students should be exposed to OOPS Concepts. The students can carry out the study of C on their own and if possible the faculty may provide the students with some assignment for C during the break period. Some initial lectures can be conducted to boost them for learning C. Apart from providing the technical knowledge it is recommended that some guidance on the personality development should also be introduced to create a confidence in him/her while facing Interviews.