

# **Introduction to Software Development Methodologies**

## **Overview:**

Software development is a process of inventing, improving, and selecting among alternative solution, and then describing computer programs that meet user requirements within the constraints of the environment and based on relevant criteria. A good software design is one that describes a system that will meet all its requirements. The best software design is one that describes a system that will meets and most appropriately balances the requirements, constraints, and criteria.

The purpose of this introductory course is to provide participants with the basics of software development methodologies with emphasis on concepts and techniques of software development forming base for subsequent courses.

## **Topics to be covered:**

- Software Development Environment
- Basics of Software Engineering
- Introduction to Information Engineering
- Software Development lift cycle
- Basic Software Design Issues
- Software Development Tools
- Automating Software Development Through CASE Tools
- Managing Software Development Projects

## **Duration:**

2 Days

## **Pre-Requisites:**

Non

## **Process Modeling: Concepts and Tools**

### **Overview:**

Process modeling involves graphically representing the functions, or processes, which capture, manipulate, store, and distribute data between a system and its environment and between components within a system. The purpose of this course is to provide participants with the basics concepts and tools of process modeling.

### **Topics to be covered:**

- Basic concepts of process modeling
- Deliverables and outcomes
- Data flow diagramming
- Using data flow diagramming in the analysis process
- Automated tools for process modeling
- Case studies

### **Duration:**

3 days.

### **Pre-requisites:**

Introduction to Software Development Methodologies.

## **Data Modeling: Concepts and Tools**

### **Overview:**

Data modeling is a representation of organizational data. The purpose of data model is to show as many rules about the meaning and interrelationships among data as are possible.

The purpose of this course is to provide participants with the basic concepts and tools of data modeling.

### **Topics to be covered:**

- Basic concepts of data modeling
- Deliverables and outcomes
- Conceptual data modeling
- Entity relationship modeling
- Business rules
- Logical data modeling
- Automated tools for data modeling
- Case studies

### **Duration:**

3 Days

### **Pre-requisites:**

Introduction to Software Development Methodologies.

## **Software Design (I)**

### **Overview:**

The purpose of design is to create a solution that best meets the criteria for the software. The purpose of a method is to help the designer to achieve a good design. A complete software design method includes criteria for choosing between various Design alternatives; these criteria help designers to meet software design objectives.

This course is concentrated on the logical design aspects of software design with emphases on designing: forms, reports, interfaces and logical databases.

### **Topics to be covered:**

- Basic concepts of software logical Design
- Logical Design deliverables and outcomes
- Designing Forms
- Designing Reports
- Designing Interfaces
- Interactive methods
- Controlling user Access
- Designing Dialogues
- Designing Databases
- Concepts of Normalization
- Merging Relations

### **Duration:**

3 Days

### **Pre-Requisites:**

Data Modeling: concepts and Tools

## **Software Design (II):**

### **Overview:**

This course is continuation of the course **software Design (I)**. This course is concentrated on the physical design aspects of software development with emphasis on: Designing physical files and databases; Designing system and program structure; and Designing distributed processing strategies.

### **Topics to be covered:**

- Basic concepts of software physical design
- Physical Design deliverables and outcomes
- Designing physical files and databases
- Designing the internals
- Program and process design
- Designing distributed systems
- Designing systems for client/server Architecture
- Designing systems for Multi-tiers Architecture
- Managing Data in distributed systems
- Web enabled design

### **Duration:**

3 Days

### **Pre-Requisites:**

Software Design (I)

## **Software Quality Assurance and Testing**

### **Overview:**

Software Quality is the explicitly stated functional and performance requirements, explicitly documented development standards, and implicit characteristics that are expected of all professionally developed software. Software testing is essential in confirming that the system satisfies and operating properly according to desired requirements.

The main objectives of this course are to provide participant with the basic concepts, techniques, tools, and methodologies for software Quality assurance and testing.

### **Topics to be covered:**

- Basics of Software Quality
- Software Quality factors
- Grading metrics
- Software Quality Assurance plan and activities
- Software Reviews
- Reviews checklists
- Software verification and validation
- Testing principles
- Test plan
- Different types of tests
- Testing standards
- Software test documentation

### **Duration:**

3 Days

### **Pre-Requisites:**

Introduction to Software Development Methodologies.