

NEW  
SYLLABUS



# *Software Engineering*

*Umakant S. Shirshetti*

A Text Book of

# SOFTWARE ENGINEERING

FOR

M.C.A. : MANAGEMENT : SEMESTER - I  
SUBJECT CODE : IT 13

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**MY FATHER  
LATE SHIVSHARANAPPA S. SHIRSHETTI  
AND  
MY MOTHER  
LATE LAXMIBAI S. SHIRSHETTI**

**Umakant Shirshetti**



## PREFACE

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There has been significant development in recent years in the field of Computer Science. The book is a perfect blend of technology which has been a field of dramatic revolution; this subject focuses on different technologies of it.

It gives me great pleasure in presenting this book "**Software Engineering**" designed to serve as a textbook for students of the First Semester of Master of Computer Application (M.C.A.). The book is organized in such a way that it mirrors the revised syllabus of University of Pune. The book will be found useful by a wide section of readers, teachers and students of Business, Technology and Computer Management courses in Indian Universities. The entire book is freshly written as per the Pune University revised syllabus.

The book has its own unique features. It brings out the subject in a very simple and lucid manner for easy and comprehensive understanding of the basic concepts, its intricacies, procedures and practices. This book will help the readers to have a broader view on Software Engineering. The language used in this book is easy and will help students to improve their vocabulary of Technical terms and understand the matter in a better and happier way.

Particular attention has been paid to making this book stimulating and highly readable. The result is a text which is clear, focused and designed to capture student interest. This text is equally suitable for courses directed at undergraduates and postgraduates.

I have given my best inputs for this book. Any suggestions towards the improvement of this book and sincere comments are most welcome on [niralipune@pragationline.com](mailto:niralipune@pragationline.com)

**Umakant Shirshetti**



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I thank Mr. Amar Salunkhe for his important inputs time to time. Mrs. Deepa Sawant painstakingly attended to all the details to make this book appear good.

I am also grateful to all the staff members of Nirali Prakashan, who were involved in the publication of this book.



# SYLLABUS

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## **1. Overview of systems Analysis and design**

- 1.1 Basic System Development Life Cycle
- 1.2 Different approaches and models for System Development:
  - Waterfall
  - Prototyping
  - Spiral (including WIN-WIN Spiral)
  - RAD
- 1.3 Group Based Approach: JAD
- 1.4 Role & Skills of system Analyst

## **2. Software Requirements Specification Techniques**

- 2.1 Requirements Anticipation
- 2.2 Requirements Investigation
  - Fact finding methods
- 2.3 Requirements Specifications
  - Software requirement Specification (SRS)
  - Structure and contents of the requirements Specification
  - types of requirements - functional and non- functional
  - Quality criteria,
  - requirements definition,
  - IEEE standard SRS format,
  - Fundamental problems in defining requirements

**Case studies on SRS should be covered**

## **3. Information requirement Analysis**

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  - Decision Table,
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- 3.2 Functional Decomposition Diagram
- 3.3 Process modeling with Data Flow Diagrams
- 3.4 Entity Relationship Diagram: Identify Entity & Relationships
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**Case Studies on Decision analysis tools FDDs, DFDs should be covered**

#### **4. Designing of Input, Output and Program**

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Data Capture Guidelines  
Design of Source Document,  
Input Validations

##### 4.2 Design of output

Objectives of Output  
Design Types Of Output

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Elements of good design,  
Design issues

Features of modern GUI, Menus, Scroll bars, windows, buttons, icons, panels, error messages etc.

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**Case studies should be covered on the Topic**

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# Chapter 1 ...

## **OVERVIEW OF SYSTEM ANALYSIS AND DESIGN**

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### Contents...

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  - 1.1.1 System Definition
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    - 1.1.1.2 Elements of System
    - 1.1.1.3 Types of System
  - 1.1.2 Overview of Software and Software Engineering
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- 1.3 Different Approaches and Models for System Development
  - 1.3.1 Waterfall Model
  - 1.3.2 RAD Model
  - 1.3.3 Prototyping Model
  - 1.3.4 Spiral Model
- 1.4 Group Based Approach: (JAD)
- 1.5 System Analyst
  - 1.5.1 Role of System Analyst
  - 1.5.2 Skills of System Analyst
    - Practice Questions

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### **1.1 Introduction to System and System Analysis and Design**

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- We are surrounded by systems. There are many systems such as transportation system, the distribution of goods and services, education, manufacturing and almost every other human economic activity.
- From conceptual point, we can view the economy and business as a set of interrelated systems. System analysis and design focuses on systems processes and technology.
- **System is defined as a set of elements arranged in an orderly manner to accomplish an objective.**
- A collection of component that work together to realize some objectives forms a system. In a system the different components are connected with each other and they are interdependent.

(1.1)

- For example, human body represents a complete natural system. We are also bound by many natural systems such as political system, economic system, educational system and so forth.
- System analysis may be understood as a process of collecting and interpreting facts, identifying problems and using the information to recommend improvements in the system.
- In other words system analysis means identification, understanding and examine the system for achieving predetermined goals/objectives of the system.
- System analysis is carried out with the following two objectives:
  1. To know how a system currently operates, and
  2. To identify the users requirements in the proposed system.
- System analysis and design is used to analyze, design and implements in the support of users and the functioning of business that can be accomplished through the use of computerized information system.
- **A system is a set or group of components that interact to accomplish some purpose.** System around us.
- For example, complex nervous system which is made up of set of parts or components i.e. brain, spinal cord, nerves etc.
- System means set of connected things that works together. It is derived from a greek word 'systema' which means relationships in functional units.
- We can define the system as "**system is a orderly grouping of interdependent components linked together according to the plan to achieve the specific goal**".
- There are various objectives available for system. Some of them are listed below:
  1. System must be designed to achieve remind objective (goal).
  2. Inter-relationship dependency must exists among the components of the system.
  3. Objective of an organization as a whole have higher priority than the objective of the subsystem.

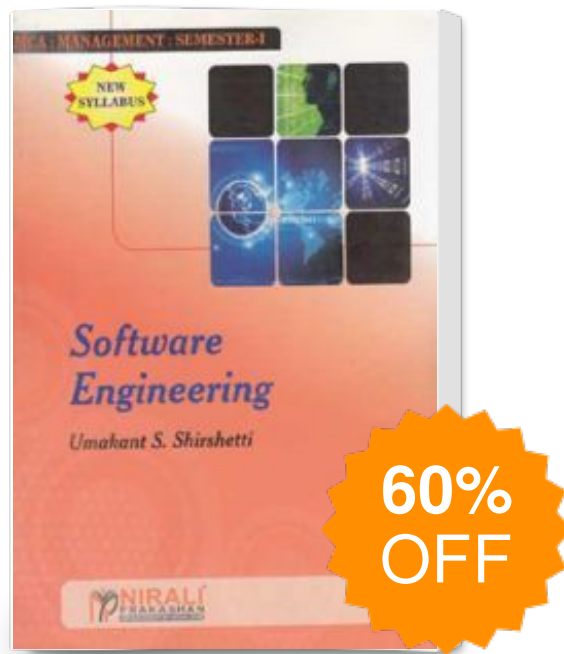
### 1.1.1 System Definition

- A system can be defined as a network of interrelated procedures that are joined together to perform an activity or to accomplish a specific objective.

OR
- A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective.

OR
- System is a set of components that interact with other components to accomplish specific goal.

# Software Engineering



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