

6.3 SOFTWARE ENGINEERING

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RATIONALE

The system analysis and design is the backbone of Application software development. After studying the subject the students will be able to develop and design the system according to given requirements. It involves various steps in analysis and design of the system. It includes the knowledge of preparing project systematically.

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

CO1: Learn about different types of systems.

CO2: Study various life cycle models.

CO3: Describe software requirement specifications.

CO4: Explain characteristics and features of good Software.

CO5: Define the concept of software testing and verification.

DETAILED CONTENTS

UNIT I

INTRODUCTION TO SOFTWARE ENGINEERING

Concept of systems: Types of systems: open, closed, static and dynamic systems.

Introduction, Programmes v/s Software Products

Emergence of Software Engineering- Early Computer Programming, High-level Language Programming, Control flow based Design, Data Structure Oriented Design, Object Oriented Design.

UNIT II

SOFTWARE LIFE CYCLE MODELS

Iterative Model, Requirement of Life Cycle Model, Classic Waterfall Model, Prototyping Model,

Evolutionary Model, Spiral Model, Introduction to Agile Model.

Comparison of different Life Cycle Models.

UNIT III

SOFTWARE PLANNING

Responsibilities of Software Project Manager

- Metrics for Project Size Estimation- LOC (Lines of Code), Function Point Metric

- Project estimation Techniques- Using COCOMO Model.

Software Requirement Specifications (SRS), Characteristics of good SRS

UNIT IV

SOFTWARE DESIGN AND IMPLEMENTATION

Characteristics and features of good Software Design Cohesion and Coupling, Software design Approaches- Function Oriented Design (Data flow diagrams, Data dictionary, Decision Trees and tables), Object Oriented Design, Structured Coding Techniques, Coding Styles, documentation.

UNIT V

SOFTWARE TESTING

Concept of Testing, Verification v/s Validations, Unit Testing, Black Box Testing, White Box Testing, Integration testing, System testing, Introduction to Configuration Management.

RECOMMENDED BOOKS

1. Software Engineering by Rajib Mall, PHI Publishers, New Delhi.
2. An Integrated Approach to Software Engineering by Pankaj Jalote, Narosa Publishing. House Pvt Ltd, Darya Ganj, New Delhi 110002.
3. Software Engineering, Sangeeta Sabharwal, New Age International, Delhi.
4. Software Engineering by KK Aggarwal and Yogesh Singh.
5. Software Engineering – A Practitioner’s Approach by RS Pressman, Tata McGraw Hill Publishers, New Delhi.
- 6 e-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

RECOMMENDED WEBSITES

1. <https://swayam.gov.in/>

INSTRUCTIONAL STRATEGY

This is theoretical subject and contains five units of equal weightage.