**DETAILED SYLLABUS**

**UNIT - I INTRODUCTION TO SOFTWARE ENGINEERING 10 HOURS**

1.1 **Basics of Software Engineering :** Need for Software Engineering – Definition – Software Characteristics – Software Myths – Program versus Software Products

1.2. **Software Development Life Cycle Models:** Introduction –- Waterfall Model – Prototyping model – Spiral Model – Iterative Enhancement model - RAD model – Object Oriented Model - Advantages and Disadvantages of above models – Comparison of various models.

1.3 **Software Requirement Analysis ( SRS) :** Value of good SRS – Requirement Process – Requirement Specification – Desirable characteristics of an SRS – Components of an SRS – Structures of a requirements documents - Problems in SRS – Requirements gathering

**UNIT – II SOFWARE DESIGN & PLANNING 10 HOURS**

2.1 **Software Design** : Definition of software design – Objectives of software design – Process of software design – Architectural design – Modular design – Structure chart – Coupling and Cohesion – Different types – Interface design – Design of Human Computer Interface

2.2 **CODING:** Information Hiding – Programming style – Internal documentation – Monitoring and Control for coding – Structured

2.3. **Software Planning:** Software metrics - Definition – Types of metrics – Product and Project metrics – Function point and feature point metrics – Software project estimation – Steps for estimation – Reason for poor and inaccurate estimation – Project estimation guidelines – Models for estimation – COCOMO Model – Automated tools for estimation.

2.4. **CASE :** CASE and its scope – Architecture of CASE environment – Building blocks for CASE – CASE support in software Life cycle – Objectives of CASE – Characteristics of CASE tools – List of CASE tools – Categories, advantages and advantages of CASE tools.

**UNIT – III SOFTWARE MAINTENANCE AND RISK MANAGEMENT 10 HOURS**

3.1. **Software Maintenance:** Software as an evolution entity – Software configuration management activities – Change control process – Software version control – Software configuration management – Need for maintenance – Categories of maintenance – Maintenance cost – Factors affecting the effort

3.2. Risk Management: Definition of Risk - Basics for different types of software risks – Monitoring of risks – Risk management – Risk avoidance – Risk detection – Risk control – Risk recovery – Sources of risks – Types of risks

3.3. **Project scheduling** : Introduction – Factors affecting the task set for the project – scheduling methods – Work breakdown structure – Flow graph – Gant chart - PERT

**UNIT – IV SOFTWARE TESTING 10 HOURS**

4.1. **Software Testing :** Introduction to testing – Testing principles – Testing objectives – Test Oracles - Basic terms used in testing – Fault – Error – Failure - Test cases – Black box and white box testing – Advantages and disadvantages of above testing – Methods for Block box testing strategies – Methods for white box testing strategies – Testing activities – Test plan.

4.2. **Levels of testing: Unit testing - Integration tests – System testing – Types.**

4.3. **Software Testing strategies:** Static testing strategies – Formal technical reviews – Code walkthrough – Code inspection - Debugging – Definition – Characteristics of bugs – Life cycle of a Debugging task – Debugging approaches.

4.4 **Software Testing Tools:** Need for tools – Classification of tools – Functional/Regression Testing tools – Performance/Load Testing Tools – Testing process management Tools – Benefits of tools – Risk Associated with tools – Selecting tools – Introducing the tool in the testing process - Different categories of tools – Examples for commercial software testing tool.

4.5 **Code of Ethics for Software Professionals:** Human Ethics – Professional Ethics – Ethical issues in Software Engineering – Code of Ethics and professional Practice: Software Engineering code of ethics and professional Practice – Ethical issues: Right versus Wrong

**UNIT – V SOFTWARE RELIABILITY AND QUALITY ASSURANCE 10 HOURS**

5.1. **Software Quality Assurance :** Verification and validation – SQA - Objectives and Goals – SQA plan - Definition of software quality – Classification of software qualities - Software quality attributes – Important qualities of software products - Importance of software quality – SEI – CMM - Five levels - ISO 9000 – Need for ISO Certification – Benefits of ISO 9000 certification – Limitation of ISO 9000 certification – Uses of IS ISO - Salient features of ISO 9000 Requirements – Introduction to ISO 9126

5.2 **Software Reliability :** Definition – Reliability terminologies – Classification of failures – Reliability metrics – Reliability growth modeling - Reliability measurement process

5.3 **Reverse Software Engineering:** Definition – Purpose - Reverse engineering Process – Reverse engineering tasks – Characteristics and application areas of reverse engineering – Software re-engineering – Principle – Re- engineering process – Difference between forward engineering and re-engineering

**REFERENCES:**


| S. No | TITLE | AUTHOR | PUBLISHER | Year of Publishing / Edition |
|---|---|---|---|---|
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| 2. | Fundamentals of Software Engineering | Rajib Mall | PHI Learning Pvt Limited, New Delhi | 28th Printing – August 2011 |
| 3. | Software Engineering | Bharat Bhusan Agarwal, Sumit Prakash Tayal | Firewall Media, New Delhi | Second Edition 2008 |
| 4. | Software Testing | K.Mustafa and R.A.Khan | Narosa Publishing House, New Delhi | Reprint 2009 |
| 5. | Software Quality | R.A. Khan, K.Mustafa and SI Ahson | Narosa Publishing House, New Delhi | Reprint 2008 |
| 8. | Software Engineering | Stephen Schach | TMGH Education Pvt Ltd, New Delhi | Eight Reprint 2011 |
| 7. | Software Engineering fundamentals | Ali Behforooz and Fredick J Hudson | Oxford University press, | 2005 |
| 8. | Software Testing Principles and Practices | Srnivasan desikan, Gopalswamy Ramesh | Pearson | First Edition |
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| 10. | Software Engineering Concepts and application | Subhasjit Dattun | OXFORD University Press | 2010 |
| 11. | Software Engineering | Rohit Khurana | Vikas Publishing | Second Edition |