



**BONAM VENKATA CHALAMAYYA INSTITUTE OF
TECHNOLOGY AND SCIENCE (A) :: BATLAPALEM, Andhra
Pradesh, India**

**MCA Course Structure & Syllabus
(Applicable for batches admitted from 2025-2026)**

**MCA II Semester
Course code : 25MC2T09**

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SOFTWARE ENGINEERING

Course Objectives:

To understand the nature of software development and software life cycle

- models. To understand methods of capturing, specifying, visualizing and
- analyzing software requirements. To know the basics of testing and understanding the concept of software
- quality assurance and software configuration management process. To learn to provide correctness proofs for algorithms

UNIT-I:

Introduction: Software Engineering and its history, Software crisis, Evolving of a Programming System Product, Characteristics of Software, Brooks' No Silver Bullet, and Software Myths. Software Development Life Cycles : Software Development Process, Code-and-Fix model, Waterfall model, Evolutionary Model, Incremental Implementation, Prototyping, Spiral Model, Software Reuse, Critical Comparisons of SDLC models. An Introduction to Non-Traditional Software Development Process: Rational Unified Process, Rapid Application Development, Agile Development Process Introduction, Agile- SCRUM(Sprint, Review, Retrospective, Planning), XP, KANBAN, SAFE agile

UNIT-II:

Requirements: Importance of Requirement Analysis, User needs, Software Features and Software Requirements. Classes of User Requirements: Enduring and Volatile, Sub phases of Requirement Analysis, Functional and Non-functional requirements, Barriers to Eliciting User requirements, The software requirements document and SRS standards, Requirements Engineering, Case Study of SRS for a Real Time System. Tools for Requirements Gathering: Document Flow Chart, Decision Table, Decision Tree, Introduction to non-traditional Requirements.

UNIT-III:

Software Design: Goals of good software design, Design strategies and methodologies, Data oriented software design. Structured Design: Structure chart, Coupling, Cohesion, Modular structure, Packaging, Object oriented design, Top-down and bottom-up approach, Design patterns. Structured Analysis: DFD, Data Dictionary, Software Measurement and Metrics: Various Size Oriented Measures: Halstead's software science, Function Point (FP) based measures, Cyclomatic Complexity Measures: Control flow graphs Development: Selecting a language, Coding guidelines, Writing code, Code documentation

UNIT-IV:

Software Testing :Testing process, Design of test cases, Functional Testing : Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing, Path testing, Data flow and mutation testing, Unit testing, Integration and system testing, Debugging, Alpha & beta testing, testing tools & standards.

University Nominee Dr.Suneetha Eluri		Alumni Member Mr.HariSuresh Polisetti	
SubjectExpert:1 Dr. B Kezia Rani		Chairman Mr. AVS M Ganesh	
SubjectExpert:2 Dr.SuneelKumarDuvvuri		Member Mr. G L N V S Kumar	
Representative From Industry Mr.SaiKrishna Narima		Member	



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UNIT-V:

Software Maintenance: Management of maintenance, Maintenance process, Maintenance models, Regression testing, Reverse engineering, Software reengineering, Configuration management, documentation.

Text Books:

1. Software Engineering: A Practitioner's Approach, R. S. Pressman, McGraw Hill, 9th Edition, Sept 2019

Reference Books:

1. Software Engineering K.K. Aggarwal, Yogesh Singh, New Age International Publishers, Third Edition, 2007
2. Software Engineering, Ian Sommerville, Addison Welsley, 9th Edition, 2010.
3. An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa Publishing House, 3rd Edition, 2007

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc23_cs122/preview
2. <https://nptelvideos.com/course.php?id=444>
3. <https://softengbook.org/>
4. <https://www.coursera.org/learn/introduction-to-softwareengineering?msocid=39a584c9c8ac6773281697f5c91e6633>

University Nominee Dr. Suneetha Eluri		Alumni Member Mr. Hari Suresh Polisetti	
Subject Expert:1 Dr. B Kezia Rani		Chairman Mr. AVS M Ganesh	
Subject Expert:2 Dr. Suneel Kumar Duvvuri		Member Mr. G L N V S Kumar	
Representative From Industry Mr. Sai Krishna Narima		Member	