

MCA 209: Advanced Software Engineering

Teaching Scheme

Lectures: 3 hrs/Week
Tutorials: 1 hr/Week

Credits: 4

Examination Scheme

Class Test - 12 Marks
Teachers Assessment - 6 Marks
Attendance - 12 Marks
End Semester Exam - 70 marks

Prerequisite: -

1. Familiarity with the fundamentals of system analysis and design
2. Basic terminologies used in software development.

Course Objectives:

1. It aims to develop a broad understanding of the discipline of software engineering.
2. It seeks to complement this with a detailed knowledge of techniques for the analysis and design of complex software intensive systems.
3. It aims to set these techniques in an appropriate engineering and management context.

Detailed Syllabus

UNIT I (10 Hours)

Introduction to Software and Software Engineering: Software Characteristics and Applications, Software Engineering a Layered Technology, Software Process.

UNIT II (10 Hours)

Software Life Cycle Models: Classical Waterfall Model, Iterative Waterfall Model, Prototyping Model, Evolutionary Model, RAD Model, Spiral Model, Agile Software Development Model, Comparison of different Life Cycle Models.

UNIT III (10 Hours)

Software Project Management: Project Planning, Project size estimation-LOC and FP Metric, Project Estimation Technique-COCOMO Model, Project Scheduling-WBS, Gantt chart, PERT Chart, Activity Network and Critical Path Method, Risk Management, Software Configuration Management.

UNIT IV (10 Hours)

Requirement Engineering: Requirement Gathering, Requirement Analysis-ERD, DFD, Data Dictionary, Decision Tree, Decision Table, SRS Document, Characteristics of good SRS Document, SRS Verification and Validation.

UNIT V (6 Hours)

Software Design: Characteristics of good Software Design, Cohesion and Coupling. Function Oriented Design: Structured Analysis. Object Oriented Design: OOPS Concepts, UML and USE Case Model.

UNIT VI (10 Hours)

Testing and Implementation: What is Testing and Debugging, Design of Test Cases, Unit Testing, Integration Testing, White Box and Black Box Testing, System Testing, McCabe's Cyclomatic Complexity, System Testing. Software Reliability Models, SQA, SEI/CMM, CASE. Software Maintenance Models.

Text and Reference Books

1. Software Engineering, Roger S Pressman, Tata McGraw Hill, 6th Edition 2005
2. Fundamentals of Software Engineering, Rajib Mall, PHI, 3rd Edition 1997
3. Software Engineering, I. Sommerville, Pearson Education, 8th Edition 2007
4. Software Engineering Concepts, R Fairley, Tata McGraw Hill, 4th Edition 1997

Head

Department of Computer Applications
Faculty of Computer Applications
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Course Outcomes:

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| 1. Be employed in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility. | |
| 2. Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment. | |
| 3. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics | |
| 4 an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors | |
| 5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives | |
| 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. | |

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