Syllabus

MCA-2105: SOFTWARE ENGINEERING & TESTING
Max. Marks: 80
Time: 3 Hrs.
Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit.
Each question shall carry equal marks.
Learning Objectives:
1. This course will enhance technical skill of students for employment in industry, government, or entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and also expanded leadership responsibility.
2. Demonstrate the ability to work effectively as a team member and/ or leader in an ever changing professional environment.

Unit – I
Software Engineering Paradigms: Software Characteristics, Software myths, Software Application, Software Process Models, Process iteration, Process activities, CASE Tools. Software Project management: Management activities, Project planning, Project scheduling, Risk
management and activities. Software Requirements engineering: Requirements Engineering Process, Phase, Type of software Requirements, Software Requirements specification Document, Specification languages.

Unit – II
Software Metrics and Measures: Process Metrics, Project metrics, Software Project Estimation Models: Empirical, Putnam, COCOMO models. Software Design Process, Principles of software design, Design Strategies, Levels of Software Design, Interface Design, Coding
and Software Reuse. Software Testing, Testability and features of Test cases, Software Reliability, Software Safety, Defect testing, Debugging Tools, Software Testing techniques; WBT, BBT, Ticking Box testing; static analysis, symbolic testing, program mutation testing, input space , partitioning, functional program testing, data flow guided testing.

Unit – III

Software Testing Strategies: Approach, Issues; integration, incremental, System, alpha, Beta testing etc; Comparative evaluation of
techniques: Testing tools; Dynamic analysis tools, test data generators, Debuggers, test drivers etc. Technical Metrics for Software: Quality
Factors, framework; Metrics for analysis, design, testing source code etc. Object Oriented Testing: OOT strategies and issues, Test Case design, interface testing.

Unit – IV

Software Maintenance and its types, S/w Configuration Management, S/w Reuse, Software Evolution, Software Quality Assurance: –
plans & activities, concept, importance and essence; FTR, structured walk through technique etc., Software Documentation, Software Reliability, validation, Software Safety and Hazards Analysis; Features affecting software quality, SQA Plan, Using project management software tools, Quality management, issue, standards and methods, ISO Quality models: ISO 9000 and SEI-CMM and their relevance.

Course Outcomes:

CO1: Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

CO2: 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

CO3: Ability to communicate effectively with a range of audiences

CO4: Discuss about the functional and system testing methods.

CO5: Demonstrate various issues for object oriented testing.

CO6: Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider
the impact of engineering solutions in global, economic, environmental, and societal contexts