SARDAR PATEL UNIVERSITY
Programme: MCA
Semester: IV
Syllabus with effect from: November 2014

Paper Code: PS04CMCA04	Total Credit: 4
Title Of Paper: Software Engineering	

Unit	Description in detail	Weighting (%)
1	**Introduction** Software – meaning and applications Software Engineering – meaning, goal, challenges and approach Software Product – category and characteristics Software Processes and models, desirable characteristics of software process Software Development Process Models – waterfall, prototyping, iterative, timeboxing and spiral. Agile view of process	
2	**Software Requirement Analysis and Specification** Software Requirements – need, process Problem Analysis, Requirement Specifications, Functional Specifications with Use Cases Verification and Validation (V&V), Metrics	
3	**Software Project Management** Process planning, responsibilities of a software project manager Metrics for Project Size estimation Effort estimation, Project Scheduling and Staffing, Work Breakdown Structure (WBS), Software Configuration Management plans, Quality Plan, Risk Management, Project Monitoring Plan	
4	**Software Design** Design – meaning, types, process and quality Design approaches - Function-oriented design (introduction), Object-oriented design Design Concepts – problem partitioning, abstraction, modularity (coupling and cohesion), information hiding, functional independence, refinement, refactoring and design classes Object Modeling using UML – overview of UML, UML diagrams User interface design, characteristics, types and methodology Component-based GUI development	
5	**Coding and Testing** Coding – meaning, process, programming standards and guidelines, refactoring, verification, metrics Testing – meaning, importance and process Testing fundamentals – error, fault, bug, failure, test oracles, test cases and test criteria Black-box (functional) testing - equivalence class partitioning, boundary value analysis, cause-effect graphing, pair-wise testing, special cases, state-based testing White-box (structural) testing – statement coverage, branch coverage, condition coverage, path coverage, McCabe's Cyclomatic Complexity Metric, Data-flow based testing, Mutation testing Defect analysis and prevention Metrics	
6	**Advanced Concepts** Software Reliability and Quality Management Software Maintenance Software Reuse Web Engineering, initiating a Web Application project, Testing for Web Applications Software Re-engineering	

Basic Text & Reference Books

- Roger S. Pressman : Software Engineering, A Practice Approach, 6th Edition, Mc-Graw Hill International Edition, 2005 (ISBN 007-124083-7).
- Jalote Pankaj : Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House, 2005 (ISBN 978-81-7319-702-4).
- Rajib Mall : Fundamentals of Software Engineering, 2nd Edition, Prentice-Hall of India, 2006 (ISBN-81-203-2445-5).
- Ian Sommerville : Software Engineering, 6th edition, Pearson Education, 2001, (ISBN 81 7808-497-X).
- Waman S Jawadekar, Software Engineering Principles and Practice, 1st Edition, Tata McGraw Hill, 2004.