SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

MCA (Master of Computer Applications)
MCA (Master of Computer Applications) Semester II

Course Code	PS02CMCA52	Title of the Course	SOFTWARE ENGINEERING
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	1. To learn development of feasible and reliable software products for solving real life problems. 2. To learn process understanding and flow of process. 3. To acquire skills and knowledge for upgrading analytic, communication and technical skills. 4. To learn the methodology required for software development. 5. To learn the process of improving the quality of software work products.

Course Content		
Unit	Description	Weightage* (%)
1.	**Introduction** – Software – meaning and applications – Software Engineering – meaning, goal, challenges and approach – Software Process – Software Development Process Models – waterfall, prototyping, iterative, time boxing and spiral – Introduction to Agile Computing – Agile Software Development Approaches (Scrum, eXtreme – Programming, Feature Driven Development, Dynamic Driven Development) – Collaborative User Story Creation, Retrospectives, Continuous Integration, Release and Iteration Planning	25
2.	**Software Requirement Analysis and Project Management** – Software Development Life Cycle (SDLC) – Software Requirements Specification (SRS) – Need, Process, Problem Analysis, Requirement Specifications, structure and components, Functional Specifications using Use Cases – Software Project Management : Project Planning, various issues addressed in Project Planning, Effort Estimation – Work Breakdown Structure (WBS)	25

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3.	**Software Design** – Design – meaning, types – Design approaches - function-oriented design (introduction), object-oriented design – Design Concepts for Object-oriented design - information hiding, functional independence, refinement, refactoring and design classes – Object Modeling using UML – Overview, Diagrams – class, sequence, collaboration, use-case, activity, state chart	25
4.	**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 – Introduction to Black-box (functional) testing and White-box (structural) testing – Comparison of Black-box and White-box testing – Alpha testing and Beta testing	25

Teaching-Learning Methodology	Blended learning approach incorporating traditional classroom teaching as well as online / ICT-based teaching practices

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	apply engineering design to produce economical software solutions that satisfy needs of end users.
2.	communicate effectively with stakeholders of software development.

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| 3. | develop and conduct appropriate experimentation, analyze and interpret data. |

Suggested References:	
Sr. No.	References
1.	Jalote Pankaj : Pankaj Jalote's Software Engineering: A Precise Approach, Wiley India Pvt. Ltd. Reprint 2012.
2.	Roger S. Pressman : Software Engineering, A Practice Approach, 6th Edition, Mc-Graw Hill International Edition, Fifth Reprint 2012.
3.	Rajib Mall : Fundamentals of Software Engineering, 2nd Edition, Prentice-Hall of India, 2006.
4.	"Head First Agile", Andrew Stellman & Jennifer Greene, O'Reilly Media Inc., 2017.
5.	Ian Sommerville : Software Engineering, 9th edition, Pearson Education, 2011.
6.	Waman S Jawadekar, Software Engineering Principles and Practice, 2nd Reprint,Tata McGraw Hill, 2008.

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