

Savitribai Phule Pune University Third Year of Computer Engineering (2015 Course) 310243: Software Engineering and Project Management		
Teaching Scheme: TH: 03 Hours/Week	Credit 03	Examination Scheme: In-Sem (Paper): 30 Marks End-Sem (Paper): 70 Marks
Prerequisite Courses: Fundamentals of Programming Languages (110003, 110011)		
Course Objectives: <ul style="list-style-type: none"> To learn and understand the principles of Software Engineering To be acquainted with methods of capturing, specifying, visualizing and analyzing software requirements. To apply Design and Testing principles to S/W project development. To understand project management through life cycle of the project. To understand software quality attributes. 		
Course Outcomes: On completion of the course, student will be able to– <ul style="list-style-type: none"> Decide on a process model for a developing a software project Classify software applications and Identify unique features of various domains Design test cases of a software system. Understand basics of IT Project management. Plan, schedule and execute a project considering the risk management. Apply quality attributes in software development life cycle. 		
Course Contents		
Unit I	Introduction to Software Engineering, Software Process Models	07 Hours
Software Engineering Fundamentals: Nature of Software, Software Engineering Principles, The Software Process, Software Myths. Process Models : A Generic Process Model, Prescriptive Process Models: The Waterfall, Incremental Process(RAD), Evolutionary Process, Unified Process, Concurrent. Advanced Process Models & Tools: Agile software development: Agile methods, Plan-driven and agile development, Extreme programming Practices, Testing in XP, Pair programming. Introduction to agile tools: JIRA, Kanban, Case Studies: An information system (mental health-care system), wilderness weather system		
Unit II	Software Requirements Engineering& Analysis	08 Hours
Requirements Engineering: User and system requirements, Functional and non-functional requirements, Types & Metrics, A spiral view of the requirements engineering process. Software Requirements Specification (SRS): The software requirements Specification document, The structure of SRS, Ways of writing a SRS, structured & tabular SRS for an insulin pump case study, Requirements elicitation & Analysis: Process, Requirements validation, Requirements management. Case Studies: The information system. Case study - Mental health care patient management system (MHC-PMS).		
Unit III	Design Engineering	08 Hours
Design Process & quality, Design Concepts, The design Model, Pattern-based Software Design. Architectural Design : Design Decisions, Views, Patterns, Application Architectures, Modeling Component level Design: component, Designing class based components, conducting component-level design, User Interface Design: The golden rules, Interface Design steps & Analysis, Design Evaluation, Case Study: Web App Interface Design		

Unit IV	Project Management: Process, Metrics, Estimations & Risks	08 Hours
<p>Project Management Concepts: The Management Spectrum, People, Product, Process, Project, The W5HH Principle, Metrics in the Process and Project Domains, Software Measurement : size & function oriented metrics(FP & LOC), Metrics for Project and Software Quality, Project Estimation :Observations on Estimation, Project Planning Process, Software Scope and feasibility, Resources: Human Resources, Reusable software, Environmental Resources. Software Project Estimation, Decomposition Techniques, Empirical Estimation Models: Structure, COCOMO II, Estimation of Object-oriented Projects, Specialized Estimation Case Study: Software Tools for Estimation, Project Scheduling: Basic Concepts, Defining a Task Set for the Software Project, Defining Task Network, Scheduling with time-line charts, Schedule tracking Tools:- Microsoft Project, Daily Activity Reporting & Tracking (DART)</p>		
Unit V	Project Management: Risk Management, Configuration Management, Maintenance & Reengineering	07 Hours
<p>Project Risk Management : Risk Analysis & Management: Reactive versus Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation, Risks Monitoring and Management, The RMMM plan for case study project</p> <p>Software Configuration Management: The SCM repository, SCM process, Configuration management for WebApps, Case study: CVS and Subversion Tools, Visual Source Safe from Microsoft & Clear Case. Maintenance & Reengineering: Software Maintenance, Software Supportability, Reengineering, Business Process Reengineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering</p>		
Unit VI	Software Testing	07 Hours
<p>Introduction to Software Testing, Principles of Testing, Testing Life Cycle, Phases of Testing, Types of Testing, Verification & Validation, Defect Management, Defect Life Cycle, Bug Reporting, GUI Testing, Test Management and Automation.</p>		
Books:		
Text:		
<ol style="list-style-type: none"> 1. Roger Pressman, –Software Engineering: A Practitioner’s Approach”, McGraw Hill, ISBN 0–07–337597–7 2. Ian Sommerville, –Software Engineering”, Addison and Wesley, ISBN 0-13-703515-2 		
References:		
<ol style="list-style-type: none"> 1. Carlo Ghezzi, –Fundamentals of Software Engineering", Prentice Hall India, ISBN-10: 0133056996 2. Rajib Mall, –Fundamentals of Software Engineering”, Prentice Hall India, ISBN-13: 978-8120348981 3. Pankaj Jalote, –An Integrated Approach to Software Engineering”, Springer, ISBN 13: 9788173192715. 4. S K Chang, –Handbook of Software Engineering and Knowledge Engineering”, World Scientific, Vol I, II, ISBN: 978-981-02-4973-1 5. Tom Halt, –Handbook of Software Engineering”, Clanye International, ISBN-10: 1632402939 		