

Course code	Course Name	L-T-P-Credits	Year of Introduction
IT364	Software Project Management	3-0-0-3	2016

Course Objectives

- To develop awareness regarding the theoretical and methodological issues related to software project management.
- To develop software projects based on current technologies.

Syllabus

Introduction to software engineering- Phases in Software development. Process models- prescriptive process models- Specialised process models- The unified process- Agile development- Agile development models. Project management concepts. Process and project metrics- Estimation for software projects- Software project estimation, decomposition techniques. Empirical estimation models- Task set- Scheduling. Risk management- The RMMM Plan. Software Configuration Management - The SCM Repository - The SCM Process. Software quality assurance- Formal Approaches to SQA. Statistical Software Quality Assurance- Six Sigma for Software Engineering. Software Reliability. The ISO 9000 Quality Standards. The SQA Plan. Software process improvement- The CMMI, SPI Return on Investment. SPI trends.

Expected Outcome

After the successful completion of the course students will be able to

- Identify the theoretical and methodological issues involved in modern software engineering project management
- Develop the transferable skills in logical analysis, communication and project management necessary for working within a team.
- Translate a specification to a design, and identify the components to build the architecture for a given problem, using an appropriate software engineering methodology.
- Select and use project management frameworks that ensure successful outcomes.
- Develop software projects based on current technologies, by managing resources economically and keeping ethical values.

References

1. Roger S. Pressman, Software Engineering, 8/e, McGraw Hill, 2014.
2. Ian Sommerville, Software Engineering, 7/e, University of Lancaster, Pearson Education, 2004.
3. Bob Huges, Mike Cotterell, Rajib Mall, Software Project Management, 8/e, McGraw Hill, 2015.
4. Walker Royce, Software Project Management : A Unified Frame Work, Pearson Education.

Course Plan

Module	Contents	Hours	Sem. Exam Marks
I	Introduction to software engineering- scope of software engineering, historical aspects, economic aspects, maintenance aspects, specification and design aspects, team programming aspects. Layered technology, processes, methods and tools.	3	15%

	Phases in Software development.		
	Process models- prescriptive process models- waterfall model, incremental models, evolutionary models, and concurrent models. Specialised process models- component based development, formal methods model, aspect oriented software development. The unified process, personal and team process models.	4	
II	Agile development- agility, agile process. Extreme programming- XP Values, The XP Process, Industrial XP, The XP Debate. Agile development models- Adaptive Software Development (ASD), Scrum, Dynamic Systems Development Method (DSDM), Crystal, Feature Driven Development (FDD), Lean Software Development (LSD), Agile Modeling (AM) , Agile Unified Process (AUP).	4	15%
	Project management concepts- the management spectrum, people, product, process, and project.	3	
FIRST INTERNAL EXAM			
III	Process and project metrics- software measurement- size oriented, function oriented, LOC and function point, metrics for software quality- measuring quality, defect removal efficiency, integrating metrics within the software process.	4	20%
	Estimation for software projects- project planning, software scope, resources. Software project estimation, decomposition techniques- Software Sizing, Problem-Based Estimation, Process-Based Estimation.	3	
IV	Empirical estimation models- structure of estimation models, COCOMO II model. Estimation for agile development. Make/buy decision.	4	15%
	Project scheduling- relationship between people and effort, effort distribution. Task set, defining a task network. Scheduling-timeline chart, tracking the schedule. Earned value analysis.	3	
SECOND INTERNAL EXAM			
V	Risk management- risk strategies, software risks, risk identification, risk projection, risk refinement, Risk Mitigation, Monitoring, and Management. The RMMM Plan.	4	20%
	Software Configuration Management - An SCM Scenario, Elements of a Configuration Management System, Baselines, Software Configuration Items. The SCM Repository - The Role of the repository, General Features and Content, SCM Features. The SCM Process- Identification of Objects in the Software Configuration, Version Control, Change Control, and	4	

	Configuration Audit, Status Reporting.		
VI	Software quality assurance- Background Issues, Elements of Software Quality Assurance. SQA Tasks, Goals, and Metrics. Formal Approaches to SQA. Statistical Software Quality Assurance- A Generic Example, Six Sigma for Software Engineering. Software Reliability -Measures of Reliability and Availability, Software Safety. The ISO 9000 Quality Standards. The SQA Plan.	3	20%
	Software process improvement- Approaches to SPI, Maturity Models. The SPI Process- Assessment and Gap Analysis, Education and Training, Selection and Justification, Installation/Migration, Evaluation, Risk Management for SPI, Critical Success Factors. The CMMI, The People CMM. Other SPI Frameworks. SPI Return on Investment. SPI trends.	3	
END SEMESTER EXAM			

QUESTION PAPER PATTERN

Maximum Marks: 100

Exam Duration: 3 hours

The question paper shall consist of Part A, Part B and Part C.

Part A shall consist of three questions of 15 marks each uniformly covering Modules I and II. The student has to answer any two questions ($15 \times 2 = 30$ marks).

Part B shall consist of three questions of 15 marks each uniformly covering Modules III and IV. The student has to answer any two questions ($15 \times 2 = 30$ marks).

Part C shall consist of three questions of 20 marks each uniformly covering Modules V and VI. The student has to answer any two questions ($20 \times 2 = 40$ marks).

Note : Each question can have a maximum of 4 subparts, if needed