Elective Course 8: Software Engineering

Course Type:	PS: Program Specialisation	Course Credits:	2
Course Code:	S3SE516	Course Duration:	30 Hours

Course Objective:

- To familiarize students with principles, methodologies, and tools for managing software projects effectively.
- To equip students with practical skills in project scheduling, budgeting, and risk management specific to software projects.
- To develop capabilities in agile project management methodologies and software lifecycle management.
- To cultivate analytical skills for quality assurance, performance measurement, and process improvement in software development.
- To foster understanding of contemporary challenges and innovations in software project management.

Course Outcomes:

- CO1: To understand the foundational concepts of IT Project Management including project goals, life cycle models, methodologies (ITPM), and various software development processes
- CO2: To analyze key project initiation elements like Requests for Proposal (RFP), business cases, feasibility studies, and use of structured analysis tools
- CO3: To apply appropriate project management tools for scheduling, resource allocation, and budgeting including Work Breakdown Structures (WBS), Gantt Charts, Responsibility Matrices, and estimation models.
- CO4: To evaluate IT project quality and risk by examining testing methodologies (black box, white box, stress/load testing) and applying risk management processes including identification, analysis, mitigation strategies, and control mechanisms.
- CO5: To design an effective IT project plan addressing leadership, communication, procurement, implementation, change management, ethics, multicultural team handling, and Project closure procedure

Unit/ Module	Content	CO Mapping	Hours Assigned

1	Overview of IT Project Management – Introduction, state of IT project management, need for project management, project goals, life cycle and IT development, extreme project management, PMBOK, ITPM, software development processes (Waterfall, Spiral, etc.), project feasibility	CO1	5
2	RFP, Proposal, Business Case, Project Selection and Approval, Contracting, IT Governance System Analysis and Design, Feasibility Study, Requirements Gathering, DFD, ERD, SRS, Project Charter, Project Planning Framework, Master Plan	CO2	5
3	Work Breakdown Structure (WBS), Responsibility Matrix, Gantt Chart, Calendar Scheduling, Project Management Tools, Budgeting, Software Estimation (LOC, Function Point, COCOMO, COCOMO II), Finalizing Schedule and Budget	CO3	5
4	Testing Techniques – Black box vs White box, Functional Tests, Code Reviews, Stress & Load Tests, IT Project Risk Management – Planning, Identification, Analysis, Strategies, Monitoring, Evaluation	CO4	5
5	Human Side of Project Management – Organization, Team, Environment, Communication, Monitoring, Reporting, Leadership, Ethics, Multicultural Teams, Change	CO5	3

	Management, Resistance, Conflict Handling		
6	Project Procurement & Outsourcing, Project Implementation, Administrative Closure, Project Evaluation, Audit	CO5	3
7	Emerging Trends in Software Project Management with related case studies	CO5	4

Textbooks:

1. Roger S. Pressman and Bruce R. Maxim, Software Engineering: A Practitioner's Approach, McGraw-Hill
2. Information Technology Project Management by Jack T. Marchewka, Wiley India, 2009.
3. Software Project Management by Hughes and Cornell. Tata McGraw-Hill
4. Harold Kerzner, Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Wiley, 12th Edition
5. Dr. Satish R. Billewar, Software Project Management: Includes Practicals, Dreamtech Press
6. Kathy Schwalbe, Information Technology Project Management, Cengage Learning, 7th Edition
7. IT Project Management by Joseph Phillips. Tata McGraw-Hill
8. Software Project Management by Joel Henry. Pearson Education, 2008

Reference Books:

1. Pankaj Jalote, Software Project Management in Practice, Pearson Education
2. Hughes & Cotterell, Software Project Management, Tata McGraw-Hill, 5th Edition
3. Bob Hughes, Mike Cotterell, Rajib Mall, Software Project Management, Tata McGraw-Hill
4. Jack T. Marchewka, Information Technology Project Management, Wiley India, 5th Edition
5. PMI – Project Management Institute, A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 6th Edition