INT411:SOFTWARE PROJECT MANAGEMENT

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: explain project characteristics and the various stages of software project development, including project planning fundamentals and project management activities.

CO2 :: apply cost-benefit analysis techniques incorporating AI-assisted processes and differentiate various software development life cycle models, including Agile, DevOps, and CI/CD.

CO3 :: determine software project cost and effort using established estimation techniques and AI-based estimation tools.

CO4 :: analyze activity planning, project scheduling, and risk assessment techniques to support effective software project execution.

CO5 :: demonstrate resource allocation, project scheduling, progress monitoring, and control using intelligent project management tools and earned value analysis techniques.

CO6 :: illustrate various software quality standards and AI-enabled quality assurance techniques for ensuring software quality and traceability.

Unit I

Introduction to Software project management : What is project? Software project versus other types, Nature of software production, Activities by Software Project Management, Key objectives of effective management, Problems with software projects, Risk reduction, Meaning of project, Software Project Versus Other Types, Nature of software production, Importance of software project management

Stepwise Project planning : Project scope, Objectives, Business Planning: determining objectives, Infrastructure, Forecasting demand for product, Characteristics, Proposal writing, Effort estimation, Requirement analysis, Risk identification, Legal issues

Unit II

Cost Estimation and Life Cycle Models : Meaning, Managing allocation of resources, Creating programme, Individual projects, Program management, Risk evaluation, Cost benefit analysis, Evaluation of individual projects, Multi-Criteria Decision Analysis (MCDA), AI-Enhanced Cost Estimation: Predictive cost estimation and resource prediction, Project approach : Introduction to Life Cycle Models, V-Process Model, Agile Model, Devops, CI/CD Pipeline

Unit III

Effort Estimation : Meaning, Problems with Estimation Basis, Estimation Techniques Albrecht Function Point Analysis, Functions Mark II, COCOMO Model, COCOMO extensions, AI-based Estimation Tools: Introduction to Natural Language Processing (NLP)-based requirement analysis and automated effort estimation using historical project data

Unit IV

Activity Planning : Objectives, Project Schedule, Managing the task: Managing the Plan, Network Planning Model, Time Dimension, Identifying Critical Path, Managing Change, Readjusting Goals and Milestones

Risk Management : Introduction to Risk, Categories of Risk, Dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Evaluating Risk to the Schedule, Applying the PERT Technique, Risk Adjusted Portfolio Performance (RAPP), Portfolio Optimisation and Diversification 2.0

Unit V

Resource Allocation, Monitoring and Control : Resource allocation introduction, Identifying resource requirements, Scheduling resources, Resource allocation, Publishing the resource & cost schedule, Scheduling sequence, Creating frameworks, Data collection, Visualizing progress, Status reports, Milestone analysis, Cost monitoring, Change control, Cost (direct and indirect), Earned value analysis, Performance ratio, AI in Monitoring: Use of AI for real-time project status dashboards, intelligent notifications, and progress visualization

Unit VI

Software quality & small projects : Defining Software Quality, Software Quality: ISO9126, ISO/IEC 25010 Quality Model, Product versus process quality, Management of external standards, Problems with student projects, Content of project plan, Steps to be taken to incorporate a new Company, Documents Required, Steps to register for MSME certificate, Blockchain for Software Quality Management: Ensuring Traceability and Transparency in Software Development

Text Books:

1. SOFTWARE PROJECT MANAGEMENT by BOB HUGHES, MIKE COTTERELL, AND RAJIB MALL, MC GRAW HILL

References:

1. SOFTWARE PROJECT MANAGEMENT by SUBRAMANIAN CHANDRAMOULI, SAIKAT DUTT, PEARSON

2. SOFTWARE PROJECT MANAGEMENT (INCLUDES PRACTICALS) by DR. SATISH R. BILLEWAR, DTES, DREAMTECH PRESS