SOFTWARE ENGINEERING

Course Code	23CS3403	Year	II	Semester	II
Course Category	Professional Core	Branch	CSE,IT	Course Type	Theory
Credits	3	L – T – P	3-0-0	Pre requisites	
Continuous Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes	
Upon successful completion of the course, the student will be able to:	
CO1	Understand the fundamentals of Software Engineering and various process models	L2
CO2	Apply project management and requirement analysis techniques for the software Projects.	L3
CO3	Use various design elements along with testing to prepare software system.	L3
CO4	Analyze various maintenance and risk aspects of software with CASE tools	L4

Syllabus

Unit No.	CONTENTS	Mapped CO
I	**Introduction:** Evolution, Software development projects, Exploratory style of software developments, Emergence of software engineering, Notable changes in software development practices, Computer system engineering. **Software Life Cycle Models:** Basic concepts, Waterfall model and its extensions, Rapid application development, Agile development model, Spiral model, **Unified Software Process Model**	CO1
II	**Software Project Management:** Software project management complexities, Responsibilities of a software project manager, Metrics for project size estimation, Project estimation techniques, Empirical Estimation techniques, COCOMO, **FPA** **Requirements Analysis and Specification:** Requirements gathering and analysis, Software Requirements Specification (SRS), Formal system specification, Axiomatic specification, Algebraic specification.	CO1, CO2
III	**Software Design:** Overview of the design process, How to characterize a good software design? Layered arrangement of modules, Cohesion and Coupling.approaches to software design. **Agility:** Agility and the Cost of Change, Agile Process, Extreme Programming (XP), Other Agile Process Models, Tool Set for the Agile Process (Text Book 2) **Function-Oriented Software Design:** Overview of SA/SD methodology, Structured analysis, Developing the DFD model of a system, Structured design, Detailed design, and Design Review.	CO1, CO3

	User Interface Design: Characteristics of a good user interface, Basic concepts, Types of user interfaces, Fundamentals of component-based GUI development, and user interface design methodology. **Golden Rules**	
IV	**Coding and Testing:** Coding, Code review, Software documentation, Testing, Black-box testing, White-Box testing, Debugging, Program analysis tools, Integration testing**,** testing object-oriented programs, Smoke testing, and Some general issues associated with testing. **Software Reliability and Quality Management:** Software reliability. Statistical testing, Software quality, **SQA techniques, Software Reviews,** Software quality management system, ISO 9000.SEI Capability maturity model. Few other important quality standards, and Six Sigma	**CO1, CO3**
V	**Computer-Aided Software Engineering (Case):** CASE and its scope, CASE environment, CASE support in the software life cycle, other characteristics of CASE tools, Towards second generation CASE Tool, and Architecture of a CASE Environment. **Software Maintenance:** Characteristics of software maintenance, Software reverse engineering, Software maintenance process models and Estimation of maintenance cost. **Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.(Text Book2)**	**CO1, CO4**

LearningResources
TextBooks
1. Fundamentals of Software Engineering, Rajib Mall, 5th Edition,PHI.
2. Software Engineering A practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition.
ReferenceBooks
1. Software Engineering, Ian Sommerville,10thEdition, Pearson.
2. SoftwareEngineering,   PrinciplesandPractices, Deepak Jain, Oxford University Press.
E-Resources&otherdigitalmaterial
1) https://nptel.ac.in/courses/106/105/106105182/
2) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01260589506387148827_shared/overview
3) https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003904735_shared/overview