School of Computer Science & Information Technology, DAVV, Indore
CS-4305: SOFTWARE ENGINEERING
Semester II

Faculty Name: Dr. Ugrasen Suman

UNIT-I
Introduction to Software Engineering & Software Processes: Software, Software Classifications and Characteristics, Emergency of Software Engineering, What is Software Engineering? Software Engineering Challenges, Software Processes: Process model, Elements and Characteristics of Process model, Process Classification, Phased Development Life Cycle, Software Development Processes: Waterfall model, Iterative Waterfall model, Prototyping model, Incremental model, Spiral model, RAD model, Agile process model, and RUP process model. Component-Based Development and Reusability. Comparative study of various development models.

UNIT-II
Project Management & Planning: Project management essentials, Project success and failures, Project Life Cycle, Project team structure and organization, Software Configuration Management, Risk Management. Project planning activities, Metrics and Measurements, Project Size Estimation, Effort Estimation Techniques, Staffing and Personnel Planning, Project Scheduling and Miscellaneous Plans.

UNIT-III
Requirement Engineering: Software Requirements, Requirement Engineering Process, Requirement Elicitation, Requirement Analysis (Structured Analysis, Object Oriented Analysis, Data Oriented Analysis and Prototyping Analysis), Requirements Specification, Requirement Validation, and Requirement Management.

UNIT-IV
Software Design and Coding: Software Design Process, Characteristics of a Good Design, Design Principles, Modular Design (Coupling and Cohesion), Software Architecture, Design Methodologies (Function Oriented Design and Object Oriented Design), Structured Design Methodology (SDM), Transaction Analysis and Logical Design; Coding principles, Coding process, Code verification and documentations.

UNIT-V
Software Testing, Quality and Maintenance: Testing Fundamentals, Test Planning, Black Box Testing, White Box Testing, Levels of Testing, Debugging Approaches, Quality Concept, Quality Factors, Verification and Validation, Quality Assurance Activities, Quality Standards: Capability Maturity Model (CMM), ISO 9000, Six Sigma. Software Reliability, Software Maintenance, Evolution, and Reengineering.

Text Book:
1. *Software Engineering: Concepts & Practices*- **Ugrasen Suman**, *Cengage Learning publications.*

Reference Books:
1. *An Integrated Approach to Software Engineering*- **Pankaj Jalote**, Narosa Publishing House.
2. *Software Engineering-A practitioner's approach*- **R. S. Pressman**, Tata McGraw-Hill International Editions, New York.
3. *Software Engineering*- **Ian Sommerville**, Pearson Education, New Delhi.
4. *Software Engineering Concepts*-**Richard E. Fairly**, Tata McGraw Hill Inc. New York.
5. *Fundamentals of Software Engineering*-**Rajib Mall**, PHI, New Delhi.