SYLLABUS

COURSE CONTENT

UNIT–I : BASICS OF SOFTWARE ENGINEERING

Software and Software Engineering – simple definition, need, SDLC Phases: Requirements, Design, Coding, Testing, Deployment, Maintenance Software Myths: few examples of management, customer, developer myths.Very small intro: how AI can help in SDLC

UNIT–II : SOFTWARE PROCESS MODELS

Need of software process model .Waterfall Model – simple diagram, uses, limits.Incremental Model – build in steps.Spiral Model – cycles + risk idea (only concept).Agile – short idea: sprints, customer feedback.One small point: AI tools for planning and estimation.

UNIT – III: Introduction to AI & Software Engineering

Overview of computer software and software systems.Limitations of traditional software engineering.The software crisis: causes and impact.Need for increased software power.Human–computer responsiveness.Software in dynamic environments.Self-maintaining and adaptive software.Need for AI in modern software systems.

UNIT – IV: AI Problems vs Traditional SE Problems

What defines an AI problem.“Correct” vs “Good-enough” solutions.Process-focused problem solving (HOW vs WHAT).Handling dynamic and context-dependent problems.Modular approximations in AI.Classical SE methodologies: SAV (Specify & Verify) and SAT (Specify & Test).Prototyping as a bridge between specification and implementation.

UNIT – V: Modern Engineering Approaches for AI Systems

Incremental & exploratory software development (RUDE cycle).Malleable and flexible software structures.AI components over conventional software skeletons.New paradigms: automatic programming, transformational implementation, POLITE methodology.

Max Marks: 10

S.No.	CO	Questions	BT
Unit I: (BASICS OF SOFTWARE ENGINEERING)			
1	1	Define Software and Software Engineering. Explain the need for Software Engineering.	L4
2	1	Explain Software Development Life Cycle (SDLC) and describe all its phases in detail.	L3
3	1	Discuss the Requirements and Design phases of SDLC with examples.	L4
4	1	Explain Coding, Testing, Deployment, and Maintenance phases clearly.	L3
5	1	What are Software Myths? Explain Management, Customer, and Developer myths with examples.	L5
6	1	Describe the importance of SDLC in software development.	L4
7	1	Explain the need and objectives of Software Engineering.	L3
8	1	Discuss different categories of Software Myths in detail.	L5
9	1	Write a short note on how Artificial Intelligence (AI) helps in SDLC	L4

S.No.	CO	Questions	BT
Unit II: (SOFTWARE PROCESS MODELS)			
1	2	Explain the need for a Software Process Model in software development.	L4
2	2	Describe the Waterfall Model with a neat diagram, its uses, and limitations.	L3
3	2	Explain the Incremental Model and how software is built in steps.	L4
4	2	Discuss the Spiral Model and explain its risk management concept.	L3
5	2	Explain Agile Model with the concepts of sprints and customer feedback.	L5
6	2	Compare Waterfall Model and Incremental Model.	L4
7	2	Compare Spiral Model and Agile Model.	L3
8	2	Discuss advantages and disadvantages of the Waterfall Model.	L5
9	2	Explain different types of Software Process Models with suitable examples.	L4

10	2	Write a short note on how AI tools help in project planning and cost estimation.	L3
S.No.	CO	Questions	BT
Unit III: (Introduction to AI & Software Engineering)			
1	3	Give an overview of computer software and software systems.	L4
2	3	Explain the limitations of traditional software engineering.	L3
3	3	Discuss the Software Crisis, its causes, and impact.	L4
4	3	Explain the need for increased software power in modern systems.	L3
5	3	What is Human–Computer Responsiveness? Explain its importance.	L5
6	3	Explain software in dynamic environments with examples.	L4
7	3	Describe self-maintaining and adaptive software systems.	L3
8	3	Discuss the need for AI in modern software systems.	L5
9	3	Explain the role of AI in overcoming limitations of traditional software engineering.	L4

10	4	Write short notes on prototyping as a bridge between specification and implementation.	L3

S.No.	CO	Questions	BT
Unit V: (Modern Engineering Approaches for AI Systems)			
1	5	Explain Incremental and Exploratory Software Development (RUDE cycle).	L4
2	5	What are malleable and flexible software structures? Explain.	L3
3	5	Discuss the concept of AI components over conventional software skeletons.	L4
4	5	Explain automatic programming and transformational implementation.	L3
5	5	What is POLITE methodology? Explain its features.	L5
6	5	Compare traditional development approaches with modern AI engineering approaches.	L4
7	5	Explain the importance of exploratory development in AI systems.	L3
8	5	Discuss new paradigms in AI-based software engineering.	L5
9	5	Write short notes on flexible software architectures for AI systems.	L4

10	5	Explain modern engineering challenges in developing AI systems.	L3

Note: L1-Remembering, L2-Understanding, L3-Applying, L4-Analyzing, L5-Evaluating, and L6-Creating

Instruction to Faculty Members:

The Six Levels of Bloom's Taxonomy:

1. Remembering: Retrieving, recognizing, and recalling relevant knowledge from long-term memory (e.g., list, define, name, locate).
2. Understanding: Constructing meaning, explaining ideas, or concepts (e.g., summarize, interpret, classify, compare).
3. Applying: Using information in new situations or implementing procedures to solve problems (e.g., solve, use, demonstrate, implement).
4. Analyzing: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure (e.g., contrast, categorize, distinguish, diagram).
5. Evaluating: Making judgments based on criteria and standards through checking and critiquing (e.g., judge, critique, justify, defend, argue).
6. Creating: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure (e.g., design, construct, develop, formulate).