KAMARAJ
COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution - AFFILIATED TO ANNA UNIVERSITY, CHENNAI)
S.P.G.Chidambara Nadar - C.Nagammal Campus
S.P.G.C. Nagar, K.Vellakulam – 625 701 (Near VIRUDHUNAGAR).

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Industry Certified Value Added Course on

"AGENTIC AI"

(2026 – 2027 ODD SEMESTER)

COURSE OBJECTIVES

- To understand the fundamental concepts of Artificial Intelligence, Generative AI and Agentic AI.
- To learn the architecture, components, reasoning capabilities, and context-handling mechanisms of AI agents.
- To develop AI agents using modern frameworks such as LangChain, LangGraph, and Phidata.
- To build intelligent AI applications using Python, APIs, tool calling, workflows, and Retrieval-Augmented Generation (RAG).
- To design and deploy multi-agent systems while understanding ethical considerations and real-world applications of Agentic AI.

UNIT 1: INTRODUCTION TO AGENTIC AI (10 Hours)

Introduction to Artificial Intelligence – Evolution of AI – Generative AI Basics – What is Agentic AI? – Characteristics of AI Agents – Components of AI Agents – AI Agent Architecture – Applications of Agentic AI – Real-world Use Cases of Autonomous AI Systems.

UNIT 2: PROMPT ENGINEERING AND AI REASONING (10 Hours)

Introduction to Prompt Engineering – Types of Prompting Techniques – Zero-shot Prompting – Few-shot Prompting – Chain-of-Thought Prompting – AI Reasoning Concepts – Context Handling Mechanisms – Memory in AI Systems – Designing Effective Prompts for Intelligent Agents.

UNIT 3: BUILDING AI AGENTS WITH LANGCHAIN AND PHIDATA (10 Hours)

Introduction to LangChain – LangChain Components – LangGraph Components – Data Pipelines in AI Applications – LangChain Expression Language (LCEL) – Building AI

Agents using LangChain – Developing AI Agents with Phidata – No-Code and Low-Code Agent Development Approaches.

UNIT 4: AI WORKFLOWS AND APPLICATION DEVELOPMENT (10 Hours)

AI Agent Architecture – Tool Calling Mechanisms – AI Workflows – Human-in-the-Loop Systems – Python for AI Applications – API Integration Concepts – OpenAI API Integration – Developing Simple AI User Interfaces – Building End-to-End AI Applications.

UNIT 5: RAG, MULTI-AGENT SYSTEMS AND AI ETHICS (10 Hours)

Retrieval-Augmented Generation (RAG) – Embeddings and Vector Representations – Vector Databases – Document-Based AI Systems – Multi-Agent Systems – AI Automation – Responsible AI Practices – AI Ethics and Governance – Advanced Agent Development with AutoGen – Agentic AI on Cloud Platforms – Career Opportunities in Agentic AI – Final Project Development and Presentation.

Total : 50 Hours

COURSE OUTCOMES

After successful completion of the course, the students will be able to

CO. No.	Course Outcome	Knowledge Level
CO1	Summarize the concepts of Agentic AI along with their real-world Use Cases and applications of Autonomous AI Systems.	K3 - Apply
CO2	Apply prompt engineering techniques, reasoning strategies, and context management methods in AI systems.	K3 - Apply
CO3	Develop AI agents using LangChain, LangGraph, LCEL, and Phidata frameworks.	K3 - Apply
CO4	Build AI-powered applications using Python, APIs, tool calling, and workflow orchestration techniques.	K3 - Apply
CO5	Design Retrieval-Augmented Generation (RAG) systems and multi-agent applications while adhering to ethical AI practices.	K3 - Apply

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1:

Professional Skills: The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.

PSO2:

Problem - Solving Skills: The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

CO - PO MAPPING

Course Name	CO. No.	POs											PSOs	
		1	2	3	4	5	6	7	8	9	10	11	1	2
AGENTIC AI	CO1	H	M	L	L	M	L	-	-	-	M	M	H	H
	CO2	H	M	M	L	H	L	-	-	-	M	M	H	H
	CO3	H	H	M	M	H	M	-	M	L	M	M	H	H
	CO4	H	M	H	M	H	M	-	M	L	H	M	H	H
	CO5	H	H	H	H	H	M	-	M	L	H	M	H	H

H - High, M - Moderate, L – Low

SDG MAPPING

	SDGs																
AGENTIC AI	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
				✓				✓	✓								✓

Trainer	VAC Course Incharges	VAC Coordinators	HOD – CSE
Mrs.Gopika Raji, Python Trainer, Dot ComInfoway, Madurai.	Dr.A.Anandh, Prof. -CSE Mrs.S.Archana Devi, AP-CSE	Mrs.S.Athilakshmi,AP/CSE Mrs.S.ArchanaDevi, AP/CSE	Dr.A.Meenakshi, Prof.& HOD-CSE