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

"Foundations of Agentic AI & Multi-Agent Systems"

01-06-2026 to 06-06-2026 (2026 – 2027 ODD)

COURSE OBJECTIVES

CO1	Understand the fundamental concepts and evolution of Agentic AI and intelligent agents.
CO2	Explore agent architectures, decision-making processes, planning, and reasoning techniques.
CO3	Learn the principles of multi-agent systems, including communication, coordination, and collaboration.
CO4	Develop AI agents capable of autonomous task execution and problem-solving.
CO5	Implement agent workflows using contemporary Agentic AI frameworks and tools.

UNIT 1 : Core Concepts of Agentic AI and Prompt Engineering **10 Hours**

Artificial Intelligence (AI)- Generative AI Basics-Agentic AI concepts-Components of AI Agents and AI Agent Architecture - Perception, memory, reasoning, planning, action, and learning mechanisms - Prompt Engineering-Types of Prompting-AI Reasoning techniques and Context Handling for developing effective, context-aware, and autonomous AI systems.

UNIT 2 : Agent Development Frameworks and AI Agent Engineering **10 Hours**

LangChain and LangGraph frameworks - Core Components, Workflows, and Data pipeline management -LangChain Expression Language (LCEL) for AI agents- Development of AI Agents using Phidata - Exploration of No-Code/Low-Code platforms.

UNIT 3 : AI Agent Workflows and Application Development **10 Hours**

AI Agent Architecture -Tool Calling mechanisms - AI Workflows - Building AI applications including the integration of external tools, services, and APIs to enhance agent capabilities. OpenAI API integration and development of real-world AI-powered applications.

UNIT 4 : Retrieval-Augmented Generation and Knowledge Systems **10 Hours**

Retrieval-Augmented Generation (RAG)- Architecture -Workflow. Concepts of embeddings and vector databases for efficient storage, indexing, and retrieval of semantic information from large-scale datasets - Development of document-based AI systems.

UNIT 5 : Multi-Agent Systems and Responsible AI **10 Hours**

Multi-Agent Systems and AI Automation - Collaboration, Coordination, and Communication among intelligent agents for solving complex real-world problems - Principles of Responsible AI - Ethical considerations -Governance- Emerging career opportunities-Advanced agent development using AutoGen.

Total: 50 Hours

COURSE OUTCOMES

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

CO. No.	Course Outcome	Knowledge Level
CO1	Apply Agentic AI concepts to solve complex real-world problems.	K3 – Apply
CO2	Create autonomous and collaborative AI systems using state-of-the-art frameworks and tools.	K3 – Apply
CO3	Develop intelligent applications integrating LLMs, APIs, and knowledge retrieval systems.	K3 – Apply
CO4	Experiment ethical, security, and governance aspects of AI-powered autonomous systems.	K3 – Apply
CO5	Model career opportunities and emerging trends in Agentic AI and Multi-Agent Systems.	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
Foundations of Agentic AI & Multi-Agent Systems	CO1	H	M	L	-	M	-	-	-	-	-	-	H	M
	CO2	M	H	M	L	H	-	-	-	M	-	-	M	H
	CO3	M	H	M	M	H	-	-	-	L	-	-	M	H
	CO4	M	M	L	M	M	M	L	H	M	M	L	L	M
	CO5	L	L	-	-	M	L	-	L	M	H	M	L	M

H - High, M - Moderate, L – Low

SDG MAPPING

Foundations of Agentic AI & Multi-Agent Systems	SDGs															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
				✓				✓	✓							✓	

Resource Person
Mr.K.Abhishek
CEO

Course Cordinators
Mrs.M.Mohana, AP/CSE
Mr.D.Pradhiba, AP/CSE

VAC Coordinators
Mrs.S.Athilakshmi, AP/CSE
Mrs.S.ArchanaDevi, AP/CSE

HOD
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