

22PCM316T					Elective - Artificial Intelligence (AI) in Petrochemical Processes					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100

**COURSE OBJECTIVES**

- Identify the problems where AI is required and the different methods available
- Learn Neural Networks
- Gain primary knowledge on data science and
- Explain the components of IoT Architecture and platforms of IoT ecosystem
- Developing IoT Systems using Raspberry Pi and Python

**UNIT I: Introduction to Artificial Intelligence****7 Hr.**

AI Problems, Intelligent Agents, Problem Formulation, Basic Problem Solving Methods. Searching: Search strategies, Uniformed Search Strategies, State-Space Search, Bi-Directional Search, BFS, DFS, Heuristic Search Strategies, Local Search Algorithms

**UNIT II: Introduction to Neural Networks****6 Hr.**

Characteristics of Neural Networks, Historical Development of Neural Networks Principles, Artificial Neural Networks, Terminology, Models of Neuron, Topology, Basic Learning Laws, , Basic Functional Units

**UNIT III: Introduction to Data Science****7 Hr.**

Data, types of data, data quality, issues, data architecture, data quality issues, data architecture. Big Data, big data architecture, big data technologies, requirements. Statistics related to data sciences, clustering, and regression analysis

**UNIT IV: Introduction to IoT****6 Hr.**

IoT Basics, Physical and Logical Designs, Elements of IoT - Basic Architecture of an IoT. Application Sensors & Actuators, Edge Networking (WSN), GateDomain-Specific IoTs - Home Automation, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health and Life Style

**Max. 26 Hr.****COURSE OUTCOMES:**

At the end of this course students will be able to

- CO1:** Identify the AI based problems
- CO2:** Apply techniques to solve the AI problems
- CO3:** Discuss on Neural Networks
- CO4:** Understand the components of IoT infrastructure.
- CO5:** Identify the architecture of IoT and its applications.
- CO6:** Analyzing data in IoT systems.

**TEXT/ REFERENCE BOOKS**

1. Russell, S.J. and Norvig, P., Artificial Intelligence: A Modern Approach, Pearson Education.
2. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", McGraw Hill.
3. Dan W. Patterson, "Introduction to AI and ES", Pearson Education.
4. G.Luger, W.A. Stubblefield, "Artificial Intelligence", Addison-Wesley Longman.
5. N.J.Nilson, "Principles of Artificial Intelligence", Narosa Publishing House.
6. Pethuru Raj and Anupama C. Raman. The Internet of Things: Enabling technologies, platforms, and use cases. Auerbach Publications,.
7. Internet of Things with Python, Gaston C. Hillar, Packt Open Source
8. Rajkumar Buyya and Amir Vahid Dastjerdi, eds. Internet of Things: Principles and paradigms. Elsevier.

**END SEMESTER EXAMINATION QUESTION PAPER PATTERN**

**Max. Marks: 100**

Part A: 10 Questions each carrying 5 marks

Part B: 5 Questions each carrying 10 marks

**Exam Duration: 3 Hr.**

50 Marks

50 Marks