Master of Technology (Artificial Intelligence)

Program Outcomes (POs)

PO 1: An ability to independently carry out research /investigation and development work to solve practical problems.

PO 2: An ability to write and present a substantial technical report / document.

PO 3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor.

PO 4: Students should be able to identify, analyze user requirements and use them to design and build intelligent computing systems.

Program Specific Outcomes (PSO)

PSO1: Apply the knowledge of building the artificial agents, basic and advanced learning techniques, reasoning and inference mechanisms to the knowledge base, natural language processing tools, and software engineering principles to develop the real time Artificial Intelligence based projects.

PSO2: Design and develop the efficient and optimized algorithms for intelligent agents, knowledge base systems and machine learning in the area of artificial intelligence and its sub domains like IoT, image processing, natural language processing, data analytics and so on.

Course Outcomes (COs)

2020-22 Batch

Semester	Course Code	Course Name	Course Outcomes (COs)
I	20MTAI101	Mathematical Foundations for AI	CO1:Explain the principles of Logic.
			CO2:Solve path traversal problems using Graph theory.

			CO3:Outline the basics of language theory.
			CO4:Illustrate various Matrix operations
			CO5:Use matrices to solve linear system problems.
			CO6:Discuss applications of orthogonality in Euclidean spaces
20MTAI102	Machine Learning with Python		CO1:Explain fundamentals of Machine Learning.
			CO2:Choose learning algorithms to solve machine learning problems.
			CO3:Employ data preprocessing techniques to prepare data for machine learning.
			CO4:Choose best features for learning using dimensionality reduction.
			CO5:Identify similarity in data using cluster analysis.
			CO6:Design forecasting systems using time series analysis.
20MTAI131	Artificial Neural Network and Deep Learning		CO1:Explain the fundamentals of neural network.
			CO2:Explain the applications of neural network.
			CO3:Design recurrent neural networks for modeling sequence.
			CO4:Describe the various forms of optimizations on RNN.
			CO5:Use autoencoders for feature extraction.
			CO6:Design image processing systems using CNN.
20MTAI132	Genetic Algorithm and Application		CO1:Explain fundamentals of genetic algorithm.
			CO2:Describe the usage of various genetic operators.
			CO3:Explain various the concepts of evolutionary computation theory.
			CO4:Employ evolution strategies in problem solving.
			CO5:Discuss the applications of GA.
			CO6:Design machine learning system using genetic algorithm.
20MTAI133	Probabilistic Graphical Model		CO1:Explain the basic concepts of Probabilistic graphical techniques.

			CO2:Construct a Bayesian network for a given problem.
			CO3:Discuss the various Undirected Graphical models.
			CO4:Construct a temporal model for a given problem.
			CO5:Explain the construction of Gaussian Network Model.
			CO6:Employ inference techniques on probabilistic graphical models to solve problems.
	20MTAI141	Data Visualization	CO1:Interpret loading of data and present them pictorially.
			CO2:Employ the data wrangling in Tableau.
			CO3:Employ the database concepts in tableau.
			CO4:Create charts, graphs for data visualization
			CO5:Use Tableau for creating reports and dashboards
			CO6:Dissect the data in tableau.
	20MTAI142	Fuzzy Logic and Applications	CO1:Describe random processes.
			CO2:Explain fuzzy logic properties.
			CO3:Distinguish between classical relations and fuzzy relations.
			CO4:Illustrate fuzzy to crisp conversions.
			CO5:Explain the basics of rule-based systems.
			CO6:Use fuzzy classification to solve decision making problems.
	20MTAI143	Inferential Statistics	CO1:Explain the concepts of inferential statistics.
			CO2:Test hypothesis using parameter tests.
			CO3:Test hypothesis using non-parameter tests.
			CO4:Illustrate parameter estimation techniques.
			CO5:Explain Bayesian Statistical Inference procedures.
			CO6:Solve problems using Bayesian Statistical Inference.
	18MTRM01	RESEARCH METHODOLOGY AND IPR	CO1:Describe research problem formulation.
			CO2:Write a research proposal without plagiarism.

			CO3:Discuss the nature of intellectual property rights.
			CO4:Discuss about the international scenario with respect to IPR.
			CO5:Describe patent rights.
			CO6:Discuss the advancements in IPR.
	20MTAI102L	MACHINE LEARNING WITH PYTHON LAB	CO1:Solve classification problems using machine learning.
			CO2:Solve regression problems using machine learning.
			CO3:Design intelligent systems for healthcare domain using machine learning.
			CO4:Design intelligent systems for e-commerce domain using machine learning.
			CO5:Construct machine learning model for environment domain.
			CO6:Solve personality profiling problem using machine learning.
	20MTAI131L	ARTIFICIAL NEURAL NETWORK AND DEEP LEARNING LAB	CO1:Design a perceptron network to solve a given problem.
			CO2:Write a program to implement error back propagation in artificial neural network.
			CO3:Write a program to implement McCulloh-Pitts neuron model.
			CO4:Solve sequential prediction problems using recurrent neural networks.
			CO5:Design autoencoders to regenerate noisy images.
			CO6:Create SOM networks to solve classification problems.
	20MTAI132L	GENETIC ALGORITHM AND APPLICATION LAB	CO1:Write programs to implement genetic algorithm.
			CO2:Solve prediction problems using genetic algorithm.
			CO3:Write programs to implement learning rules.
			CO4:Illustrate genetic algorithm life cycle.
			CO5:Solve numerical constraint optimization problems using genetic algorithm.

			CO6:Solve search problems using genetic algorithm.
	20MTAI133L	PROBABILISTIC GRAPHICAL MODEL LAB	CO1:Demonstrate basic operations of probabilistic distributions using R.
			CO2:Experiment with built in functions in packages of R.
			CO3:Construct probabilistic graphical models using packages of R.
			CO4:Demonstrate learning of parameters in probabilistic graphical models using R.
			CO5:Solve problems using probabilistic model inferences in R.
			CO6:Interpret experiments through visualizations using R.
II	**20MTAI201**	Image Processing and Computer Vision	CO1:Explain basic concepts of Image Processing using OpenCV.
			CO2:Employ image processing techniques to solve problems.
			CO3:Solve image classification problem.
			CO4:Solve image segmentation problems.
			CO5:Demonstrate transfer learning using ResNet.
			CO6:Demonstrate NLP techniques for image captioning problem.
	20MTAI202	Advanced Machine Learning	CO1:Construct machine learning models using tensorflow.
			CO2:Employ ensemble methods in machine learning.
			CO3:Employ reinforcement learning to solve problems.
			CO4:Demonstrate model evaluation techniques in machine learning.
			CO5:Illustrate hyperparameter tuning in machine learning models.
			CO6:Demonstrate deployment of machine learning models on servers.
	20MTAI231	Natural Language Processing	CO1:Explain the basic concepts of natural language processing.
			CO2:Compare the role of syntactic parsing and semantic

			analysis in natural language processing in unstructured data.
			CO3:Demonstrate language generation in natural language processing.
			CO4:Illustrate the importance of linguistic components in natural language processing.
			CO5:Create corpus for text analysis in natural language processing.
			CO6:Compare the various statistical techniques used in natural language processing.
	20MTAI232	Digital Signal Processing	CO1:Explain the basic concepts of digital signal processing.
			CO2:Illustrate the processing of signals for different kind of applications.
			CO3:Compare circular convolution with linear convolution.
			CO4:Design digital filters.
			CO5:Illustrate analysis of signals using discrete Fourier transform (DFT).
			CO6:Illustrate analysis of signals using Z-Transform.
	20MTAI233	Sensor Technology	CO1:Describe the physical quantities and human errors.
			CO2:Identify characteristics of measurement of the sensors.
			CO3:Employ the static and dynamic characteristics of transducers in real applications.
			CO4:Dissect the characteristics for embedded sensors in industry.
			CO5:Illustrate the applications of Sensors in Real time systems.
			CO6:Develop smart applications using the sensor technologies.
	20MTAI241	Cloud Web services	CO1:Identify the various cloud services.
			CO2:Discuss the provision of various IT services at different deployment models on cloud.
			CO3:Recommend the optimal web services for the given service requirements.
			CO4:Compare and contrast the various cloud web services.

			CO5:Illustrate cost minimization for a business organization using cloud web services.
			CO6:Illustrate the steps to migrate to cloud web services.
	20MTAI242	Data Analytics using SQL	CO1:Explain the basics of SQL.
			CO2:Demonstrate SQL DDL commands.
			CO3:Demonstrate SQL DML commands.
			CO4:Write SQL queries to retrieve data from tables
			CO5:Use aggregate functions in SQL queries.
			CO6:Write complex sub queries to retrieve data from multiple tables.
	20MTAI243	Reinforcement Learning	CO1:Explain the fundamental concepts of reinforcement learning.
			CO2:Illustrate efficient solution frameworks for Reinforcement learning.
			CO3:Solve complex problems using reinforcement learning.
			CO4:Illustrate the various solution approaches in reinforcement learning.
			CO5:Use reinforcement learning in probabilistic problems.
			CO6:Discuss the applications of reinforcement learning in various domains.
	20MTAI202L	ADVANCED MACHINE LEARNING LAB	CO1:Construct machine learning models for a given problem using tensorflow.
			CO2:Use ensemble learning techniques to build machine learning models.
			CO3:Use reinforcement learning techniques to build machine learning models.
			CO4:Assess the performance of machine learning models using model evaluation techniques.
			CO5:Construct optimal machine learning models using optimization techniques.
			CO6:Demonstrate deployment of machine learning models.
	20MTAI231L	NATURAL LANGUAGE PROCESSING LAB	CO1:Write a program to tag contents of a document.

			CO2:Use NLP techniques to identify keywords from text data.
			CO3:Identify similarity of text using NLP techniques.
			CO4:Create a POS tagger using NLP techniques.
			CO5:Identify sentiment of a text using NLP techniques.
			CO6:Write a program to perform text summarization.
	20MTAI232L	DIGITAL SIGNAL PROCESSING LAB	CO1:Demonstrate basic operations in digital signal processing.
			CO2:Solve difference equations.
			CO3:Demonstrate discrete fourier transforms on digital signals.
			CO4:Experiment convolution of two sequences using DSP kit.
			CO5:Compare impulse response of first order and second order systems using DSP kit.
			CO6:Design FIR filter using DSP kit.
	20MTAI233L	SENSOR TECHNOLOGY LAB	CO1:Explain the characteristics of different sensors and Transducers.
			CO2:Use Sensors to measure various physical parameters used in industrial applications.
			CO3:Examine the role of sensors in industrial applications.
			CO4:Experiment with transducers in applications.
			CO5:Use embedded C to interface sensors, actuators with microcontroller boards.
			CO6:Design real time application using sensors, actuators using microcontroller boards.
III	**20MTAI351**	CHAT BOT DEVELOPMENT	CO1:Describe a chat bot from the scratch.
			CO2:Employ Advanced Deep learning NLP techniques
			CO3:Demonstrate language modeling using RNN.
			CO4:Examine the sentiment analyzer.
			CO5:Construct Bot using tensorflow and pytorch

			CO6:Solve the real life NLP problems using the concepts learnt.
	20MTAI352	AI PLATFORMS	CO1:Explain the importance of AI platforms.
			CO2:Describe the various approaches used in AI platforms
			CO3:Create AI solutions for broader areas
			CO4:Explain AI applications with respect to deployment.
			CO5:Differentiate possible solutions of AI applications.
			CO6:Solve the real life problems using the AI cloud services learnt
	20MTAI353	EMBEDDED SYSTEMS	CO1:Classify an Embedded systems based on its attributes and illustrate various steps in design process.
			CO2:Distinguish various I/O ports, communication protocols and Timers used in an Embedded system.
			CO3:Classify various peripherals of an Embedded Systems.
			CO4:Demonstrate characteristics and attributes of an embedded system.
			CO5:Use the real time operating system concepts for embedded system applications.
			CO6:Employ the concepts learnt to solve the real problems.
	20MTOE321	INTRODUCTION TO ARTIFICIAL INTELLIGENCE	CO1:Identify the basic concepts of neural networks.
			CO2:Compare neural network learning techniques.
			CO3:Explain single layer perceptron neural networks.
			CO4:Demonstrate multilayer perceptron neural networks.
			CO5:Compare the different associative memory concepts in retrieving information in data
			CO6:Illustrate the different field of application of neural network models.
	20MTOE322	NATURAL LANGUAGE PROCESSING	CO1:Outline the basic concepts of natural language processing
			CO2:Compare the key role of syntactic parsing and semantic

			analysis in natural language processing in unstructured data
			CO3:Employ language generation as a part of sentimental analysis
			CO4:Experiment the corpus for text analysis in natural language processing.
			CO5:Assess important statistical techniques used in natural language processing.
			CO6:Employ the knowledge of skills learnt in the course to solve the problems
	20MTOE323	COST MANAGEMENT OF ENGINEERING PROJECTS	CO1:Explain software cost management in engineering projects.
			CO2:Use Project evaluation techniques to the engineering projects.
			CO3:Compare Project Activity planning and resource breakdown structure.
			CO4:Develop the estimating models.
			CO5:Examine the risk in software environments.
			CO6:Use the Software quality metrics to test the software.
	20MTAI303P	PROJECT WORK - I/INTERNSHIP	CO1:Employ the concepts of the domain knowledge of the project work done to solve the real life problems.
			CO2:Compare the benefits of the tools and technologies suitable for an application.
			CO3:Examine the working model of the project for different inputs.
			CO4:Compare and contrast the methodologies
			CO5:Develop plans with relevant people to achieve the project's goals
			CO6:Assess the cost estimates of the project work
IV	**20MTAI401P**	PROJECT WORK – II AND DISSERTATION	CO1:Employ the concepts of the domain knowledge of the project work done to solve the real life problems.
			CO2:Compare the benefits of the tools and technologies suitable for an application.

			CO3:Examine the working model of the project for different inputs.
			CO4:Compare and contrast the methodologies
			CO5:Develop plans with relevant people to achieve the project's goals
			CO6:Assess the cost estimates of the project work