GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Internet of Things

Subject Code : ME02062101

Subject Name : Cognitive IoT

w. e. f. Academic Year:	2024-25
Semester:	2
Category of the Course:	Professional Elective Course

Prerequisite:	**Sensor, Data Acquit ion Techniques, IoT devices**
Rationale:	After completion of course student acquire knowledge of machine learning, deep learning and data mining and processing in the field of IoT

Course Outcome:

After completion of the Course, Students will be able to:

No	Course Outcomes	RBT Level*
01	Understand concept of Cognitive IoT	UN
02	Apply data mining algorithms for IoT	AP
03	Implement ML model for IoT application	AP
04	Analyze function of R programming for IoT	AN
05	Evaluate performance of ML algorithms	EL

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	02	04	70	30	30	20	150

Course Content:

Sr No	Course Content	No of Hours	% of Weightage
1	**UNIT I : Internet of Things:** IoT history, Architecture and Elements, Data Analytics, Data Processing, IoT Protocols, IoT Applications.	4	10
2	**UNIT 2 : Cognitive Internet of Things:** Cognitive Devices, Cognitive in IoT, CIoT background and elements, Man to machine communication, man to machine interface, Machine to web communication, CIoT applications.	7	15
3	**UNIT 3 : Data Mining in IoT:** Search Engines, Data Creation and Retrial Scheme, Data Mining, Data Mining in IoT, Machine Learning in IoT.	7	15
4	**UNIT 4: Machine Learning Techniques:** Tools to Implements Machine Learning, Experiments, Supervised and Unsupervised Learning, Classification, Regression, Clustering.	9	20
5	**UNIT 5: Machine Learning Models:** Introduction, Generalizing Input and Output, Classification Rules, Numeric Prediction, Instance Based Learning, Linear Method for Regression, Linear Method for Classification, Kernel Smoothing Model, Back Propagation, Neural Network, Bayesian Methods.	9	20
6	**UNIT 6: Data Processing:** Input preparation, Data Preprocessing, Data Cleaning, Feature Selection, Feature Reduction, Bagging and Boosting Techniques, Ensemble Approach.	9	20
	TOTAL	**45**	**100**

Reference Book:

- "Machine Learning in Cognitive IoT", Neeraj Kumar and Aaisha Makkar, CRC group, Taylor and Fransis Group.
- "Machine Learning for Decision Makers-Cognitive Computing Fundamentals for Decision Makers", Patanjali Kashyap, Apress Publications.
- "Towards Cognitive IoT Networks", Mohammad Abdul Matin, Springer.

- "Cognitive Computing for Big Data Systems Over IoT - Frameworks, Tools and Applications", , Arun Kumar Sangaiah, Arunkumar Thangavelu, Venkatesan Meenakshi Sundaram, Springer.

Suggested Course Practical List:

- The practical work will be carried out based on the content covered during the academic session.

List of Laboratory/Learning Resources Required:

- List of Hardware: NIL
- List of Software: NIL
- List of Open Source Tools/Simulator: NIL
- List of Useful websites/MOOCs: NIL

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