CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
Kandlakoya, Hyderabad – 501 401

B.Tech. Minor Degree in Artificial Intelligence & Machine Learning (AIML) – Course Structure Regulation-18

V SEMESTER (III YEAR I SEMESTER)

Course Code	Title of the Course	L	T	P	Contact Hours/ Week	Credits
A36635	Foundations of Artificial Intelligence	3	0	0	3	3
A36636	Artificial Intelligence Laboratory	0	0	3	3	1.5
Total		**3**	**0**	**3**	**6**	**4.5**

VI SEMESTER (III YEAR II SEMESTER)

Course Code	Title of the Course	L	T	P	Contact Hours/ Week	Credits
A36637	Artificial Intelligence Applications	4	0	0	4	4
Total		**4**	**0**	**0**	**4**	**4**

VII SEMESTER (IV YEAR I SEMESTER)

Course Code	Title of the Course	L	T	P	Contact Hours/ Week	Credits
	(Either online through MOOCS or off-line Class)	3	0	0	3	3
A36638	Machine Learning					
A36640	Deep Learning					
	(corresponding Lab offline)	0	0	3	3	1.5
A36639	Machine Learning Laboratory					
A36641	Deep Learning Laboratory					
Total		**3**	**0**	**3**	**6**	**4.5**

VIII SEMESTER (IV YEAR II SEMESTER)

Course Code	Title of the Course	L	T	P	Contact Hours/ Week	Credits
A36642	Robotics Process Automation					
A36643	Natural Language Processing					
A36644	Computer Vision					
A36645	Soft and Evolutionary computing	3	0	0	3	3
A36646	Mini-Project	0	0	4	4	2
Total		**3**	**0**	**4**	**7**	**5**
Total Credits						**18**
NOTE: Above subjects not studied in regular B. Tech. course						

(A36635)FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

B.Tech. Minor (AIML) **III Year I Sem.**

L	T	P	C
3	0	0	3

UNIT - I

Defining Artificial Intelligence, Defining AI techniques, Using Predicate Logic and Representing Knowledge as Rules, Representing simple facts in logic, Computable functions and predicates, Procedural vs Declarative knowledge, Logic Programming,

UNIT - II

Mathematical foundations: Matrix Theory and Statistics for Machine Learning. Idea of Machines learning from data, Classification of problem – Regression and Classification, Supervised and Unsupervised learning.

UNIT - III

Linear Regression: Model representation for single variable, Single variable Cost Function, Gradient Decent for Linear Regression, Gradient Decent in practice.

UNIT - IV

Logistic Regression: Classification, Hypothesis Representation, Decision Boundary, Cost function, Advanced Optimization, Multi-classification (One vs All), Problem of Overfitting.

UNIT - V

Discussion on clustering algorithms and use-cases centered around clustering and classification.

TEXT BOOKS:

1. Artificial Intelligence, Cengage Learning, Saroj Kaushik, 1st Edition, 2011
2. Python Machine Learning by Example, Yuxi (Hayden) Liu, Packet PublishingLimited, 2017
3. Machine Learning, Saikar Dutt, Subramanian Chandramouli, Amit Kumar Das,Pearson India

REFERENCES:

1. Practical Workbook Artificial Intelligence and Soft Computing for Beginners,Anindita Das Bhattacharjee, Shroff Publisher-X team Publisher
2. Machine Learning, Tom Mitchell, McGraw Hill, 2017
3. Pattern Recognition and Machine Learning, Christopher M. Bishop, Springer, 2011
4. The Elements of Statistical Learning, T. Hastie, R. Tibshirani, J. Friedman, 2nd Edition,2011

Corresponding Online Resources:

1. Artificial Intelligence, https://swayam.gov.in/nd2_cec20_cs10/preview.

Course Outcomes: After completion of course, students would be able to:

1. Design and implement machine learning solutions to classification, regression andclustering problems.
2. Evaluate and interpret the results of the different ML techniques.
3. Design and implement various machine learning algorithms in a range of Real-worldapplications.

(A36636)ARTIFICIAL INTELLIGENCE LABORATORY

B.Tech. Minor (AIML) **III Year I Sem.**

L	T	P	C
0	0	3	1.5

LIST OF EXPERIMENTS:

Week-1 & 2:
Basic programs in Python to get familiarize various programming structures
Week - 3:
Implementation of logical rules in Python
Week - 4, 5, 6 & 7:
Using any data apply the concept of:
a. Liner regression
b. Gradient decent
c. Logistic regression
Week - 8:
Perform and plot overfitting in a data set
Week - 9 &10:
Implementation of KNN classification algorithm
Week - 11 &12:
Implementation of k-means clustering algorithm
Week - 13:
Explore statistical methods for machine learning

TEXT BOOKS:

1. Artificial Intelligence, Cengage Learning, Saroj Kaushik, 1st Edition, 2011
2. Python Machine Learning by Example, Yuxi (Hayden) Liu, Packet PublishingLimited, 2017
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The Elements of Statistical Learning, T. Hastie, R. Tibshirani, J. Friedman, 2e, 20

(A36637)**Artificial Intelligence Applications**

B.Tech. Minor (AIML) III Year II Sem.

L	T	P	C
4	0	0	4

UNIT - I

Linguistic aspects of natural language processing, A.I. And Quantum Computing, Applications of Artificial Intelligence (AI) in business.

UNIT - II

Emotion Recognition using human face and body language, AI based system to predict the diseases early, Smart Investment analysis, AI in Sales and Customer Support.

UNIT - III

Robotic Processes Automation for supply chain management.

UNIT - IV

AI-Optimized Hardware, Digital Twin i.e. AI Modelling, Information Technology &Security using AI.

UNIT - V

Recent Topics in AI/ML: AI/ML in Smart solutions, AI/ML in Social Problems handling,Block chainand AI.

TEXT BOOKS:

1. Sameer Dhanrajani, AI and Analytics, Accelerating Business Decisions, John Wiley &Sons.
2. Artificial Intelligence in Practice: How 50 Successful Companies Used AI andMachineLearning to Solve Problems, Bernard Marr, Matt Ward, Wiley.

REFERENCE BOOKS:

1. Life 3.0: Being Human in the Age of Artificial Intelligence by Max Tegmark, 2018.
2. Homo Deus: A Brief History of Tomorrow by Yuval Noah Harari, 2017