GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: BE Minor/Hons.

Level: UG

Branch: Artificial Intelligence and Machine Learning

Course / Subject Code : BE04IAN011

Course / Subject Name: Introduction to AI & ML

w. e. f. Academic Year:	2024-2025
Semester:	4th
Category of the Course:	**Core Course**

Prerequisite:	Understanding of basic computer operations and internet usage, basic statistical concepts and methods
Rationale:	These topics are structured to provide a progressive learning experience, starting with foundational knowledge suitable for beginners, building on the basics for those with some prior knowledge, delving into advanced technical aspects for learners with a solid understanding, offering in-depth knowledge and practical skills for experts, and tailoring content for professionals looking to apply AI in their respective fields. Additionally, they provide a comprehensive understanding for learners who want a broad and detailed knowledge of AI and related technologies.

Course Outcome:

After Completion of the Course, Student will be able to:

No	Course Outcomes	RBT Level
01	Understand AI Technical Overview	U
02	Realize AI's Importance in Business	E
03	Explore Different AI Platforms	N
04	Learn about Deep Learning and its Impact	A
05	Identify Computer Vision Use Cases and Concepts	C
06	Comprehend Data Science Essentials and RPA Importance	U

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme: (Not applicable, self-paced course)

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
4	0	0	4	100	0	0	0	100

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**Embracing Next Gen Technologies-**Introduction to Cloud Computing, Introduction to Big Data, Introduction to AI and ML, Introduction to IoT and Mixed Reality, Introduction to Cybersecurity	10	16
2.	**Introduction to Artificial Intelligence- Overview of AI and ML** - Definitions and differences, Data Science, **Learning Methods-** Supervised Learning, Unsupervised Learning, Classification, Regression, Clustering, **Natural Language Processing (NLP)**, **AI Applications and Case Studies** , Business Opportunities and Value, AI in Retail, Healthcare, Banking, Manufacturing, Energy, **Technical Aspects of AI** -History and Types of AI, Machine Learning Techniques (SVM, Decision Trees, KNN, Logistic Regression), AI Architecture and Platforms (Infosys NIA, AI Ecosystems), **Deep Learning** , Artificial Neural Networks (ANN), Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Auto-encoders, Business Applications and Case Studies, Deep Learning Frameworks and Products.	12	19.5
3.	**Computer Vision and NLP - Computer Vision 101** - Importance and Applications (Retail, Automotive, Healthcare, Agriculture etc.), Human Vision vs. Computer Vision, Key Concepts and Techniques, Tools and Platforms (Google, Microsoft, Infosys NIA), **Introduction to Natural Language Processing (NLP)** -Text Analytics, Speech Recognition, Machine Translation, Chatbots, Sentiment Analysis, POS Tagging, Applications and Trends in NLP.	12	19.5
4.	**Computer Vision 101-** Introduction, Applications of Computer Vision, Understanding Vision Systems, Concepts and Techniques, Tools and Platforms, Introduction to Natural Language Processing (NLP), Overview, Applications, Course Introduction, NLP Pipeline, Deep Learning for NLP, Tools and Platforms Introduction to Data Science, Overview, Learning Outcomes, Components of Data Science, Data Science in Action. **Introduction to python –** Basic of python, control structures, Programming basic and Functions.	13	20
5.	**Libraries and collections** – Collection in python, Libraries and built-in functions in python, Code organization files and exception handling – Modules and packages, file handling in python, Exception handling in python.	16	25
	Total	**63**	**100**

Suggested Specification Table with Marks (Theory): Given here tentative, which may vary as per Author and Course.

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
21%	**25%**	**21%**	**14%**	**11%**	**8%**

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

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