

M.L. Dahanukar College of Commerce (Autonomous)

Teaching Plan: 2025 - 26

Department: I.T.

Class: M.Sc. (I.T.)

Semester: III

Subject: Advanced Artificial Intelligence

Name of the Faculty: Gufran Kabil Qureshi

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	MODULE I: Advanced Artificial Intelligence Unit 1: Foundations of Artificial Intelligence Introduction to Artificial Intelligence		04
July	<ul style="list-style-type: none">• Intelligent Agents• Problem-solving using search algorithms• Knowledge Representation Unit 2: Advanced Artificial Intelligence <ul style="list-style-type: none">• Introduction to advanced AI concepts• Deep learning and neural networks• Natural language processing and understanding		16
August	<ul style="list-style-type: none">• Reinforcement learning• AI applications in various domains such as healthcare, finance, and robotics MODULE II : Unit 3: Machine Learning <ul style="list-style-type: none">• Machine Learning Paradigms: Machine Learning systems, supervised and un-supervised learning, inductive learning, deductive learning, clustering, support vector machines, case based reasoning and learning.		16
September	<ul style="list-style-type: none">• Artificial Neural Networks: Artificial Neural Networks, Single-Layer feedforward networks, multi-layer feed-forward networks, radial basis function networks, design issues of artificial neural networks and recurrent networks Unit 4 Generative AI <ul style="list-style-type: none">• Introduction to generative AI and its applications• Generative adversarial networks (GANs)		14
October	<ul style="list-style-type: none">• Variational autoencoders• Text generation and image synthesis using generative AI• Ethical considerations in generative AI		10

Sign of Faculty

Sign of Coordinator

M.L. Dahanukar College of Commerce (Autonomous)

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Department: I.T.

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Semester: III

Subject: Machine Learning

Name of the Faculty: Hina Mahmood

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Introduction to Machine Learning, General Principles in Machine Learning, Advanced Topics in Machine Learning,		3
July	Mathematical Foundation: Probability and Statistics, Information Theory, Mathematical Optimization Classification Algorithms, Feature Extraction ,Discriminative Models		9
August	Generative Models , Unimodal Models Domain-Based Machine Learning Applications, Ethical Aspects of Machine Learning, Mixture Models, Entangled Models		9
September	Bayesian Learning, Graphical Models, Domain-Based Machine Learning Applications, Ethical Aspects of Machine Learning		9

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M.L. Dahanukar College of Commerce (Autonomous)

Teaching Plan: 2025 - 2026

Department: I.T.

Class: M.Sc.(I.T.) Part II

Semester: III

Subject: Natural Language Processing

Name of the Faculty: Pooja Amin

Month	Topics to be Covered	Internal Assessment	Number of Lectures
June	Unit I a) Introduction to NLP: Brief history, NLP applications, Challenges/Open Problems, NLP Abstraction levels, Introduction to NL computing techniques and steps (segmentation, tagging, parsing, etc.) b) NLP Tasks: Segmentation, Chunking, Tagging, Named Entity Recognition (NER), Parsing, Word Sense Disambiguation, NL Generation, Text Processing Challenges		04
July	Unit II a) Morphological Analysis and Regular Expressions: Introduction to Morphology, Types of morphological parsing: rule-based vs. paradigm-based, Regular Expressions Automata Finite State Automata (FSA) and Finite State Transducers (FST), Introduction to the Porter stemming algorithm. b) Part-of-Speech (POS) Tagging and Evaluation: Word Classes and Introduction to POS Tagging, Survey of POS tagsets in English and Indian languages, Introduction to rule-based approaches like ENG TOWL, Stochastic Approaches: Overview of probabilistic models, N-gram models, and Hidden Markov Models (HMM) for POS tagging, Transformation-Based Learning (TBL) Morphology, Evaluation Metrics and Error Analysis: Precision, Recall, F-measure, error-analysis		12

August	<p>Unit III</p> <p>a) NL Parsing Basics and Grammar Formalisms: Introduction to NL Parsing (top-down and bottom-up parsing approaches), Introduction to constituency and dependency schools of grammar Overview of grammar notations: CFG, LFG, PCFG, LTAG, Overview of English CFG, Introduction to Paninian Karaka Theory for Indian language parsing, Overview of CFG parsing using Earley's and CYK algorithms, Introduction to Paninian Karaka Theory for Indian language parsing, Overview of CFG parsing using Earley's and CYK algorithms.</p> <p>b) Probabilistic Parsing and Dependency</p>		12
September	<p>Parsing: Introduction to probabilistic parsing techniques, Overview of probabilistic CFG (PCFG) and its applications, dependency parsing and its importance, Overview of Covington algorithm, MALT parser, and MST parser for dependency parsing.</p> <p>Unit IV</p> <p>a) Lexical Semantics and Word Senses: Introduction to semantic analysis theories and methodologies, lexical semantics, word senses, and relationships, Introduction to WordNet for English and IndoWordnet, Overview of WSD techniques like Lesk Algorithm and Walker's algorithm, Importance of WSD in resolving ambiguity in NLP.</p> <p>b) Coreference Resolution and Semantic Representations: coreference resolution, including Anaphora and Cataphora, Importance of resolving coreference in NLP applications, Semantic Representations and Word Similarity and understanding lexical semantics.</p>		15

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