

Shastri III Year-V Semester

AEEC – 3

Course Name: ARTIFICIAL INTELLIGENCE & NATURAL LANGUAGE PROCESSING

Objective: The objectives of this introductory course in Artificial Intelligence, Natural Language Processing, and Computational Linguistics are to familiarize students with foundational concepts and techniques in analyzing and processing natural language text.

Learning Outcomes: students will demonstrate an understanding of fundamental concepts in Artificial Intelligence, Natural Language Processing, and Computational Linguistics, along with the ability to apply basic techniques to analyze and process natural language text effectively.

Theory :60Marks

Internal Assessment :40 Marks

Unit	Topic	Hours	Credits (2)
1	Introduction to Artificial Intelligence: What is Artificial Intelligence? AI Technique, Level of the Model, Problem Spaces, and Search: Defining the Problem as a State Space Search, Production Systems, Problem Characteristics, AI applications. Introduction to NLP: Introduction to NLP: Levels: (Characters, Morpheme, Word, Sentence, Discourse), Encoding (Unicode, ASCII), Transliteration: Schemes (IAST, ISO15919, etc.), Morphological analysis and generation, Compound analysis and generation (Practical)	15	01 Credit
2	Machine Translation: Machine Translation: Rule-based MT, ML-based (Sequence to Sequence) Paninian Concepts, Introduction to Computational Tools for Sanskrit. Introduction to Computational Linguistics: State of art in Computational Linguistics, Speech/speaker recognition, speech synthesis. text-to-speech, Language analysis, understanding, generation, Natural Language Interface, Text Processing, and Knowledge representation.	15	01 Credit

Reference Books-

1. Akshar Bharti, Vineet Chaitanya, Rajeev Sanghal, Natural Language Processing a Paninian Perspective, PHI Learning Private Limited, 2022
2. Grosz, Barbara J. (et al.) *Readings in NLP*, (ed.) LA: Morgan Kaufmann, 1990
3. Bharti A., R. Sangal, V. Chaitanya, "NL, Complexity Theory and Logic" in Foundations of Software Technology and Theoretical Computer Science, Springer, 1990.
4. Elaine Rich, Kevin Knight, & Shivashankar B Nair, Artificial Intelligence, McGraw Hill, 3rd ed., 2009
5. Introduction to Artificial Intelligence & Expert Systems, Dan W Patterson, PHL, 2010
6. S Kaushik, Artificial Intelligence, Cengage Learning, 1st ed. 2011

