Semester: 6th				
Paper code: AIML316T		L	T/P	Credits
Subject: Natural Language Processing		3	0	3
Marking Scheme				
1. Teachers Continuous Evaluation: As per university examination norms from time to time				
2. End term Theory Examination: As per university examination norms from time to time				
INSTRUCTIONS TO PAPER SETTERS: Maximum Marks: As per university norms				
1. There should be 9 questions in the end term examination question paper.				
2. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions.				
3. Apart from Question No. 1, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, students may be asked to attempt only 1 question from each unit.				
4. The questions are to be framed keeping in view the learning outcomes of course/paper. The standard/ level of the questions to be asked should be at the level of the prescribed textbooks.				
5. The requirement of (scientific) calculators/ log-tables/ data-tables may be specified if required.				
Course Objectives:				
1	To introduce the basic principles, techniques, and applications of Natural Language Processing			
2	To provide an understanding of the basic phases of natural language processing like morphological analysis, syntactic analysis, semantic analysis, pragmatic analysis			
3	To teach latest tools and techniques for NLP like WordNet			
4	Address the issues of natural languages like ambiguities			
Course Outcomes:				
CO1	Understand the basics of the analysis of natural language input			
CO2	Analyse the concept of semantic and syntactic analysis			
CO3	To understand the applications of NLP in day-to-day life using WordNet			
CO4	Identify issues and challenges in natural language processing including ambiguities			

Course Outcomes (CO) to Programme Outcomes (PO) Mapping

(Scale 1: Low, 2: Medium, 3: High)

CO/PO	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO1	1	1	1	1	1	1	-	1	-	-	-	1
CO2	2	2	1	1	2	1	-	-	-	-	-	2
CO3	2	2	1	1	3	1	-	-	-	-	-	2
CO4	2	2	2	2	1	1	1	1	1	1	1	2

Course Overview:

This course aims at teaching the basics about processing of Natural Languages. Natural language processing is the feature of 5th Generation Computer and is part of Artificial intelligence. It teaches about the different phases of natural language processing, methodologies, algorithms,

data structures used for Natural Language Processing.

UNIT 1:   **[10]**
Introduction: Basic concepts of Natural Language Processing, origins and evolution of NLP, language and knowledge, issues and challenges in NLP, Types of ambiguities, Word and non-word errors, Phases of Natural Language Processing.

UNIT 2:   **[10]**
Key Components: Basics of morphological analysis, syntactic analysis, semantic analysis, and pragmatic analysis. Data Pre-Processing. Text tokenization. Part of Speech Tagging (POST). POS Taggers. Case study of parsers of NLP systems: ELIZA, LUNAR.

UNIT 3:   **[10]**
Tools and Techniques: Word-to-Vec conversion. Term Frequency-Inverse Document Frequency. FrameNet. English WordNet and Indian WordNet. Components of WordNet. Semantic analysis using WordNet. Understanding Natural Language Tool Kit (NLTK) tool for using WordNet. NLP and Indian languages.

UNIT 4:   **[10]**
Applications of NLP: Word Sense Disambiguation, Text Summarization, Optical Character Recognition, Sentiment Analysis and Opinion Mining, Chatbots and Voice Assistants, Automated Question Answering, Machine Translation.

Text Books:
1) Bird S, Klein E, Loper E. Natural language processing with Python: analyzing text with the natural language toolkit. " O'Reilly Media, Inc."; 2009.
2) Thanaki J. Python natural language processing. Packt Publishing Ltd; 2017.

Reference Books:
1) Hardeniya N, Perkins J, Chopra D, Joshi N, Mathur I. Natural language processing: python and NLTK. Packt Publishing Ltd; 2016.
2) Srinivasa-Desikan B. Natural Language Processing and Computational Linguistics: A practical guide to text analysis with Python, Gensim, spaCy, and Keras. Packt Publishing Ltd; 2018.