

[6]. Robert V.Binder, " Testing Object-Oriented Systems: Models Patterns and Tools ", Addison Wesley, 2000.

<b>Devi Ahilya University, Indore, India</b>				<b>II Year M.E. (Computer Engineering Sp. in Software Engineering )</b>			
<b>Institute of Engineering &amp; Technology</b>				<b>(Part Time)</b>			
<b>Subject Code &amp; Name</b>	<b>Instructions Hours per Week</b>			<b>Credits</b>			
<b>SEP4E4</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Total</b>
<b>Speech andLanguageProcessing</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>5</b>
<b>Duration of Theory Paper: 3 Hours</b>							

**Objective:** To gain the knowledge for developing advanced technology of computer systems like speech recognition and machine translation.

**Prerequisite:** Discrete structures, Finite automata, information retrieval and Context-free Grammar

### **COURSE CONTENTS**

#### **UNIT I**

Natural Language Processing, Applications, Ambiguity, Morphology, Parsing with Finite State Transducers, Regular Expressions, Stemmer, Spelling errors.

#### **UNIT II**

Computational Phonology: speech sound, phonetic transcription, text to speech; Pronunciation Variations, Bayesian Method to spelling and pronunciations, Minimum Edit Distance, Weighted Automata, N-grams.

#### **UNIT III**

HMM and speech recognition, Viterbi algorithm, Acoustic processing of speech, Feature Extraction, Speech Synthesis; Part-of-Speech Tagging: rule based, stochastic, transformation based.

#### **UNIT IV**

Syntax Processing: Parsing with CFG, CKY parsing and the Earley parser, Probabilistic parsing; Semantic Processing: Meaning representation, First Order Predicate Calculus. Lexical Semantics: Internal structure of words, thematic roles, Primitive decomposition, WordNet.

#### **UNIT V**

Word sense disambiguation; Information Retrieval: Vector space model, Improving user queries; Pragmatic Processing: Discourse; Natural Language Generation, Machine Translation.

#### **TEXTBOOKS:**

- [1] D. Jurafsky and J.H. Martin; Speech and Language Processing; Processing; Prentice Hall; 2000.
- [2] 2. C. Manning and H. Schutze, "Foundations of Statistical Natural Language Processing",
- [3] James Allen. "Natural Language Understanding", Addison Wesley, 1994.

**List of Assignment in NLP Lab:**

- Problem based on Stemming Algorithm.
- Problem based on Part of Tagging.
- Problem based on Parsing.
- Problem based on Information Retrieval.
- Case study on Different NLP Techniques
- Cricket Game Prediction.
- Machine Translation from English-Hindi.
- Query Expansion for Information Retrieval.
- Emotion detection for texts.
- Any other problem based on emerging trends in speech & language processing.