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| **Subject Name:** | | | | | | | | | | Natural Language Processing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **Subject Code:** | | | | | | | | | | TM3 403 (2) | | | | | | | | |
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| **Course Name:** | | | | | | | | | | Master of Computer Applications (MCA) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | |  | | | | | | | | |
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| **1** | **Contact Hours:** | | | | | | | | | | | | | 45 | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | **L** | | 3 | | | | | | | **T** | | | | 0 | **P** | 0 |
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| **2** | **Examination Duration(Hrs):** | | | | | | | | | | | | | | | | | | | | | | | |  | **Theory** | | | | | | | 0 | 3 |  | **Practical** | | | | | | | | 0 | | | 0 | | | |  | | | | | | | |
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| **3** | **Relative Weightage:** | | | | | | | | | | | | | | |  | | | | | | **CWE:** | | | | | | | | | 25 | | **MTE:** | | | | | 25 | | | | **ETE:** | | | | 50 | | | | | | | | |  | | | |
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| **4** | **Credits:** | | | | | | | 0 | | | 3 | | |  | | | | | | | | | | | | | |  | | | |  | | | | |  | | | |  | | | |  | | | | | | | | |  | | | | |
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| **5** | **Semester:** | | | | | | | |  | | | |  | | | | | \* | | |  | | |  | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | | | | **Autumn** | | | | | | | | **Spring** | | | | | | | | **Both** | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **6** | **Pre-Requisite:** | | | | | | | | | | | | | Basics of Automata Theory | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **7** | **Subject Area:** | | | | | | | | | | | | | Computer Science | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **8** | **Objective:** | | | | | | | | | | | To teach the students various concepts of NLP. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **9** | **Course Outcome:** | | | | | | | | | | | | | | | | After completion of the course students will be able to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 1** | | | | | Classify the elements of Natural Language Processing (NLP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 2** | | | | | Describe and compare various parsing approaches used in NLP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 3** | | | | | Analyze and Design the grammars to check the syntax and semantics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 4** | | | | | Apply the different machine learning approaches in NLP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 5** | | | | | Apply and evaluate different NLP strategies in Bigdata | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **CO 6** | | | | | Compare and apply the tools for NLP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **10** | | **Details of the Course:** | | | | | | | | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Unit No.** | | | | **CONTENT** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **CONTACT HOURS** | | | | | | | | | | |
| **1** | | | | Introduction to Natural Language Understanding: Overview, Applications of NLP, Evaluating Language Understanding Systems, Different levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, NLP and Big Data. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9** | | | | | | | | | | |
| **2** | | | | Introduction to semantics and knowledge representation, Some applications like machine translation, database interface. Grammars and Parsing: Grammars and sentence Structure, Top-Down and Bottom-Up Parsers, Transition Network Grammars, Top-Down Chart Parsing. Feature Systems and Augmented Grammars: Basic Feature system for English, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9** | | | | | | | | | | |
| **3** | | | | Grammars for Natural Language: Auxiliary Verbs and Verb Phrases, Movement Phenomenon in Language, Handling questions in Context-Free Grammars. Human preferences in parsing, encoding uncertainty, Deterministic Parser. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9** | | | | | | | | | | |
| **4** | | | | Ambiguity Resolution: Statistical Methods, Probabilistic Language Processing, Estimating Probabilities, Part-of-Speech tagging, Obtaining Lexical Probabilities, Probabilistic Context Free Grammars, Best First Parsing. Semantics and Logical Form, Word senses and Ambiguity, Encoding Ambiguity in Logical Form | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9** | | | | | | | | | | |
| **5** | | | | Methods and tools of NLP analysis: Extracting and collecting information from Twitter, Facebook and Internet pages; Sentiment analysis using big data; Developing a recommender systems. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **9** | | | | | | | | | | |
|  | | | | **TOTAL** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **45** | | | | | | | | | | |
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| **11** | | **Suggested Books:** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | | | | | | | | | |
| **Sl. NO.** | | | **NAME OF AUTHORS/BOOKS/PUBLISHERS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | **YEAR OF PUBLICATION** | | | | | | |
| **1** | | | James Allen,” Natural Language Understanding”, 2/e, Pearson Education | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2003 | | | | | | |
| **2** | | | D. Jurafsky, J. H. Martin, “Speech and Language Processing”, Pearson Education | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2002 | | | | | | |
| **3** | | | Charu C. Agarwal, “Recommender system: The Textbook”, 1/e, Springer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2016 | | | | | | |