Course Information

MSAI532 - M51 Natural Language Processing  
Spring 2025 Full Term  
Course Format: Hybrid  
CRN: 2025-SPRING-MAIN-MSAI-532-M51  
Class Time and Location: Dallas Campus | Friday/Saturday/Sunday | 8:00 AM - 10:00 PM | 01/31/2025 - 02/02/202  
 

Instructor Information

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Email: toni.farley@ucumberlands.edu

Phone: use email

Office Location: remote

Office Hours/Preferred Contact Times: Sundays, 2-3 PM Pacific Time

Course Description

This course explores the fundamental principles, advanced techniques, and practical applications of Natural Language Processing. Students will progress from foundational concepts to hands-on implementation, addressing real-world challenges in various domains such as information retrieval, sentiment analysis, and machine translation.

Course Objectives

Upon completion of this course:

Understand the fundamental concepts and significance of Natural Language Processing (NLP) in the context of artificial intelligence and data analysis.

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Apply various text preprocessing techniques to clean and prepare unstructured text data for NLP tasks.

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Utilize different types of word embeddings to represent words and documents numerically, enabling effective machine learning on text data.

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Implement and evaluate sentiment analysis models to classify emotions and opinions present in text data

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Design and develop sequence-to-sequence models using encoder-decoder architectures for tasks like machine translation and text summarization.

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Demonstrate awareness of ethical considerations in NLP, including potential algorithm biases and strategies to mitigate them, ensuring responsible NLP application development

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Learner Outcomes

Introduction to AI & NLP (8.1 – 8.3 ) NLP in AI

Investigate basic Business Intelligence (BI).

Clean and Prepare Data (Chapter 22) NLP in AI

Identify strengths and weaknesses of social medial intelligence tools.

Apply Neural Machine Translation (NMT) (3.4 – 3.7) NLP in AI

Evaluate social media platform ethics in decision concepts.

4c. Advanced Algorithms (7.5 -7.9) NLP in AI

Evaluate and describe steps and key terms of NLP.

Apply Machine Translations pt.2 (25.5 – 25.8) S & LP

Determine how data can be used to benefit and exploit communities

Analyze social media platforms.

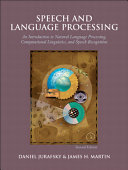
Demonstrate translation techniques and interpretation of parse trees.

Develop dependency and case structures

Course Website

Access to the course website is required via the iLearn portal on the University of the Cumberlands website:<http://www.ucumberlands.edu/ilearn/>  or <https://ucumberlands.blackboard.com/>

Required Books and Resources

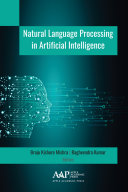


Title: Speech and Language Processing, 2nd Edition

ISBN: 9780133252934

Authors: Dan Jurafsky, James H. Martin

Publisher: Prentice Hall



Title: Natural Language Processing in Artificial Intelligence

ISBN: 9781000711691

Authors: Brojo Kishore Mishra, Raghvendra Kumar

Publisher: CRC Press

Publication Date: 2020-11-01

To access your course materials, simply click on the Course Materials link located in the left menu of your course in iLearn.

Course Schedule

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| --- | --- | --- | --- |
| **Week #** | **Topics/Readings** | **Assignment Names and Points** | Due dates |
| **1** | *Natural Language Processing in Artificial Intelligence*Chapter 1 (1.1 – 1.4). | Assignment 1 (30) | 1/12/25 |
| **2** | *Natural Language Processing in Artificial Intelligence*Chapter 1 (1.5 – 1.7). | Discussion (10) | 1/19/25 |
| **3** | *Natural Language Processing in Artificial Intelligence*Chapter 10 (1.1 – 1.3). | Assignment 2 (30) | 1/26/25 |
| **4** | *Natural Language Processing in Artificial Intelligence*Chapter 10 (1.4 – 1.7). | Assignment 3 (30) | 2/2/25 |
| **5** | *Natural Language Processing in Artificial Intelligence*Chapter 3 (1.1 – 1.3). | Assignment 4 (30) | 2/9/25 |
| **6** | *Natural Language Processing in Artificial Intelligence*Chapter 3 (1.4 – 1.7). | Discussion (10) | 2/16/25 |
| **7** | *Speech and Language Processing*Chapter 25 (25.1 – 25.6). | Assignment 5 (30) | 2/23/25 |
| **8** | Speech and Language Processing Chapter 25 (25.7 – 25.12). | Assignment 6 (30) | 3/2/25 |
| **9** | *Speech and Language Processing*Chapter 25 (5.1 – 5.4). | Assignment 7 (30) | 3/9/25 |
| **10** | *Speech and Language Processing*Chapter 25 (5.5 – 5.9). | Assignment 8 (30) | 3/16/25 |
| **11** | *Natural Language Processing in Artificial Intelligence*Chapter 6 | Assignment 9 (30) | 3/23/25 |
| **12** | *Speech and Language Processing*Chapter 22. | Discussion (10) | 3/30/25 |
| **13** | *Natural Language Processing in Artificial Intelligence*Chapter 7 (7.1 – 7.4). | Discussion (10) | 4/6/25 |
| **14** | *Natural Language Processing in Artificial Intelligence*Chapter 7 (7.5 – 7.9). | Assignment 10 (30) | 4/13/25 |
| **15** | *Natural Language Processing in Artificial Intelligence*Chapter 7 (8.1 – 8.3). | Assignment 11 (30) | 4/20/25 |
| **16** | *Natural Language Processing in Artificial Intelligence*Chapter 7 (8.4 – 8.5). | Assignment 12 (30) | 4/25/25 |
| **Residency**  **Weekend** |  | Projects (2 @ 100, 1 @ 150, 1 @ 200 points)  Practical Connection Assignment (50 points)  Total Residency: 600 points | 1/31/25 - 2/2/25 |