



Computer Science Department
Course Syllabus
CS465 - Natural Language Processing

Catalog Description: Natural Language Processing or Computational Linguistics is a multidisciplinary field that draws from linguistic and computer science, particularly artificial intelligence, statistics and signal processing.

This course provides a variety of ways to represent human languages as computational linguistics to exploit those representations to develop programs that treats spoken (Automatic speech recognition and text to speech) written languages.

The course covers computational treatments of words, sounds, sentences, meanings, dialogs and conversations. These treatments will help to learn how to create systems that can understand and produce language, for applications such as information extraction, machine learning, machine translation, automatic summarization, question-answering, and interactive dialogue systems.

Credit Hours: **3 Credit hours:** 3 Lectures per week 0 Labs. per week 0 Recitation per week

Prerequisites: CS340

Course Learning Outcomes:

1. Be able to describe the architecture of and basic design for a generic NLP system
2. Ability to discuss the current and likely future performance of several NLP applications, such as machine translation and email response.
3. Be able to describe briefly a fundamental technique for processing language for several subtasks, such as morphological analysis, parsing, word sense disambiguation etc.
4. Be able to describe basic understanding of Grammar, Syntax, Semantics and Pragmatics.
5. Be able to describe the difference between Speech Recognition and NLP, and their relationship, fundamental techniques used for Automated Speech Recognition (ASR) and Text-to-Speech (TTS).
6. Understand what Machine Learning (ML) is and how it is used in various areas of NLP.
7. Understand the basics of Machine Translation (MT).
8. Understand how these techniques draw on and relate to other areas of (theoretical) computer science, such as formal language theory, formal semantics of programming languages, or theorem proving (we may skip this and add it to the Graduate course

Major Topics:

- Introduction
- Introduction to ASR
- Finite-state techniques
- Prediction and part-of-speech tagging
- Parsing and generation



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- Parsing with constraint-based grammars
- Constraint-based grammar, unification
- Compositional and lexical semantics
- Discourse and dialogue
- Applications

Text Books: Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition, Jurafsky and Martin, 2nd edition, Prentice Hall, 2009.

Grading: © The grading scale for this course is:

- . 95 - 100 A+ Passing
- . 90 - 94 A Passing
- . 85 - 89 B+ Passing
- . 80 - 84 B Passing
- . 75 - 79 C+ Passing
- . 70 - 74 C Passing
- . 65 - 69 D+ Passing
- . 60 - 64 D Passing
- . 0 - 59 F Failing

© Final grades will be determined based on the following components:

- . 60% Semester Work
- . 40% Final Exam

© Students may not do any additional work for extra credit nor resubmit any graded activity to raise a final grade.

© Late submissions will not be accepted for any graded activity for any reason.

© Students have one week to request the re-grading of any semester work.

Attendance Policy: Students should attend 80% of the overall course hours taught in the semester as per the University regulations.

If a student fails to achieve this portion, he/she shall not be allowed to appear in the final exam and shall be awarded "DN" grade and repeat the course.



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**Cheating and
Plagiarism
Policy:**

The instructor will use several manual and automated means to detect cheating and/or plagiarism in any work submitted by students for this course.

When a student is suspected of cheating or plagiarism, the instructor raises the issue to the disciplinary committee.

Communications:

Registered students will be given access to a section of the Blackboard Learning System for this course. Bb will be used as the primary mechanism to disseminate course information, including announcements, lecture slides, assignments, and grades.

Communication with the instructor on issues relating to the individual student should be conducted using CIS email, via telephone, or in person.