

# The Hebrew University of Jerusalem

Syllabus

# Natural Language Processing - 67658

Last update 01-09-2022

<u>HU Credits:</u> 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Computer Sciences

<u>Academic year:</u> 0

<u>Semester:</u> 1st Semester

<u>Teaching Languages:</u> Hebrew

<u>Campus:</u> E. Safra

Course/Module Coordinator: Omri Abend

Coordinator Email: omri.abend@mail.huji.ac.il

Coordinator Office Hours:

Teaching Staff:

## Prof Omri Abend

#### Course/Module description:

Natural Langue Processing (NLP) addresses the automatic analysis of text and speech, and interfaces with various fields such as formal languages, machine learning, linguistics and cognitive psychology. It also has a variety of applications, e.g., in machine translation, information retrieval, and human-computer interaction. The course will present the main challenges the field is facing and (mostly statistical) techniques for addressing them.

#### Course/Module aims:

Acquaintance with the main problems of the field, its existing capabilities and hands-on experience in implementing them.

Learning outcomes - On successful completion of this module, students should be able to:

Implement basic techniques in Natural Language Processing, and get a basic understanding of the current literature in the field.

<u>Attendance requirements(%):</u> 75

*Teaching arrangement and method of instruction: Oral presentations, accompanied by theoretical and programming exercises.* 

Course/Module Content:

1. Language models, smoothing and neural language models

- 2. Bag of words models
- 3. Log-linear models and feed-forward neural networks
- 4. Linear chain methods,

tagging, named entity recognition

- 5. Recurrent neural networks
- 6. Vector space models of semantics
- 7. Sentiment analysis
- 8. Syntactic parsing:

grammar-based and grammar-less methods

- 9. Information extraction and semantic role labeling
- 10. Transfer learning in NLP

## 11. Machine translation

# Required Reading:

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<u>Additional Reading Material:</u> https://web.stanford.edu/~jurafsky/slp3/

<u>Course/Module evaluation:</u> End of year written/oral examination 70 % Presentation 0 % Participation in Tutorials 0 % Project work 0 % Assignments 30 % Reports 0 % Research project 0 % Quizzes 0 % Other 0 %

#### Additional information:

There will be five exercises (all mandatory). Some of them theoretical and some will involve programming.