Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
IT 534	Natural Language Processing	3	4	0	0	3	8

Prerequisites	
Admission Requirements	

Language of Instruction	English
Course Type	Compulsory
Course Level	Masters Degree
Objective	Introduce current aspects of the design and the implementation of computing systems that can process, understand, or communicate in human language. The course covers fundamental approaches, largely machine learning and deep learning, used across the field of NLP as well as a comprehensive set of NLP tasks both historical and contemporary. Problems range from syntax (part-of-speech tagging, parsing) to semantics (lexical semantics, question answering, grounding) and include various applications such as summarization, machine translation, information extraction, and dialogue systems. Assignments throughout the semester involve building scalable machine learning systems for various NLP tasks. Suggested Background: Data Structures and Algorithms, Linear Algebra, Introduction to Artificial Intelligence-Machine Learning .
Content	Week 1: Introduction to NLP, Regex, Finite State Machines, Edit Distance Week 2: Finite State Transducers, Text Normalization, Week 3: Language models, tf-idf, bag of words, n-grams Week 4: Lexical, syntactic and morphological analysis Week 5: Semantic analysis Week 6: Text classification, text summarization Week 7: Machine translation, Q&A Systems, Chatbots Week 8: Speech Analysis Week 9: Neural Nets, Embeddings Week 10: Deep Learning and Language Models Week 11: Projects
References	1- Speech and Language Processing, D. Jurafsky& J.H. Martin, https://web.stanford.edu/~jurafsky/slp3/ 3rd edition draft 2- Foundation of Statistical Natural Language Processing, C.D. Manning & H. Schütze, MIT Press, 2003 3- Natural Language Processing with Python, Steven Bird, Ewan Klein, and Edward Loper O'Reilly, 2009: http://www.nltk.org/book/ Supplementary Books: 4- Python 3 Text Processing with NLTK 3 Cookbook, Jacob Perkins, Packt Publishing, 2014 5- Applied Text Analysis with Python, Benjamin Bengfort, Tony Ojeda, Rebecca Bilbro, O'Reilly, 2018 6- Turkish Natural Language Processing, Kemal Oflazer, Murat Saraçlar, Springer, 2018 7- Neural Network Methods for Natural Language Processing, Yoav Goldberg, Morgan & Claypool, 2017

Theory Topics

Week	Weekly Contents