



ECTS COURSE INFORMATION FORM

Faculty	Faculty of Engineering		
Program	B.Sc. in Computer Engineering	Elective	
	B.Sc. in Electrical-Electronics Engineering	Elective	
	B.Sc. in Industrial Engineering	Elective	
	B.Sc. in Civil Engineering	Elective	
	B.Sc. in Mechanical Engineering	Elective	

Course Code	COMP 451			
Course Title in English	Introduction to Natural Language Processing			
Course Title in Turkish	Doğal Dil İşlemeye Giriş			
Language of Instruction	English			
Type of Course	Flipped Classroom			
Level of Course	Undergraduate			
Course Category (by % of Content)	Basic Science 20	Basic Engineering 30	Engineering Design 50	General Education 0
Semester Offered	Fall			
Contact Hours per Week	Lecture: 3 hours	Recitation: -	Lab:-	Other:-
Estimated Student Workload	152 hours per semester			
Number of Credits	6 ECTS			
Grading Mode	Standard Letter Grade			
Pre-requisites	None			
Expected Prior Knowledge	Prior knowledge in programming, basic mathematics and probability.			
Co-requisites	None			
Registration Restrictions	Only Undergraduate Students			
Overall Educational Objective	To gain an understanding of computational properties of natural languages, learn different aspects and basic fundamentals of natural language processing, and become familiar with how to design algorithms and applications to process linguistic information.			
Course Description	This course covers the fundamentals of natural language processing: morphological analysis, syntactic analysis, parsing, language models, semantics, pragmatic analysis, and evaluation. Moreover, some NLP topics and algorithms are covered such as part-of-speech tagging, word sense disambiguation, dialogue systems, language generation, text classification, summarization, and question answering.			
Course Description in Turkish	Bu ders doğal dil işlemede kullanılan temel yöntemleri içermektedir: biçimbilimsel çözümleme, sözdizimsel analiz, bağıllık ayrıştırma, dil modelleri, anlambilim, pragmatik analiz ve performans değerlendirme. Ek olarak, kelime türü etiketleme, kelime anlamı belirleme, diyalog sistemleri, dil üretimi, metin sınıflandırma, özet çıkarımı ve soru cevaplama gibi bazı doğal dil işleme konuları ve algoritmaları ele alınmaktadır.			
Course Learning Outcomes and Competences	Upon successful completion of the course, the learner is expected to: 1. comprehend basic principles, algorithms and theoretical issues underlying natural language processing; 2. use probability and statistics to solve linguistic problems; 3. apply computational techniques and tools to process texts written in human languages;			

4. analyze and interpret textual data used for natural language processing applications;
5. demonstrate team effort in identifying and solving a complex engineering problem using NLP techniques;
6. acquire and apply new knowledge to prepare a well-organized research report on a selected topic;
7. present research work in front of an audience.

Relationship of the Course with the Student Outcomes	Level	Learning Outcome(s)	Assessed by
Student Outcomes	N=None S=Supportive H=High		Exam, Project, Assignments, Research Report and Presentation
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	H	1,2	Exam, Assignments, Project
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	S	3	Assignments, Project
(3) an ability to communicate effectively with a range of audiences	S	7	Research Presentation
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts			
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	H	5	Project
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	S	4	Project, HW
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	S	6	Research Report
Prepared by and Date	Asst. Prof. Dr. Şeniz Demir / August 2020		
Semester	Fall 2020-2021		
Name of Instructor	Asst. Prof. Dr. Şeniz Demir		
Course Contents	Week	Topic	
	1.	Introduction to Natural Language Processing	
	2.	Morphological Analysis and Disambiguation	
	3.	Language Models and N-grams	
	4.	Syntactic Analysis and Dependency Parsing	
	5.	Semantics, Discourse, and Pragmatics	
	6.	Evaluation Methods and Metrics	
	7.	Part-of-speech Tagging and Word Sense Disambiguation	
	8.	Text Classification and Named Entity Recognition	
	9.	Text Summarization	
	10.	Dialogue Systems	
	11.	Natural Language Generation	
	12.	Word Embeddings	
	13.	Sequence-to-sequence learning with RNNs	
	14.	Research report presentations	
	15.	Final Examination/Project/Presentation Period	
	16.	Final Examination/Project/Presentation Period	

Required/Recommended Readings	<ul style="list-style-type: none"> (Recommended) Speech and Language Processing, D. Jurafsky, J.H. Martin, 2nd Edition, Pearson-Prentice Hall, 2009. (Supplementary) Foundations of Statistical Natural Language Processing, C.D. Manning, H. Schutze, MIT Press, 2002. (Supplementary) Natural Language Processing with Python, S.Bird, E.Klein, E.Loper, O'Reilly Media, 2009.
Teaching Methods	Flipped Classroom
Homework and Projects	Assignments and Project
Laboratory Work	-
Computer Use	Required
Other Activities	-
Assessment Methods	Assignments (15%), Midterm Exam (30%), Research Report and Presentation (20%), Project (35%)
Course Administration	<p>Instructor's office: Room 536 (5th floor) Office hours: TBA. E-mail address: demirse@mef.edu.tr Rules for attendance: No attendance required A reminder of proper classroom behavior, code of student conduct: YÖK Regulations Statement on plagiarism: YÖK Regulations</p>

ECTS Student Workload Estimation	Activity	No/Weeks	Hours			Calculation	Explanation
		No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
	Lecture/Flipped Classroom	14	1	3	1	70	A*(B+C+D)
	Quizzes					0	
	Midterm(s)	1	10	2	2	14	A*(B+C+D)
	Assingment, Project, Research Report and Presentation	4	1	14	2	68	A*(B+C+D)
	Final Examination						A*(B+C+D)
	Total Workload					152	
	Total Workload/25					6.08	
	ECTS					6	