

COURSE DESCRIPTION FORM

Course Code and Name	CENG456 INTRODUCTION TO NATURAL LANGUAGE PROCESSING (TECH. ELECT.)
Course Semester	8
Catalog Content	The fundamentals of Natural Language Processing, linguistic essentials, grammar and languages, regular expressions, morphological and syntactic analysis, language models, machine learning, word semantic and embedding, neural networks, document classification and sentiment analysis, information retrieval and extraction, named entity recognition, machine translation and question answering.
Textbook	Daniel Jurafsky, and James H. Martin, "Speech and Language Processing", Third Edition, Prentice Hall, 2018.
Supplementary Textbooks	Christopher D. Manning, and Hinrich Schutze, "Foundations of Statistical Natural Language Processing", The MIT Press, 1999. Bird, Steven, Edward Loper and Ewan Klein, "Natural Language Processing with Python", O'Reilly Media Inc., 2009.
Credit	6
Prerequisites of the Course (Attendance Requirements)	-
Type of the Course	Technical Elective
Instruction Language	English
Course Objectives	To provide the students with the theoretical background in the field of Natural Language Processing and to provide experience on Natural Language Processing applications.
Course Learning Outcomes	1.Understanding the principles of Natural Language Processing. 2.Having knowledge about grammar and languages. 3.Using Natural Language Processing analysis approaches. 4.Defining language models. 5.Having knowledge about word meanings and representation. 6.Using document classification algorithms. 7.Developing natural language processing applications such as tagging text fragments, entity name recognition.
Instruction Methods	The mode of delivery of this course is face to face.
Weekly Schedule	1.Week: Fundamentals of Natural Language Processing 2.Week: Linguistic essentials, grammar, and languages 3.Week: Regular expressions 4.Week: Morphological analysis 5.Week: Syntactic analysis 6.Week: Language models 7.Week: Machine Learning 8.Week: Word semantic and embedding 9.Week: Neural Networks 10.Week: Document classification and sentiment analysis 11.Week: Information retrieval and extraction 12.Week: Named entity recognition 13.Week: Machine translation 14.Week: Question answering
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours Internet search and library work Designing and implementing materials Preparing a report Preparing a presentation and presentation Midterm and revision for midterm Final exam and revision for final exam

Assessment Criteria		Number(s)	Weight (%)						
	Midterm exam	1	30						
	Assignment								
	Application								
	Project	1	30						
	Practice								
	Quiz								
	Final exam	1	40						
Total	3	100							
Workload	Activity		Number of Weeks	Duration (Weekly Hour)	End of Semester Total Workload				
	Weekly theoretical course hours		14	3	42				
	Weekly practical course hours		0	0	0				
	Reading activities		0	0	0				
	Internet search and library work		10	5	50				
	Designing and implementing materials		5	5	25				
	Making a report		1	8	8				
	Preparing and making presentations		1	5	5				
	Midterm and revision for midterm		1	10	10				
	Final exam and revision for final exam		1	10	10				
	Total workload				150				
	Total workload/ 25				6				
	Course Credit (ECTS)				6				
Contribution Level Between Course Learning Outcomes and Program Outcomes	No	Program Outcomes			1	2	3	4	5
	1	Knowledge of mathematics, science, basic engineering, computing, and computer engineering; ability to use this knowledge in solving complex engineering problems.					x		
	2	Ability to define, formulate and analyze complex engineering problems using basic science, mathematics and engineering knowledge and considering the UN Sustainable Development Goals relevant to the problems addressed.						x	
	3	Ability to design creative solutions to complex engineering problems; ability to design complex systems, processes, devices, software, algorithms or products to meet current and future requirements, considering realistic constraints and conditions.						x	
	4	Ability to select, use and develop appropriate techniques, resources and modern engineering and informatics tools, including estimation and modeling, for the analysis and solution of complex engineering problems while being aware of their limitations.						x	
	5	Ability to use research methods to examine complex engineering problems or research topics in computer engineering, including reviewing the literature, designing experiments, conducting experiments, collecting data, analyzing and interpreting						x	

		results.					
	6	Knowledge of the effects of engineering practices and the standards used in these practices on society, health and safety, economy, sustainability and environment within the scope of the UN Sustainable Development Goals; awareness of the consequences of engineering solutions in the fields of information security and law.					
	7	Acting in accordance with engineering professional principles and knowledge on ethical responsibility; awareness of acting impartially, without discrimination on any issue, and being inclusive of diversity.					
	8	Ability to work effectively individually and as a team member or leader in intradisciplinary and multidisciplinary teams (face-to-face, remote, or hybrid).					x
	9	Ability to conduct effective verbal and written communication on technical issues in Turkish or English, prepare reports, make effective presentations and prepare software documentation, considering the various differences of the target audience (such as education, language, profession).					x
	10	Knowledge of business practices such as project, risk and change management and economic feasibility analysis; awareness of entrepreneurship and innovation.			x		
	11	Lifelong learning skill that includes the ability to learn independently and continuously, to adapt to new and developing scientific practices and technologies, and to think inquisitively about technological changes.				x	
The Course's Lecturer(s) and Contact Information		Assist. Prof. Dr. Ceren Güzel Turhan cerenguzel@gazi.edu.tr					