DEPARTMENT OF INFORMATICS & TELECOMMUNICATIONS

INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS					
SCHOOL	SCHOOL OF SCIENCE					
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS					
COURSE LEVEL	UNDERGRADUATE					
COURSE TITLE	**Artificial Intelligence II**					
COURSE CODE	**YS19**	Semester	**6**	ECTS	6	
TEACHING HOURS per week	THEORY	3	TUTORIAL	1	LABORATORY	

COURSE TYPE	Optional Course (ΠΜ)						
	K	S1	S2	S3	S4	S5	S6
			B				

URL	https://eclass.uoa.gr/courses/DI517/ https://cgi.di.uoa.gr/~ys19
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	YS02 Artificial Intelligence
TEACHING AND EXAMINATIONS LANGUAGE:	ENGLISH (the course can also be taken by graduate students of the Data Science and Information Technologies master's program where the language of instruction is English).
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES

COURSE CONTENT

The course concentrates on the study of deep learning techniques and their use in natural language processing.

Topics: introduction to machine learning, regression, perceptron, neural networks, backpropagation, deep neural network training, word vectors, word2vec and related models, language modeling and RNNs, vanishing gradients, LSTMs/GRUs, machine translation, seq2seq and attention, transformers, large language models (BERT, GPT family, GEMINI family etc.).

The programming exercises of the course are done using Python, SciKitLearn and PyTorch.

STUDENT LEARNING OBJECTIVES
Teaching-Learning Goals-Expected Learning Outcomes. Upon successful completion of the course the student will be able to: • Solve problems requiring text processing or natural language processing using neural networks. • Use machine learning models in other areas (e.g., Computer Vision). • Develop machine learning systems using Python, SciKitLearn and PyTorch.

TEACHING AND LEARNING METHODS – ASSESSMENT	
TEACHING METHOD	In Class (Face to Face)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process supported by the e-class platform and piazza. Email communication Live transmission of lectures Ability to track recorded lectures Utilization of programming language Python and ML frameworks SciKitLearn and PyTorch.
TEACHING ORGANIZATION *Describe in detail the way and methods of teaching:* *Enhanced Lectures,* *Online Lectures,* *Seminars,* *Tutorial,* *Laboratory,* *Laboratory Exercise,* *Study & analysis of literature,* *Practice (Positioning),* *Interactive teaching,* *Developing a project,* *Individual / group work* *Telework (reference to tools) etc.* *Details of the student's study hours for each learning activity and hours of non-guided study are shown to ensure that the total workload at the semester corresponds to the ECTS*	<table><tr><th>Activity</th><th>*Student Workload* *(hours)*</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Tutorials</td><td>13</td></tr><tr><td>Homework</td><td>98</td></tr><tr><td>Final Exam</td><td>0</td></tr><tr><td>*Total Course*</td><td>*150*</td></tr></table>

COURSE SYLLABUS

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Εθνικόν και Καποδιστριακόν
Πανεπιστήμιον Αθηνών
ΙΔΡΥΘΕΝ ΤΟ 1837

dit   DEPARTMENT OF
INFORMATICS &
TELECOMMUNICATIONS

ASSESSMENT OF STUDENTS
Description of the assessment process

ASSESSMENT OF STUDENTS

Description of the assessment process

Assessment Methods, Formative or Concluding, Multiple Choice Test, Quick Response Questions, Test Development Questions, Problem Solving, Written Work, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Other / Other

Fully defined evaluation criteria are mentioned and if and where they are accessible to students.

Assessment methods	Number	Percentage
Homeworks	4	4*25=100%

4 individual exercises with theoretical and programming questions.

LITERATURE AND STUDY MATERIALS / READING LIST
• Detailed slides presented in class and made available on the course Web page.   • Other material on the course Web page.