INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS					
SCHOOL	SCHOOL OF SCIENCE					
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS					
COURSE LEVEL	UNDERGRADUATE					
COURSE TITLE	**Deep Learning for Natural Language Processing**					
COURSE CODE	**K09**		**Semester**	**1**	**ECTS**	**7**
TEACHING HOURS per week	**THEORY**	**4**	**SEMINAR.**	**2**	**LABORATORY**	
COURSE TYPE	**Select one of the following and delete the rest** Optional Course (ΠΜ)					
URL	https://eclass.uoa.gr/courses/DI517/					
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	--					
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK					
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, word vectors, word2vec and related models, dependency parsing, language modeling and RNNs, vanishing gradients and fancy RNNs, machine translation, seq2seq and attention, question answering, convolutional networks for NLP, contextual word embeddings, transformers, BERT, GPT-3 and related models, natural language generation, question answering for knowledge graphs, coreference resolution, dialogue systems and chatbots.

The programming exercises of the course are done using Python/TensorFlow/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 neural networks in other areas (e.g., Computer Vision).

- Develop machine learning systems using Python/TensorFlow/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, specifically lecture material, discussions, announcements etc. Email communication. Live transmission of lectures with presentation. Ability to track recorded lectures. Utilization of educational environments (https://eclass.uoa.gr/courses/DI517/).
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*	

Activity	***Student Workload*** *(hours)*
Lectures	39
Tutorials	13
Preparation for next week's lecture	13
Homeworks	85
Final Exam	0
Total Course	***150***

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	5	100%

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.