

## Democritus University of Thrace, Kavala, Greece

School of Science Department of Informatics

Department of European and International Programmes – Erasmus+ Agios Loukas, 654 04, Kavala University Campus, Greece 0030-2510-462221 & -290 & -308

## Proposed Course for incoming Erasmus students<sup>1</sup>

COUTSE       Introduction to Machine Learning         Regression       Neural Networks         Probability Distributions       Convolutional Neural Networks         Graphical Models       Autoencoders         Restricted Boltzmann Machines       Transformers         Adversarial Networks       Diffusion Models         Diffusion Models          Aim of the course and target audience       • The course will introduce students to Deep Learning         • Target audience       • Target audience: Undergraduate students of Informatics/         Computer Science OR Education       Lectures: 26 hours         Hands-on exercises: 26 hours       Evaluation:	Responsible for the course (lecturer) (name, phone number, e- mail address) Title of the Course ECTS credits	Professor Stergios Papadimitriou 0030 2510 462 323 sterg@cs.duth.gr Distributed Systems and Big Data 5		
Aim of the course and target audience <ul> <li>The course will introduce students to Deep Learning</li> <li>Target audience</li> <li>Teaching Methods duration and Evaluation</li> <li>Lectures: 26 hours</li> <li>Evaluation:</li> </ul> Final Action <ul> <li>Lectures: 26 hours</li> <li>Evaluation:</li> </ul> Final Action: <ul> <li>Lectures: 26 hours</li> <li>Evaluation:</li> <li>Evaluation:</li> </ul>	Short contents of the			
Neural Networks         Probability Distributions         Convolutional Neural Networks         Graphical Models         Autoencoders         Restricted Boltzmann Machines         Transformers         Adversarial Networks         Diffusion Models         Aim of the course and target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation         Lectures: 26 hours         Hands-on exercises: 26 hours         Evaluation:	course	Introduction to Machine Learning		
Probability Distributions         Convolutional Neural Networks         Graphical Models         Autoencoders         Restricted Boltzmann Machines         Transformers         Adversarial Networks         Diffusion Models         Aim of the course and target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation         Lectures: 26 hours         Hands-on exercises: 26 hours         Evaluation:		e		
Convolutional Neural Networks         Graphical Models         Autoencoders         Restricted Boltzmann Machines         Transformers         Adversarial Networks         Diffusion Models         Aim of the course and target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation         Lectures: 26 hours         Hands-on exercises: 26 hours         Evaluation:		Neural Networks		
Graphical Models         Autoencoders         Restricted Boltzmann Machines         Transformers         Adversarial Networks         Diffusion Models         Aim of the course and         target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/         Computer Science OR Education         Teaching Methods duration and Evaluation         Lectures: 26 hours         Hands-on exercises: 26 hours         Evaluation:		Probability Distributions		
Autoencoders         Restricted Boltzmann Machines         Transformers         Adversarial Networks         Diffusion Models         Aim of the course and         target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/         Computer Science OR Education         Teaching Methods duration         Actuation         Lectures: 26 hours         Hands-on exercises: 26 hours         Evaluation:		Convolutional Neural Networks		
Restricted Boltzmann Machines         Transformers         Adversarial Networks         Diffusion Models         Aim of the course and         target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation       Lectures: 26 hours Hands-on exercises: 26 hours         Evaluation:		Graphical Models		
Transformers         Adversarial Networks         Diffusion Models         Aim of the course and         target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation       Lectures: 26 hours Hands-on exercises: 26 hours         Evaluation:		Autoencoders		
Adversarial Networks         Diffusion Models         Aim of the course and target audience         • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation       Lectures: 26 hours         Evaluation:		Restricted Boltzmann Machines		
Aim of the course and target audience       • The course will introduce students to Deep Learning         • Target audience       • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation       Lectures: 26 hours Hands-on exercises: 26 hours         Evaluation:       Evaluation:		Transformers		
Aim of the course and target audience       • The course will introduce students to Deep Learning         • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation       Lectures: 26 hours         Evaluation       Evaluation:		Adversarial Networks		
target audience       • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation       Lectures: 26 hours Hands-on exercises: 26 hours         Evaluation:       Evaluation:		Diffusion Models		
target audience       • Target audience: Undergraduate students of Informatics/ Computer Science OR Education         Teaching Methods duration and Evaluation       Lectures: 26 hours Hands-on exercises: 26 hours         Evaluation:       Evaluation:				
Teaching Methods duration and Evaluation       Lectures: 26 hours Hands-on exercises: 26 hours         Evaluation:       Evaluation:				
Teaching Methods duration and Evaluation       Lectures: 26 hours Hands-on exercises: 26 hours         Evaluation:       Evaluation:	target audience			
and Evaluation Hands-on exercises: 26 hours Evaluation:		Computer Science OR Education		
Evaluation:	•			
	and Evaluation	Hands-on exercises: 26 hours		
		Evoluction		
I 100% Individual ANU/OR Group Assignments		Evaluation: 100% Individual AND/OR Group Assignments		
Offered Period Fall semester	Offered Period			

Indicative bibliography	1.	Christopher M. Bishop, with Hugh Bishop, <i>Deep Learning</i> , Springer 2024
	2.	Ian Goodfellow, Yoshua Bengio, and Aaron Courville, <i>Deep Learning</i> , MIT Press, 2916
	3.	Sergios Theodoridis, Machine Learning: A Bayesian and
		Optimization Perspective, Second Edition, Academic Press 2020
	4.	Bharath Ramsundar, Peter Eastman, Patrick Walters, Vijay,
		Deep Learning for the Life Sciences, O'Reily, 2019
	5.	Charu C. Aggarwal, Neural Networks and Deep Learning, Second Edition,
		Springer 2023

<sup>1</sup> Could be easily used and offered for TS movement to our Erasmus partners