

Intelligent Systems and Data Mining in Animal Science [239]

COURSE OUTLINE

(1) GENERAL

SCHOOL	ANIMAL BIOSCIENCES		
ACADEMIC UNIT	DEPARTMENT OF ANIMAL SCIENCE		
LEVEL OF STUDIES	Undergraduate [Free Elective]		
COURSE CODE	239	SEMESTER	9 th
COURSE TITLE	INTELLIGENT SYSTEMS AND DATA MINING IN ANIMAL SCIENCE		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS (ECTS)
Theory: Lectures		1	1
Laboratory: Use of Software Tools		1	1
Total		2	2
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	General knowledge, Scientific Area, Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS:	Yes (in Greek)		
COURSE WEBSITE (URL):	http://openeclass.aua.gr		

(2) LEARNING OUTCOMES

Learning outcomes	
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A - Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area - Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B - Guidelines for writing Learning Outcomes	
Upon successful completion of this course, the student will - be aware of the possibilities and the individual branches of Artificial Intelligence that can be implemented in areas of Animal Science and Aquaculture, - understand the meaning and characteristics of an intelligent system, - understand the concept of an intelligent training system, - justify whether it is possible to develop a system based on Artificial Intelligence, - be able to distinguish and choose the most appropriate method for knowledge extraction through a large number of data, - acquire the necessary skills to exploit ready-made tools for data mining, to develop an intelligent system, - be able to organize his/her data in simple files or in Database to be ready for data mining processing, - combining results reached from data mining they will be able to reach new knowledge.	
General Competences	
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?	
Search for, analysis and synthesis of data and information, with the use of the necessary technology Adapting to new situations Decision-making Working independently Team work Working in an international environment	Project planning and management Respect for difference and multiculturalism Respect for the natural environment Showing social, professional and ethical responsibility and sensitivity to gender issues Criticism and self-criticism Production of free, creative and inductive thinking

Working in an interdisciplinary environment Production of new research ideas	 Others...
• Data retrieval, analysis and synthesis of data and information using new information technologies. • Adapting to new situations. • Decision making. • Individual work. • Teamwork. • Work in a multidisciplinary environment. • Production of new research ideas. • Design and project management. • Promotion of the free, creative and inductive way of thinking.	

(3) SYLLABUS

Theory 1. Introduction to Artificial Intelligence. 2. Introduction to Artificial Neural Networks (Model neuron, Principles, training, Evaluation, Categories of Artificial Neural Networks Use of tools for the development of Artificial Neural Networks) 3. Introduction to Methods and techniques of data mining.	
Laboratory 1. Exploitation and use of tools for data mining purpose (WEKA). 2. Exploitation and use Artificial Neural Networks development tools. 3. Development of Educational Applications of Intelligent Systems with emphasis in Biology and Animal Science and Aquaculture.	

(4) TEACHING and LEARNING METHODS - EVALUATION

TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i>	In classroom and in laboratory (face-to-face)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Exploitation of Information and Communication Technologies in teaching, in laboratory training and in the communication with students. Use of dedicated software. Use of integrated e-learning system. Communication with students via open eclass platform and e-mail.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	13
	Laboratory work	13
	Individual study	24
	Course total (25 h of workload per ECTS)	50
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	I. Theory Final Exam, written or oral, of increasing difficulty, which may include Multiple choice test, Questions of brief answer, Questions to develop a topic, Judgment questions and Exercise solving. Assuming feasibility, Progress exams will take place during the semester whose marking will contribute to the determination of the final Theory mark. Marking Scale: 0-10. Minimum Passing Mark: 5. II. Laboratory Final Exam, hands on computer, of the software tools taught. Assuming feasibility, • the performance of the trainees at the exercises assigned to them during the semester will be evaluated, • Progress exams will take place during the semester, and the mark of the above will contribute to the determination of the final Laboratory mark. Marking Scale: 0-10.	

	Minimum Passing Mark: 5. The final Course mark is the average of the marks on Theory and Lab. If needed, the evaluation can be performed electronically through the eClass platform. The evaluation criteria are known in advance and uploaded into the electronic page of the course in eClass. The students are able to access their examination deliverables.
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(5) ATTACHED BIBLIOGRAPHY

-Προτεινόμενη Βιβλιογραφία :

1. Tan Pang - Ning, Steinbach Michael, Kumar Vipin, Βερύκιος Βασίλειος (επιμέλεια), Εισαγωγή στην εξόρυξη δεδομένων, 2η Έκδοση, ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε., 2018, Αθήνα.
2. Anand Rajaraman, Jeffrey David Ullman, Jure Leskovec, Εξόρυξη από Μεγάλα Σύνολα Δεδομένων - 3η Έκδοση, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ ΙΔΙΩΤΙΚΗ ΚΕΦΑΛΑΙΟΥΧΙΚΗ ΕΤΑΙΡΕΙΑ, 2020, Αθήνα.
3. Νικόλαος Ματσατσίνης, Επιχειρηματική Ευφυΐα, Αναλυτική και Ανάλυση Μεγάλων Δεδομένων για Λήψη Αποφάσεων, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ ΙΔΙΩΤΙΚΗ ΚΕΦΑΛΑΙΟΥΧΙΚΗ ΕΤΑΙΡΕΙΑ, 2020, Αθήνα.
4. Κύρκος Ευστάθιος. Επιχειρηματική Ευφυΐα και Εξόρυξη Δεδομένων (Κωδικός Βιβλίου στον Εύδοξο: 320088) Έκδοση: 1/2016 ISBN: 978-960-603-109-0. Ηλεκτρονικό Βιβλίο. Διαθέτης (Εκδότης): Ελληνικά Ακαδημαϊκά Ηλεκτρονικά Συγγράμματα και Βοηθήματα - Αποθετήριο "Κάλλιπος".
5. Σταλίδης Γιώργος, Καρδάρας Δημήτρης. Διαχείριση δεδομένων και επιχειρηματική ευφυΐα. (Κωδικός Βιβλίου στον Εύδοξο: 320080). Έκδοση: 1/2016. ISBN: 978-960-603-398- 8. Ηλεκτρονικό Βιβλίο Διαθέτης (Εκδότης): Ελληνικά Ακαδημαϊκά Ηλεκτρονικά Συγγράμματα και Βοηθήματα - Αποθετήριο "Κάλλιπος".

-Συναφή επιστημονικά περιοδικά:

1. DATAMINE - Data Mining and Knowledge Discovery
2. IDA - Intelligent Data Analysis
3. IJDM - International Journal of Data Warehousing and Mining
4. MLDM - Transactions on Machine Learning and Data Mining