COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING		
ACADEMIC UNIT	INFORMATICS AND COMPUTER ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE		**SEMESTER**	**5**
COURSE TITLE	**ARTIFICIAL INTELLIGENCE**		

INDEPENDENT TEACHING ACTIVITIES 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	**WEEKLY TEACHING HOURS**	**CREDITS**
LECTURES	2	
TUTORIALS	1	
LAB PROJECTS	1	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	4	5

COURSE TYPE general background, special background, specialised general knowledge, skills development	Science area, Skills Development
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (project-based)
COURSE WEBSITE (URL)	http://eclass.uniwa.gr

(2) LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- Gain a historical perspective of AI and its foundations.
- Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.
- Become familiar with blind and heuristic search algorithms.
- Understand various knowledge-representation forms.
- Become familiar with the structure and operation of expert systems and rule-based systems.
- Describe various machine learning systems, as decision trees, neural networks and genetic algorithms.
- Investigate applications of AI techniques in intelligent agents, expert systems, etc.
- Explore the current scope, potential, limitations, and implications of intelligent systems.

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	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

- Working independently
- Production of free, creative and inductive thinking
- Decision making
- Criticism and self-criticism
- Adapting to new situations

(3) SYLLABUS

- Introduction to Artificial Intelligence, historic overview
- Blind search algorithms
- Heuristic search algorithms
- Inference methods
- Expert Systems
- Propositional Logic
- First-order Logic
- Reasoning
- Knowledge-based systems, expert systems
- Autonomous agents
- Production Trees
- Genetic Algorithms
- Applications

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	Face-to-face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	• Use of the university's online teaching platform for posting theory, exercises and various resources. • Use of e-mail and the online teaching platform for communication with the students.
TEACHING METHODS 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. 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	**Activity** / **Semester workload** Lectures: 26 Tutorials: 26 Projects: 21 Individual study: 52 Course total: **125**
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure 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 Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Language of evaluation: Greek The final marks will be extracted as the weighted sum of a final written exam (60%), a midterm lab exam (12%), lab individual project (24%) and lab team activities (4%).

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Βλαχάβας, Ι., Κεφαλάς, Π., Βασιλειάδης, Ν., Ρεφανίδης, Ι., Κοκκοράς, Φ. & Σακελλαρίου, Η., Τεχνητή Νοημοσύνη, 4η έκδοση, Εταιρεία Αξιοποίησης και Διαχείρισης Περιουσίας του Πανεπιστημίου Μακεδονίας, 2020.
2. Γεωργούλη, Κ., ΤΕΧΝΗΤΗ ΝΟΗΝΟΣΥΝΗ, ηλεκτρονικό σύγγραμμα. 2015, Ελληνικά Ακαδημαϊκά Ηλεκτρονικά Συγγράμματα και Βοηθήματα - Αποθετήριο "Κάλλιπος".
3. Russell, Stuart J., Norvig, Peter, Τεχνητή Νοημοσύνη: μια σύγχρονη προσέγγιση, Κλειδάριθμος, 2021.
4. P. Winston, Artificial Intelligence, Addison-Wesley, 1992.
5. T.J. Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1995.
6. S. Haykin, "Neural Networks: A Comprehensive Foundation", MacMillan, 1994.
7. D. Goldberg, "Genetic Algorithms in Search,Optimization and Machine Learning", Addison-Wesley, 1989.
8. "Building Expert Systems", F. Hayes-Roth, D.A. Waterman and D.B. Lenat (Eds.), Addison-

Wesley, 1983.
9. Bigus, Joseph P., Bigus, Jennifer Constructing intelligent agents with Java :a programmer's guide to smarter applications, New York : Wiley, 1998.
10. Bellifemine, Fabio Luigi, Caire, Giovanni, Greenwood, Dominic, Developing multi-agent systems with jade, Hoboken, NJ : John Wiley, 2007.