COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering, University of Patras		
ACADEMIC UNIT	Department of Computer Engineering and Informatics		
LEVEL OF STUDIES	Undergraduate Obligatory		
COURSE CODE	CEID_NY451	SEMESTER	WINTER (5o)
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,Tutorials,Lab Sessions (Project)	3X2X1	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	6	6

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialised general knowledge and skills development
PREREQUISITE COURSES:	There are no prerequisite courses. Recommended background knowledge: basic knowledge in Maths (CEID_NY101, CEID_NY102, CEID_NY109) Algorithms (CEID_NY205) and Programming (CEID_NY131, CEID_NY134).
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Instruction may be given in English if foreign students attend the course.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	https://eclass.upatras.gr/courses/CEID1104/

(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*

Learning outcomes:
At the end of this course the student will be able to:

- Explain the function of search algorithms
- Model and solve problems with search methods
- Represent knowledge through first-order logic
- draw conclusions from logical propositions using the resolution refutation approach
- solve problems using logical programming through the Prolog language
- Represent knowledge with rules and frames and make inferences
- Represent vague and uncertain knowledge and make inferences
- Model problems as constraint satisfaction problems and solve them
- Model problems as problems of planning and solve them
- Report and explain intelligent agent architectures

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* *Working in an interdisciplinary environment* *Production of new research ideas*	*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* *……* *Others…* *…….*
Search for, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Working independently Team work Production of free, creative and inductive thinking Production of new research ideas	

(3) SYLLABUS

- Introduction to Artificial Intelligence
- Introduction to problem solving theory
- Search space, problem modeling, constraints, problem solving
- Basic concepts (representation, goal, evaluation function, definition of search problem, neighboring areas and local optimal points, hill climbing methods)
- Traditional Methods - Part I (exhaustive search, local search)
- Traditional Methods - Part II (depth-first and breadth-first search, greedy algorithms, algorithm A *, general search algorithm, dynamic programming)
- Solving Constraint Satisfaction Problems
- Knowledge Representation (Definition, Key Elements, Evaluation Criteria, Procedural and Declarative View)
- First-order predicate logic, Basic concepts of model theory and proof theory, Clausal form, Resolution Principle, Resolution Refutation, Resolution Strategies
- Logical Programming, Prolog Language
- Rules and Production Systems
- Representation of uncertain knowledge (Bayes rules, certainty factors)
- Semantic networks, Frames
- Planning
- Intelligent agents

(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*	Information and Communications Technologies are used in communicating with students. We use: eclass, email and forum.
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-*	

Activity	*Semester workload*
Lectures	90
Tutorials	60
Lab Sessions (Projects)	30
Course total	**180**

directed study according to the principles of the ECTS	
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.*	• Written examination (84% of the total grade) • Laboratory Exercises or Project (16% of the total grade).

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Βλαχάβας Ιωάννης, Κεφάλας Πέτρος, Βασιλειάδης Νικόλαος, Κόκκορας Φώτης, Σακελλαρίου Ηλίας. Τεχνητή Νοημοσύνη. Εκδόσεις Παν/μιου Μακεδονίας, Διαθέτης: Εταιρεία Αξιοποίησης και Διαχείρισης Περιουσίας του Πανεπιστημίου Μακεδονίας, Θεσσαλονίκη, 2011.
- Stuart Russell, Peter Norving. Artificial Intelligence, A Modern Approach, 2nd edition. Prentice Hall, 2002.
- Z. Michalewicz, D. Fogel. How to Solve It: Modern Heuristics. 2nd edition, Springer, 2004.