

<b>SCHOOL</b>	School of Sciences		
<b>ACADEMIC UNIT</b>	Department of Computer Science		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	405SBOB	<b>SEMESTER</b>	4
<b>COURSE TITLE</b>	ARTIFICIAL INTELLIGENCE		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <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>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
Lectures	2	5	
Tutorial Exercises	1		
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	General Background, Skills Development		
<b>PREREQUISITE COURSES:</b>	Algorithms and Data Structures (201SBOB)		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek, English		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>			

## LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li><i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li><i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li><i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>The purpose of the course is to introduce the scientific area of Artificial Intelligence by presenting its historical development, studying mature technologies, and describing contemporary trends in a wide range of practical applications. Specifically,</p> <p>The course material aims to introduce students to basic search techniques, description, and their combination. Emphasis is placed on the identification of practical problems where search techniques can be applied such as two-opponent games, constraint satisfaction problems, etc.</p> <p>Also, the aim is the description of knowledge representations, various reasoning, as well as the description and distinction of various technologies/techniques for handling uncertain knowledge.</p> <p>Finally, the aim of the course is the recognition by the students of modern application fields of artificial intelligence methods with an emphasis on the internet.</p> <p>In this sense, the course is the basis on which specific methodologies and techniques are developed in separate special courses of the direction.</p> <p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• It can describe a search problem (a) in state space and (b) by induction.</li> <li>• It can select an appropriate search algorithm to apply to a particular AI problem.</li> </ul>

- It can describe a variety of knowledge representations.
- Can recognize various lines of reasoning.
- Can distinguish different types of uncertain knowledge and do some basic calculations with each type of uncertain knowledge.
- It can choose a combination of suitable artificial intelligence methodologies for application in modern fields such as the internet.

**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?*

- |   |   |
|---|---|
| <i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> | <i>Project planning and management</i>  |
| <i>Adapting to new situations</i>   | <i>Respect for difference and multiculturalism</i>  |
| <i>Decision-making</i>  | <i>Respect for the natural environment</i>  |
| <i>Working independently</i>  | <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> |
| <i>Team work</i>  | <i>Criticism and self-criticism</i>   |
| <i>Working in an international environment</i>  | <i>Production of free, creative and inductive thinking</i>                                      |
| <i>Working in an interdisciplinary environment</i>  | <i>.....</i>  |
| <i>Production of new research ideas</i>   | <i>Others...</i>  |
|   | <i>.....</i>  |

- Search, analysis and synthesis of data and information, using the necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous Work
- Teamwork
- Generation of new research ideas
- Production of free, creative and inductive thinking

**SYLLABUS**

1. Introduction to the subject. Correlation with other scientific areas. List of essential tools
2. Description (a) in state space and (b) by induction, and examples
3. Study of search algorithms, e.g. depth, breadth, "blind" search, "heuristic" search, etc
4. Applications of search algorithms to two-opponent games
5. Consistency checking algorithms
6. Knowledge representations, reasoning and handling of uncertain knowledge
7. Probability theory with emphasis on Bayes' theorem and the Dempster-Shafer approach
8. Fuzzy sets, fuzzy logic and their applications
9. Agents and semantic web

**TEACHING and LEARNING METHODS - EVALUATION**

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	In class	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Electronic communication (e-mail) according to the needs.	
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i> <i>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,</i>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	39
	Exercises that focus on applications	26
	Bibliography study (group)	20
	Individual Exercises	20

<i>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>	Project	20
	Course total	125
<b>STUDENT PERFORMANCE EVALUATION</b> <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. Final written exam (100%) including problem solving  The evaluation criteria are as follows: <ul style="list-style-type: none"> <li>• Problem Analysis Ability</li> <li>• Ability to Design Solutions</li> <li>• Ability to Implement Solutions</li> </ul> Oral final exam (100%), for those with dyslexia	

### ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*
- *Related academic journals:*

S. Russell, P. Norvig, Artificial Intelligence: A Modern Approach, 2022.

Artificial Intelligence  
Artificial Intelligence in Engineering  
IEEE Intelligent Systems  
Information Sciences  
IEEE Transactions on Pattern Analysis and Machine Intelligence  
Cognitive Systems Research  
Engineering Applications of Artificial Intelligence  
Expert Systems with Applications  
Pattern Recognition  
Pattern Recognition Letters