



UNIVERSIDADE LUSÍADA  
LISBOA

Course Unit Program  
Artificial Intelligence

Academic Year 2026/2027

**1. Organic Unit**

Faculty of Business and Economic Sciences

**2. Course**

Computer Engineering

**3. Cycle**

1st

**4. Course Unit**

Artificial Intelligence (L9027)

**5. Scientific Area**

**6. Curricular Year**

3rd

**7. Type of Curricular Unit / Semester**

1st Semester



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#### 8. Class type and workload (work time)

|                               |       |
|-------------------------------|-------|
| Theoretical classes:          |       |
| Practical classes:            |       |
| Theoretical-Practical Classes | 30,00 |
| Tutorial Guidance:            | 20,00 |

#### 9. ECTS Credits

6,00

#### 10. Scientific Area Coordinator

#### 11. Regent

Prof. Doutor JOAQUIM MESQUITA DA CUNHA VIANA

#### 12. Assistants

#### 13. Teaching Language

Portuguese

#### 14. General Objectives

To teach the basic AI techniques, the problems they are applied to, as well as their limitations

#### 15. Specific Objectives

This course goes through the most well known algorithms and their applications for problem solving. The main focus is on knowledge rationalization through propositional logic as well as 1st order logic, using structured methods and monte-carlo techniques for automated decision processes, with probabilistic models and the resulting inferences.

#### 16. Skills to be acquired

- At the end of this course, students shall be able to:
- Identify and characterize various types of intelligent agents;
  - Apply informed and non informed search algorithms to the resolution of problems;
  - Model knowledge, using propositional and first order logic;
  - Evaluate decisions in uncertainty contexts, based on probabilistic models;
  - Implement basic automatic learning techniques, including, decision trees and neural networks.

#### 17. Teaching Methodology

Lectures will be based on the oral transmission of the information related to the subjects being studied, followed by the resolution of adequate problems.



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## 18. Course Unit Program

1. INTRODUCTION
2. AGENTS
  - 2.1 The nature of environments
  - 2.2 The structure of the agents
3. SEARCH
  - 3.1 Performance measures
  - 3.2 Non-informed search strategies
  - 3.3 Informed search and exploration
4. KNOWLEDGE AND REASONING
  - 4.1 Propositional logic
  - 4.2 1st order logic
  - 4.3 Inference
5. UNCERTAINTY
  - 5.1 Decision taken in an uncertainty environment
  - 5.2 Probabilities theory
  - 5.3 Bayes rule and its applications
  - 5.4 Inference in an uncertainty situation
6. LEARNING
  - 6.1 Learning methods
  - 6.2 Inductive learning
  - 6.3 Decision trees
  - 6.4 Introduction to the statistical learning methods
  - 6.5 Introduction to Neural Networks

## 19. Assessment Methods

The present Complementary Regulation for Knowledge and Competencies shall be applied. Continuous evaluation consists of oral interventions and a final written test, both with factor 3, not excluding the possibility of other evaluation elements, as defined by the Continuous evaluation Plan. The frequency test and the determination of the final information shall obey the present active Regulation.

## 20. Didactic Resources

The teaching resources shall be based on the suggested bibliography, on several pertinent technical papers, on the set of slides used during classes, and on some videos of interest for the studied themes.

## 21. Sustainability Objectives



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This course contributes to the following Sustainable Development Objectives(ODS):

- ODS 5 -Gender Equality: assuring an inclusive and fair transmission of knowledge related to technological areas;
- ODS 9 -Industry, innovation and infrastructure: by, more specifically, transmitting applied knowledge in the, rather up to date, field of Artificial Intelligence in order to contribute to the improvement of citizens life;
- ODS 11 -Sustainable Cities and Communities: By contributing for the efficienc

## 22. Keywords

Intelligent agents  
Search  
Uncertainty  
Learning



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### 23. Main Bibliography

Author(s): Stuart Russell & Peter Norvig  
Title: Artificial Intelligence - A modern approach  
Edition: Global Edition Year: 2021  
Local:  
Publisher: Pearson Education  
ISBN Code:

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Author(s): Ernesto Costa e Anabela Simões  
Title: Inteligência Artificial, Fundamentos e Aplicações  
Edition: 2 Year: 2008  
Local:  
Publisher: FCA  
ISBN Code:

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Author(s): Kevin Murphy  
Title: Probabilistic Machine Learning: An Introduction  
Edition: 1<sup>a</sup> Year: 2022  
Local:  
Publisher: MIT Press  
ISBN Code:

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### 24. Complementary Bibliography

Author(s): George Luger  
Title: Artificial Intelligence: Structures and Strategies for Complex Problem Solving  
Edition: 6 Year: 2008  
Local:  
Publisher: Pearson  
ISBN Code:

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Author(s): Michael Negnevitsky  
Title: Artificial Intelligence: A Guide to Intelligent Systems  
Edition: 4 Year: 2024  
Local:  
Publisher: Pearson  
ISBN Code:



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| Ficha técnica MIP / MIP Datasheet |                                                                        |
|-----------------------------------|------------------------------------------------------------------------|
| Título / Title                    | Course Unit Program 'INTELIGÊNCIA ARTIFICIAL': Academic Year 2026/2027 |
| Autor / Author                    | Prof. Doutor JOAQUIM MESQUITA DA CUNHA VIANA                           |
| Classificação / Classification    | -                                                                      |
| Descritores / Descriptors         | -                                                                      |
| Colaborador(es) / Colaborator(s)  | -                                                                      |
| Data Hora / Date Time             |                                                                        |
| Formato de dados / Data Format    | Texto / Text, PDF                                                      |
| Estatuto de utilização / Usage    | Acesso público / Public Access                                         |
| Relação / Relation                | Version 1,0                                                            |
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