Course guide
220608 - 220608 - Artificial Intelligence Techniques and Automation Applications

Last modified: 11/04/2025

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.

Degree: MASTER'S DEGREE IN AUTOMATIC SYSTEMS AND INDUSTRIAL ELECTRONICS (Syllabus 2012). (Optional subject).

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Bernardo Morcego - BERNARDO MORCEGO SEIX

Others: Jordi Damunt - JORDI DAMUNT MASIP

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Research, analysis and characterization of the use of artificial programming techniques in the control and automation of manufacturing processes.

Transversal:
3. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
5. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

Basic:
2. Improve technical communication of results.
4. Improve self-learning capacity

TEACHING METHODOLOGY

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LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

Type	Hours	Percentage
Hours small group	14,0	11.20
Hours large group	31,0	24.80
Self study	80,0	64.00

Total learning time: 125 h

CONTENTS

(ENG) -

Full-or-part-time: 8h
Theory classes: 4h
Self study : 4h

(ENG) Mòdul 2: Representació del coneixement

Description:
(ENG) Representació borrosa del coneixement
Fonaments de les xarxes neuronals
Perceptró i perceptró multicapa

Related activities:
(ENG) Activitat 1
Activitat 4
Activitat 5

Full-or-part-time: 35h
Theory classes: 9h
Laboratory classes: 4h
Self study : 22h

(ENG) Mòdul 3: Aprenentatge

Full-or-part-time: 45h
Theory classes: 10h
Laboratory classes: 6h
Self study : 29h

(ENG) Mòdul 4: Resolució de problemes

Full-or-part-time: 37h
Theory classes: 8h
Laboratory classes: 4h
Self study : 25h

ACTIVITIES

(ENG) ACTIVITAT 1: CLASSES DE TEORIA

Full-or-part-time: 31h
Theory classes: 21h
Self study: 10h

(ENG) ACTIVITAT 2: TREBALL EN GRUP

Full-or-part-time: 36h
Theory classes: 8h
Self study: 28h

(ENG) ACTIVITAT 3: TREBALL EN GRUP (MEMÒRIA)

Full-or-part-time: 12h
Self study: 12h

(ENG) ACTIVITAT 3: PRÀCTIQUES

Full-or-part-time: 28h
Laboratory classes: 14h
Self study: 14h

(ENG) ACTIVITAT 4: EXAMEN FINAL

Full-or-part-time: 18h
Theory classes: 2h
Self study: 16h

GRADING SYSTEM

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EXAMINATION RULES.

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BIBLIOGRAPHY

Basic:
- Fausett, Laurene V. Fundamentals of neural networks: architectures, algorithms and applications. Englewood Cliffs: Prentice Hall International, 1994. ISBN 0130422509.
- Martín del Brío, B.; Sanz Molina, A.. Redes neuronales y sistemas borrosos. 2ª ed. Madrid: Ra-ma, 2001. ISBN 8478974660.

Complementary:
- Rich, E.; Knight, K. Inteligencia artificial. 2ª ed. Madrid: McGraw-Hill, 1994. ISBN 8448118588.
- Michalewicz, Zbigniew. Genetic algorithms + data structures = evolution programs. 3rd ed. Berlin: Springer-Verlag, 1996. ISBN 3540606769.
- Jang, J.-S.R.; Sun, C.-T.; Mizutani, E. Neuro-fuzzy and soft computing: a computational approach to learning and machine intelligence. Upper Saddle River (N.J.): Prentice-Hall, 1997. ISBN 0132610663.
- Sutton, R.S.; Barto, A.G. Reinforcement learning: an introduction. Cambridge: MIT Press, 1998. ISBN 0262193981.