Artificial Intelligence

Academic Year: (2022 / 2023) **Review date: 25-05-2022**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: MOLINA LOPEZ, JOSE MANUEL

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Programming (Course: 1 / Semester: 1)
Discrete Mathematics: (Course: 1 / Semester: 2)

SKILLS AND LEARNING OUTCOMES

¿ Know different knowledge representation techniques, with and without uncertainty, used in artificial intelligence and apply them to select the most appropriate one.
¿ Know the main techniques of search and reasoning with uncertainty in the context of artificial intelligence and apply them to real-world problems.

OBJECTIVES

In this course the fundamentals of Artificial Intelligence techniques will be seen from the conceptual point of view and from the practical point of view.

DESCRIPTION OF CONTENTS: PROGRAMME

1. An Introduction of AI
2. Production Systems
3. Search
a. Introduction
b. Uninformed Search
c. Heuristic Search
4. Uncertainty
a. Probability calculus
b. Bayesian calculus. Bayes theorem. Bayesian inference. Bayesian Networks
c. Markov based models. Markov chains. Markov models. Hidden Markov Models. Markov Decision Processes (MDP). Partially observable MDPs (POMDP).
d. Fuzzy logic
5. Robotics
6. Applied Artificial Intelligence

LEARNING ACTIVITIES AND METHODOLOGY

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THEORETICAL-PRACTICAL CLASSES. [44 hours with 100% classroom instruction, 1.67 ECTS]
Knowledge and concepts students must acquire. Student receive course notes and will have basic reference texts to facilitate following the classes and carrying out follow up work. Students partake in exercises to resolve practical problems and participate in workshops and evaluation tests, all geared towards acquiring the necessary capabilities.

TUTORING SESSIONS. [4 hours of tutoring with 100% on-site attendance, 0.15 ECTS]
Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher.

STUDENT INDIVIDUAL WORK OR GROUP WORK [98 hours with 0 % on-site, 3.72 ECTS]

WORKSHOPS AND LABORATORY SESSIONS [8 hours with 100% on site, 0.3 ECTS]

FINAL EXAM. [4 hours with 100% on site, 0.15 ECTS]
Global assessment of knowledge, skills and capacities acquired throughout the course.

METHODOLOGIES

THEORY CLASS. Classroom presentations by the teacher with IT and audiovisual support in which the subject's main concepts are developed, while providing material and bibliography to complement student learning.

PRACTICAL CLASS. Resolution of practical cases and problem, posed by the teacher, and carried out individually or in a group.

TUTORING SESSIONS. Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with a teacher as tutor.

LABORATORY PRACTICAL SESSIONS. Applied/experimental learning/teaching in workshops and laboratories under the tutor's supervision.

ASSESSMENT SYSTEM

EVALUATION SYSTEMS

SE1 - FINAL EXAM. [40 %]
Global assessment of knowledge, skills and capacities acquired throughout the course.

SE2 - CONTINUOUS EVALUATION. [60 %]
Assesses papers, projects, class presentations, debates, exercises, internships and workshops throughout the course.

% end-of-term-examination:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

BASIC BIBLIOGRAPHY

- S. Russell, P. Norvig Artificial Intelligence, Prentice Hall , 2009