Artificial Intelligence

Academic Year: (2020 / 2021)   **Review date: 28/06/2020 20:40:42**

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)

Mathematics and Statistics

OBJECTIVES

Students will demonstrate:
-         Knowledge and understanding of IA supported by advanced textbooks including research aspects.
-         Knowledge and application of basic Artificial Intelligence (AI) algorithmic procedures to design solutions to problems, analyzing the appropriateness and complexity of the proposed algorithms.
-         Knowledge and application of the fundamental principles and basic techniques of intelligent systems and their practical application.
General competences:
- Analysis (PO a)
- Abstraction (PO a)
- Problem solving (PO c)
- Capacity to apply theoretical concepts   (PO c)
Specific competences
- Cognitive
1. Evaluation based on multiple Theoretical IA tasks (PO a)
- Procedural/Instrumental
2. Students should use different AI techniques, compare them through experiments, and analyze the results (PO b)
3. Students should apply the right and appropriate AI technique and parameters to solve a task (objective) (PO c)
- Attitudinal
4. Students should work on the homeworks in teams (PO d)
5. Students are required to use AI tools and provide solutions to real-world problems through computer engineering (PO e)
6. Students must present a written summary of each homework. The final homework should be orally presented, and the final exam is written (PO g)
7. Students should be able to use state of the art AI tools to solve homework tasks (PO k)

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

Theoretical lectures: 2 ECTS. To achieve the specific cognitive competences of the course (PO a).
Practical lectures: 2,5 ECTS. To develop the specific instrumental competences and most of the general competences, such as analysis, abstraction, problem solving and capability to apply theoretical concepts. Besides, to develop the specific attitudinal competences. (PO a, c, d, f, g).
Guided academic activities (present teacher): 1,5 ECTS. The student proposes a project according to the teachers guidance to go deeply into some aspect of the course, followed by public presentation (PO a, c, d, g, k).

ASSESSMENT SYSTEM

% end-of-term-examination/test: 40

% of continuous assessment (assigments, laboratory, practicals…):   60

Exercises and examinations are both learning and evaluation activities. The evaluation system includes the assessment of guided academic activities and practical cases, with the following weights:
Examination: 40% (PO a)
Exercises: 30% (PO b, c, d, e)
Practical case: 30% (PO a, c, d, g)

BASIC BIBLIOGRAPHY

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