

Academic Year: (2024 / 2025)

Review date: 25-04-2024

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: CASTRO GONZALEZ, ALVARO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Students are expected to know structured programming and object-oriented programming. Students will use C++ during the lab sessions. If the student is not familiar with this programming language, we will provide learning resources.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction to robotics
2. Perception in robotics
3. Actuation in robotics
4. Navigation
5. Decision making
6. Human-robot interaction

LEARNING ACTIVITIES AND METHODOLOGY

Learning activities:

- AF1 - Theoretical session
- AF2 - Lab sessions
- AF3 - Theoretical-practical sessions
- AF5 - Tutorial support sessions
- AF6 - Workgroup
- AF7 - Individual student work
- AF8 - Miterm and final exams

Methodology:

- MD1 - Class lectures by the professor with computer and audiovisual media support, in which the main concepts of the subject are developed and the bibliography is provided to complement the student's learning.
- MD2 - Critical reading of texts recommended by the professor of the subject: press articles, reports, manuals, and/or academic articles, either for later discussion in class or to expand and consolidate the knowledge of the subject.
- MD3 - Resolution of practical cases, problems, etc. posed by the teacher individually or in groups.
- MD4 - Presentation and discussion in class, under the moderation of the professor, of topics related to the content of the subject, as well as case studies.
- MD5 - Elaboration of works and reports individually or in groups.

ASSESSMENT SYSTEM

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

Assessment systems used:

- SE1 - Class participation
- SE2 - Individual or group work completed during the course
- SE3 - Final exam

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

Continuous assessment: 40%.

- lab sessions: 30% (min. 5 points)

- Application presentation: 10%

Final exam: 60% (min. 5 points)

Extraordinary exam: 100% with all the content (including the content of the lab sessions).

BASIC BIBLIOGRAPHY

- Mataric, M. J. The robotics primer, The MIT Press, 2007

- Matja Mihelj, Tadej Bajd, Ale Ude, Jadran Lenar, Ale Stanovnik, Marko Munih, Jure Rejc, Sebastjan A Lajpah Robotics (2nd edition), Springer, 2019

- Roland Siegwart, Illah Reza Nourbakhsh, Davide Scaramuzza Introduction to autonomous mobile robots, MIT Press, 2011

- Siciliano, B.; Khatib, O. Springer Handbook of Robotics (2nd ed.), Springer, 2016

BASIC ELECTRONIC RESOURCES

- Cyberbotics . Documentation of Webots: <https://cyberbotics.com/doc/guide/index>