Human-robot Interaction

Academic Year: (2023 / 2024)   **Review date: 14-02-2022**

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher:

Type: Compulsory ECTS Credits : 3.0

Year : 4 Semester : 1

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction to human-robot interaction (HRI)
   a. Physical and mental interaction
   b. Humanoid robots (arms, legs, torso, head)
2. Technical and human factors
   a. Physical space sharing among humans and robots
   b. Typology of the users of HMI
3. HRI of teleoperated robots
   a. Haptic devices
   b. Safe teleoperation of robots, collision control. master-slave model
   c. Teleoperation architectures (bidirectional, with exclusions, with delays)
4. HRI of autonomous robots
   a. User oriented design
   b. Safe interaction with autonomous robots (users, environments, multirobots)
   c. Autonomous robots interaction architectures (planning, deliberating)
5. Multimodal physical human-robot interaction
   a. Body and verbal interaction (gesture, voice, corporal expression, etc.)
   b. Robot corporal and verbal replication of robots (robotic empathy)
6. HRI applications (healthcare, rehabilitation, personal robots)

LEARNING ACTIVITIES AND METHODOLOGY

THEORETICAL PRACTICAL CLASSES.
Knowledge and concepts students must acquire. Receive course notes and will have basic reference texts. Students partake in exercises to resolve practical problems.

TUTORING SESSIONS.
Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher. Subjects with 6 credits have 4 hours of tutoring/ 100% on- site attendance.

STUDENT INDIVIDUAL WORK OR GROUP WORK.
Subjects with 6 credits have 98 hours/0% on-site.

WORKSHOPS AND LABORATORY SESSIONS.
Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.

ASSESSMENT SYSTEM

FINAL EXAM.
Global assessment of knowledge, skills and capacities acquired throughout the course. The percentage of the evaluation varies for each subject between 60% and 0%.

CONTINUOUS EVALUATION.
Assesses papers, projects, class presentations, debates, exercises, internships and workshops throughout the course. The percentage of the evaluation varies for each subject between 40% and 100% of the final grade.

% end-of-term-examination: 60

% of continuous assessment (assigments, laboratory, practicals…):   40