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Biomedical applications of robotics

Academic Year: (2023 / 2024)   **Review date: 28-04-2023**

Department assigned to the subject: Bioengineering Department

Coordinating teacher: PASCAU GONZALEZ GARZON, JAVIER

Type: Electives ECTS Credits : 3.0

Year : 4 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)
Computer vision

OBJECTIVES
The objective of this course is to provide students with a broad perspective on robotic concepts and technologies applied to (and inspired by) biomedical research and practice.

DESCRIPTION OF CONTENTS: PROGRAMME
1 Introduction
2 Robots for biomedical research
3 Surgery robotics, teleoperation, cooperative manipulation
5 Robotics prosthetics
6 Neuro-rehabilitation robotics
7 Medical imaging
8 Biomimetic robotics

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

BASIC BIBLIOGRAPHY
 - J. P. Desai, S. Agrawal, A. Ferreira, R. V. Patel (Editors) The Encyclopedia of Medical Robotics 4 Volumes., World Scientific., 2019