

Teaching guide

IDENTIFICATION DETAILS

Degree:	Diploma in Robotics and IoT		
Field of Knowledge:	Engineering and Architecture		
Faculty/School:	Senior Polytechnic School		
Course:	APPLICATION OF ROBOTICS		
Type:	Compulsory Internal	ECTS credits:	3
Year:	4	Code:	56219
Teaching period:	Eighth semester		
Teaching type:	Classroom-based		
Language:	English		
Total number of student study hours:	75		

Teaching staff	E-mail
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SUBJECT DESCRIPTION

Se presentan diferentes opciones para desarrollar un proyecto de construcción de un robot o de un controlador de un robot que se llevará a cabo a lo largo del cuatrimestre.

Different options are presented to develop a project to build a robot or a robot controller that will be carried out throughout the semester.

GOAL

Learn to plan and manage a project related to Robotics.

The project may involve the construction of a robot and/or the development of a controller that governs the operation of a robot, the code of the control system or the performance of the necessary simulations prior to the construction of a robot.

Once the subject has been completed, the student will know how to apply all the knowledge acquired throughout the degree to develop and use robots.

PRIOR KNOWLEDGE

Knowledge of the fundamental subjects of robotics, electronics, programming and artificial intelligence corresponding to all the subjects of the Degree is essential.

In addition, any knowledge of control theory, microprocessor programming, sensors, project management... is positive.

COURSE SYLLABUS

- 1.- Development of Robotics projects.
- 2.- Planning a project.
- 3.- Documentation of a project.
- 4.- Development of a project.
- 5.- Presentation of a project.

The entire subject will revolve around a project freely selected by the student and which must be managed from the initial idea to its final evaluation.

EDUCATION ACTIVITIES

At the beginning of the semester, students will be able to propose different projects for the construction and development of a robot or an application related to robotics.

The teacher will validate the project and from that moment the student will dedicate time to the construction of said robot.

- 1.- There will be mainly laboratory sessions supported by the teacher, and expository lessons. The Virtual Classroom will be available with support material and as a place to present and deliver the documents made.

- 2.- The previous temporary planning must be presented, this is the Gantt chart or equivalent. Costs and necessary resources must also be included.
- 3.- As the project develops, it should be documented in a memory that would facilitate the reproduction of the project after a while.
- 4.- Attempts should be made to achieve the objectives set in the initial planning.
- 5.- The project must be presented and defended, explaining which objectives have been achieved and which have not.
- 6.- A critical self-assessment must be carried out, correcting the planning carried out at the beginning and doing it again with the data obtained after the actual development

DISTRIBUTION OF WORK TIME

CLASSROOM-BASED ACTIVITY	INDEPENDENT STUDY/OUT-OF-CLASSROOM ACTIVITY
32 hours	43 hours
Lección expositiva 2h Tutorías 2h Laboratorio 26h Evaluación 2h	Trabajo en grupo 13h Estudio y trabajo individual 30h

SKILLS

Dirección y realización de un proyecto de robótica, desde su idea inicial hasta la presentación final, gestionando recursos, tiempos y costes.

LEARNING RESULTS

Entender la necesidad de aplicar procesos de planificación y gestión a los proyectos de desarrollo de sistemas robóticos.

Conocer herramientas, técnicas y metodologías de planificación de proyectos de desarrollo de sistemas de robótica y aplicarlas, llevando al día la agenda del proyecto.

Entender los aspectos humanos clave en el desarrollo de un proyecto informático y aplicar estrategias que atiendan a estos aspectos en la gestión de personas.

LEARNING APPRAISAL SYSTEM

This subject is the equivalent to the final project of the "Título Propio". The final mark of the subject will depend on three sections: planning, project development and presentation and demonstration of the final operation of the software or the built or simulated robot evaluated with the following percentages: 20% Planning (4 hours/ 2 weeks) 50% Development (16 hours / 8 weeks) 30% Presentation / Documentation (6 hours / 3 weeks) La nota final de la asignatura será proporcional a la complejidad/dificultad del proyecto. Para la evaluación de cada parte se empleará una rúbrica que será similar a la del Trabajo de fin de Grado. La entrega de los documentos en español supondrá una reducción del 20% de la nota. 20% Planificación (4 horas/2 semanas) del proyecto (costes, hitos y plazos): Final enero. En este momento los propios alumnos realizarán una autoevaluación de la nota máxima a la que aspiran con su proyecto, en función de su dificultad, de si es real o no, de su originalidad, de si contiene o no control, etc. 50% Desarrollo (16 horas / 8 semanas): Comienzo de abril. Se debe realizar una memoria similar a la que tendría un proyecto de fin de grado, con los mismos puntos. 30% Presentación / Demostración práctica si es preciso (6 horas / 3 semanas): Dos o tres últimas semanas del curso. De nuevo el alumno realizará una autoevaluación que contemplará si ha alcanzado los objetivos marcados inicialmente en la planificación o no. The final mark of the subject will be proportional to the complexity/difficulty of the project. For the evaluation of each part, a rubric will be used that will be similar to that of the Final Degree Project. The delivery of the documents in Spanish will suppose a reduction of 20% of the note. 20% Planning (4 hours/2 weeks) of the project (costs, milestones and deadlines): End of January. At this time, the students themselves will carry out a self-assessment of the maximum grade to which they aspire with their project, depending on its difficulty, whether it is real or not, its originality, whether or not it contains control, etc. 50% Development (16 hours / 8 weeks): Beginning of April. A memory similar to that of a final degree project should be made, with the same points. 30% Presentation / Practical demonstration if necessary (6 hours / 3 weeks): Two or three last weeks of the course. Once again, the student will carry out a self-assessment that will consider whether or not they have achieved the objectives initially set in the planning. Failure to meet deadlines will result in a penalty of up to 25% of the grade. In the ordinary and extraordinary calls, the three sections must be delivered and have a grade greater than 5 in all three. Those students who are exempt from the obligation to attend class, either because of the second enrollment in the subject or successive ones, or because they have express authorization from the Degree Direction, will be evaluated by the same type of tests. For the purpose of calculating calls in a subject, only those in which the student has taken all the assessment tests, or a part of them, will be counted as consumed, provided that their weight in the final grade exceeds 50%. Even if you don't take the final exam. It will be understood that a student has taken a test even if he or she abandons it once it has begun. The condition of Not Presented in the extraordinary call will be linked to the non-attendance or delivery of any test, practice or work that is pending. Any type of fraud or plagiarism by the student in an evaluable activity will be sanctioned as stated in the UFV Coexistence Regulations. For these purposes, "plagiarism" will be considered any attempt to defraud the evaluation system, such as copying in exercises, exams, practices, assignments or any other type of delivery, either from another classmate, or from unauthorized materials or devices, with the in order to make the teacher believe that they are their own.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

Jeremy Blum Exploring Arduino: Tools and Techniques for Engineering Wizardry 2^a
Editorial : John Wiley & Sons Inc. ISBN-13 : 978-1119405375

Anbazhagan k Best DIY Projects using Arduino and using Robotic technology 1^a

- ISBN-13 : 978-1694036773