DATOS DE IDENTIFICACIÓN

<table>
<thead>
<tr>
<th>Titulación:</th>
<th>Experto en Robótica (Título Propio asociado a Ingeniería Informática)</th>
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<tbody>
<tr>
<td>Facultad/Escuela:</td>
<td>Escuela Politécnica Superior</td>
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<tr>
<td>Asignatura:</td>
<td>Introducción a la Robótica</td>
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<td>Tipo:</td>
<td>Propia Obligatoria</td>
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<td>Créditos ECTS:</td>
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<td>Curso:</td>
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<td>Código:</td>
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<td>Periodo docente:</td>
<td>Primer semestre</td>
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<td>Tipo de enseñanza:</td>
<td>Presencial</td>
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<tr>
<td>Idioma:</td>
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<tr>
<td>Total de horas de dedicación del alumno:</td>
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Equipo Docente

<table>
<thead>
<tr>
<th>Equipo Docente</th>
<th>Correo Electrónico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pablo Fernández Blanco</td>
<td><a href="mailto:p.fblanco.prof@ufv.es">p.fblanco.prof@ufv.es</a></td>
</tr>
</tbody>
</table>

DESCRIPCIÓN DE LA ASIGNATURA

Introduction to robotics is the first subject of Robotics master which is an extension of Computer Science degree. This course covers the introduction to what is understood by robotics in the different disciplines of engineering, such as electronics, industrial and computer science. Taking into account the historical evolution of robots across the last five decades, the main goals achieved are presented and crosschecked with the state-of-the-art in the information management technologies. Introduction to robotics is a fundamentally theoretical subject where the student will be asked for a active participation, investigating and realizing about how computer processing is a core element of a robot for most of the capacities developed today.

OBJETIVO

The overall objectives of this subject are:
Teach knowledge about the purposes of Robotics, especially on the computer side, and understand which are the main achievements and technological challenges in this matter.
Develop real cases of robotic systems and research projects today.
Introduce the historical evolution of Robotics since its inception.
Enumerate the different achievement in mechanics, electronics and Computer Science.
Learn about the parts of a robot.
Identify different types of sensors and actuators.
Introduce different technologies for the development of these devices.
Develop Robotics computer science skills.
Distinguish between industrial and service Robotics.
Study specific cases of Robotics research where the Artificial Intelligence inside a robot is fundamental.
Promote discussions on the possible applications of Robotics.
Introduction to Robotics trends and forecasts in the coming years and decades.

CONOCIMIENTOS PREVIOS

Knowledge of English B2 level to follow the subject.
The student will not require neither basic knowledge of Robotics nor Computer Science notions due to the fact it is a pure introductory subject with no technical constraints.

CONTENIDOS

THEME 1. Introduction
- Introduction to robotics. Objectives of Robotics
- History of Robotics
- Definitions and classifications
- Disciplines and competencies of Robotics
- Society impact and the future

THEME 2. Applications of robotics.
- Industrial robotics
- Service robotics
- State of the art
- Research lines

THEME 3. Computer Science in Robotics
- Computer Intelligence: Robot’s software organization strategy approaches
- Local navigation
- The robot and its parts
- Sensors
- Actuators
- Homogeneous Coordinates

ACTIVIDADES FORMATIVAS

During the teaching of this subject the interaction between the students and the teacher will be essential, trying to capture their attention and get them more involved with the objectives. The professor will raise discussion events inducing students to think about the recent learning.

Classroom activities will be complemented with student's autonomous work. Also group collaboration will be required during exhibition preparations in some classes.

All study and work performed by the student will be reviewed and mentored by the teacher.

Finally, in order to facilitate students with access to necessary materials, as well as a way to practice efficient communication with the teacher, the virtual classroom (Moodle) will be an active learning channel during the full course.
**DISTRIBUCIÓN DE LOS TIEMPOS DE TRABAJO**

<table>
<thead>
<tr>
<th>ACTIVIDAD PRESENCIAL</th>
<th>TRABAJO AUTÓNOMO/ACTIVIDAD NO PRESENCIAL</th>
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<tbody>
<tr>
<td>18 horas</td>
<td>19,50 horas</td>
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<tr>
<td>Development and exhibition of groups practices 5h</td>
<td>Individual study 10h</td>
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<tr>
<td>Expository Lesson 8h</td>
<td>Teamwork 9,50h</td>
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<tr>
<td>Examination 2h</td>
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<tr>
<td>Tutoring 3h</td>
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</tr>
<tr>
<td>Individual study 10h</td>
<td></td>
</tr>
<tr>
<td>Teamwork 9,50h</td>
<td></td>
</tr>
</tbody>
</table>

**COMPETENCIAS**

Identify the main parts of a robot and the main purposes of each one.

Relate different topics of Computer Science with the development needs in Robotics and to identify the different technological challenges in the context of Computer Science discipline.

**RESULTADOS DE APRENDIZAJE**

The student will be able to identify the main parts of a robot and the main purposes of each one.

After completing the course, the student will have the ability to relate different subjects of computer science with the development needs in robotics. In addition, identify the different technological challenges in the context of computer science discipline.

**SISTEMA DE EVALUACIÓN DEL APRENDIZAJE**

The evaluation system includes at least three different types of tests:

1) Individual test. An individual exam will be performed at the end of the course period in order to check the concepts learning and understanding of knowledge. The score of the component will be 60% of final rate.

2) Work practices exhibitions will mean 30%.

3) Class attendance and active involvement in class will score the remaining 10%.

In the three items is necessary to get above 5 over 10 to pass the course.

Below is described the evaluation system including deliveries, dates and percentage in final qualification.

- Individual test: Last week November 2017 (60%)
- Work Practices and exhibitions: Every class day from the second one to December (30% + 10%)
- Resit in January

It will be possible to add student practices (individual or group based), without taking into account exhibitions rates, for increasing final qualification.

Resit in July
In both cases the student will be presented only to evidence which note is below 5.

Those students who are exempt from the obligation to attend class, either by second enrollment in the subject or successive, or by having the express authorization of the Degree Management, will be evaluated by the same type of tests. 10% of the participation in class may obtain it by attending at least three tutorials with the teacher responsible for the subject.

For the purpose of counting calls in a subject, only those in which the student has attended to all the evaluation tests, or a part of them, will be counted as consumed, provided that their weight in the final mark exceeds 50%, even if it is not submitted to the final exam. It will be understood that a student has attended to a test although he leaves it once it has begun. The condition of "No Presentado" in the extraordinary call will be linked to the non attendance or delivery of any evidence, practice or work that is pending.

BIBLIOGRAFÍA Y OTROS RECURSOS

Básica

Subject documentation available at Virtual Classroom (Moodle).

Complementaria

Behaviors Based Robotics, ARKIN, Ronald C., MIT Press, 1998