Course guide

320191 - ROBAS - Basic Robotics

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.

Degree:
BACHELOR’S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR’S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR’S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR’S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR’S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR’S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR’S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR’S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR’S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2023 ECTS Credits: 6.0 Languages: Catalan

LECTURER

Coordinating lecturer: Josep Cugueró i Escofet
Others: Jaume Figueras i Jové
Laureano Tinoco Gómez

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## Basic Concepts

**Description:**
- History of the robotics
- Fields of application

**Specific objectives:**
Understanding basic concepts within the world of robotics.

**Full-or-part-time:** 6h
Theory classes: 2h
Self study: 4h

## Robots and Manipulators

**Description:**
content english

**Full-or-part-time:** 12h
Theory classes: 4h
Self study: 8h

## Types of Robots

**Description:**
- Introduction.
- Industrial Robots:
  - fundamental characteristics.
  - Types of Robots.
  - specific Sensors.
- Mobile Robots:
  - terrestrial Robots
  - fundamental Characteristics.
  - specific Sensors
- air Robots
  - fundamental Characteristics.
  - specific Sensors
- submarine Robots
  - fundamental Characteristics.
  - specific Sensors
- Other robots

**Full-or-part-time:** 66h
Theory classes: 8h
Laboratory classes: 22h
Self study: 36h
### End Effectors

**Description:**
- End effectors: Fundamental characteristics.
- Types of End effectors.
- End effectors: Specific design.

**Full-or-part-time:** 6h  
Theory classes: 2h  
Self study: 4h

### Geometric concepts

**Description:**
- Object position and orientation
- Reference frames used by a robotic system.
- Introduction to robot kinematics

**Full-or-part-time:** 15h  
Theory classes: 5h  
Self study: 10h

### Robot Programming

**Description:**
- Introduction to robot programming.
- Programming types.
- Programming Languages: basic and advanced features.
- The robot as a multi task system:
- Flow control in a robot system programming
- Task Control in a robot system programming

**Full-or-part-time:** 30h  
Theory classes: 4h  
Laboratory classes: 8h  
Self study: 18h

### Robot Application Fields

**Description:**
- Introduction to the task robotization
- Adapting the environment to the robot or adapting the robot to the environment.
- Fields of robot application:
  - Service Robotics
  - Medical Robotics
  - Industrial Robotics
  - Robotic in education
- ...

**Full-or-part-time:** 12h  
Theory classes: 4h  
Self study: 8h
Safety

Description:
- Safety and protection elements
- Safety regulation in the robotized environments

Full-or-part-time: 3h
Theory classes: 1h
Self study: 2h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

RESOURCES

Audiovisual material:
- Nom recurs. Resource