320191 - ROBAS - Basic Robotics

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control
Academic year: 2019
Degree: BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Teaching unit Optional)

ECTS credits: 6
Teaching languages: Catalan

Teaching staff
Coordinator: Josep Cugueró i Escofet
Others: Jaume Figueras i Jové
Laureano Tinoco Gómez

Learning objectives of the subject

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h</th>
<th>20.00%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group: 30h</td>
<td>20.00%</td>
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<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
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## Basic Concepts

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

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

**Learning time:** 6h  
- Theory classes: 2h  
- Self study: 4h

## Robots and Manipulators

**Description:**
- content english

**Learning 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

**Learning 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.

**Learning 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

**Learning 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

**Learning time:** 30h
- Theory classes: 4h
- Laboratory classes: 8h
- Self study: 18h
Robot Application Fields

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>- Introduction to the task robotization</td>
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<tr>
<td>- Adapting the environment to the robot or adapting the robot to the environment.</td>
</tr>
<tr>
<td>- Fields of robot application:</td>
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<tr>
<td>- Service Robotics</td>
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<tr>
<td>- Medical Robotics</td>
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<tr>
<td>- Industrial Robotics</td>
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<tr>
<td>- Robotic in education</td>
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<td>...</td>
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<table>
<thead>
<tr>
<th>Learning time:</th>
<th>12h</th>
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<tbody>
<tr>
<td>Theory classes:</td>
<td>4h</td>
</tr>
<tr>
<td>Self study:</td>
<td>8h</td>
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Safety

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<th>Description:</th>
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<tbody>
<tr>
<td>- Safety and protection elements</td>
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<tr>
<td>- Safety regulation in the robotized environments</td>
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<tr>
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<tbody>
<tr>
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<tr>
<td>Self study:</td>
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Bibliography

Basic:


Others resources:

Audiovisual material

Nom recurs

Resource