Course guides
240648 - 240648 - Train, Transport and Technology. From Steam to High Speed

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 749 - MAT - Department of Mathematics.
Degree: BACHELOR’S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).
Academic year: 2021  ECTS Credits: 3.0  Languages: Catalan

LECTURER
Coordinating lecturer: Carles Puig Pla

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
1. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
2. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

TEACHING METHODOLOGY

Presentation sessions of different topics, supplemented by the use of ICT and individual resources
Cooperative learning based on case studies; oral presentations and delivering papers by students
Case studies preparation, based on library resources and web resources

LEARNING OBJECTIVES OF THE SUBJECT

- 1. To explain the main contributions of the pioneers of steam engines in Europe and Catalonia.
- 2. To identify major technological progress in railway locomotives at different times and historical contexts.
- 3. To describe the main features of the history of the construction of the railway network in Spain and Catalonia.
- 4. To recognize the most significant changes that have contributed to the development of rail transport from the nineteenth to the twenty-first century.
- 5. To explain the most important characteristics of high-speed and magnetic levitation railway.
- 6. To use library resources and the Internet to find study materials related to the history of transportation and railway technology.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>30,0</td>
<td>40.00</td>
</tr>
<tr>
<td>Self study</td>
<td>45,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 75 h
## Item 1. - The steam engine

**Description:**

**Specific objectives:**
The student achieves objectives 1 and 6

**Related activities:**
Apart from the theoretical introduction classes and group activities in class, see below.

**Related competencies:**
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

**Full-or-part-time:** 15h  
Theory classes: 6h  
Self study : 9h

## Item 2. The advent of the railway in Europe and America

**Description:**

**Specific objectives:**
that students achieve objectives 2 and 6

**Related activities:**
Apart from the theoretical introduction classes and group activities in class, see below.

**Related competencies:**
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

**Full-or-part-time:** 15h  
Theory classes: 6h  
Self study : 9h
Item 3. Railway network in Spain

Description:

Specific objectives:
that students achieve their goals 3 and 6

Related activities:
Apart from the theoretical introduction classes and group activities in class, see below.

Related competencies:
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

Full-or-part-time: 15h
Theory classes: 6h
Self study : 9h

Item 4.’s Construction of the railway network in Catalonia

Description:
The construction of the railway network in Catalonia. Extension of the line from Mataró to Arenys. From Barcelona to Granollers and successive extensions. From Barcelona to Molins de Rei and Tarragona. Fusion and concentration of railway lines. The Maquinista Terrestre y Marítima Company. The difficult expansion to France, the line of Paris (1878). Electrification of Sarrià Railway. The Mancomunitat and the Network of Secondary Railroads; narrow-gauge railways and rack railway.

Specific objectives:
that students achieve their goals 3 and 6

Related activities:
Apart from the theoretical introduction classes and group activities in class, see below.

Related competencies:
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

Full-or-part-time: 15h
Theory classes: 6h
Self study : 9h
Item 5. Technological development of high speed train

Description:

Specific objectives:
that students achieve goals 4, 5 and 6

Related activities:
Apart from the theoretical introduction classes and group activities in class, see below.

Related competencies:
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

Full-or-part-time: 15h
Theory classes: 6h
Self study: 9h

ACTIVITIES

name english

Description:
The students form groups and prepare a work, assigned by teacher, related to the course content and they will expose it in the classroom.

Specific objectives:
To achieve good oral and written communication as well as good teamwork and to evaluate objective 6

Material:
Library materials and Web resources

Delivery:
Before finishing classes during the exhibition in accordance with the schedule of exhibitions set (according to the number of groups)

Related competencies:
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

Full-or-part-time: 2h
Self study: 2h

name english

Full-or-part-time: 4h
Theory classes: 4h
GRADING SYSTEM

The final mark will be the result of 3 test or evaluations. Their respective weightings are:
T1, T2 & T3: 40%
T4 & T5: 30%
Oral presentation 6 delivering paper: 30%

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Other resources:
Web addresses ICT resources with audiovisual information