240624 - The History of Applied Mathematics in Engineering

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 749 - MAT - Department of Mathematics
Academic year: 2019
Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits: 3
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Mª Rosa Massa Esteve

Prior skills
Students with the knowledge of mathematics of first course could follow easily the course.

Degree competences to which the subject contributes

Transversal:
1. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
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.
3. 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.
4. 06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

Teaching methodology

Learning objectives of the subject
The history of sciences gives a dynamic and humanist view that contribute to the integral formation of students and besides complement the thematic study of the textbooks. The course complements the scientific formation of students, analysing the treats more relevant in the history on the relationship between mathematics and engineering.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group: 0h 0.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group: 30h 40.00%</td>
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<tr>
<td></td>
<td>Hours small group: 0h 0.00%</td>
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<td></td>
<td>Guided activities: 0h 0.00%</td>
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<tr>
<td></td>
<td>Self study: 45h 60.00%</td>
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## 240624 - The History of Applied Mathematics in Engineering

### Content

**Tema 1. Mathematics and engineering in the Antiquity**

**Learning time:** 10h  
- Theory classes: 4h  
- Self study: 6h

**Description:**  

**Tema 2. Engineers-Artists in the Renaissance**

**Learning time:** 20h  
- Theory classes: 8h  
- Self study: 12h

**Description:**  

**Tema 3. The algebrization of mathematics. Scientific Revolution**

**Learning time:** 15h  
- Theory classes: 6h 20m  
- Self study: 8h 40m

**Description:**  

**Tema 4. Applied Mathematics and engineering in the Illustration**

**Learning time:** 20h  
- Theory classes: 10h  
- Self study: 10h

**Description:**  
The works of Leonhard Euler, mathematic and engineer of the eighteenth century: Mechanics of the science of motion 2 volumes (1736). The Encyclopedie and the Illustration. D'Alembert and the applied mathematics.
The final grade is obtained, with the activities done in class, short questions and the final project of the year, broken down as follows.

30% from written or oral practice made each week. Each week, students develop an activity. The activity consists of playing a demo of some text involving mathematics and engineering, a dossier prepared to fill (from a text) or a short summary of a text prepared with questions. Can answer them in writing or orally, can be completed, reviewed, or annotating the text in class, during practice. It assesses the clarity of explanations and our understanding of scientific activity.

30% Short questions on a theme about the relations between engineering and mathematics.

40% from the analysis of a significant demonstration of the text on history of mathematics and engineering. In the evaluation (written and oral presentation) will assess the clarity in the exposition of the ideas of the author chose, as well as the ability to connect the text with the history of mathematics applied to engineering that we have been developed. In case of any demonstration will also analyze the level of scientific understanding.

### Bibliography

**Basic:**


