Course guides
**295901 - EII - Industrial Equipments and Installations**

Unit in charge: Barcelona East School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree:
- 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 MATERIALS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2021  ECTS Credits: 6.0  Languages: Catalan, Spanish

**LECTURER**

Coordinating lecturer: José Ignacio Iribarren Laco

Others:
Primer quadrimestre:
- ELAINE APARECIDA ARMELIN DIGGROC - M11, M12
- GEORGINA FABREGAT JOVÉ - M11, M12
- JOSE IGNACIO IRIBARREN LACO - M11, M12

**DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES**

Specific:
1. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

**TEACHING METHODOLOGY**

Learning based in expositive lessons by using the resources available in Atenea campus and cooperative learning in practice sessions oriented to exercises resolution.

**LEARNING OBJECTIVES OF THE SUBJECT**

Apply the knowledge of mathematics and electrochemistry to study the corrosion. Design equipment and plants in chemical industry with efficiency and economic criteria.

**STUDY LOAD**

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>10,0</td>
<td>6.67</td>
</tr>
<tr>
<td>Hours large group</td>
<td>50,0</td>
<td>33.33</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

**Total learning time:** 150 h
CONTENTS

Introduction. Chemical industry characteristics.

Description:
General characteristics of chemical industry. Equipment and general installations. Associated problematic to the chemical plant.

Specific objectives:
Knowledge of the general characteristics of a chemical industry.

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

Thermodynamic basis of the corrosion.

Description:

Specific objectives:
To obtain the thermodynamic basis of corrosion and apply the Pourbaix diagrams to predict the possibility of corrosion.

Related activities:
Exercises session.

Full-or-part-time: 10h
Theory classes: 4h
Practical classes: 4h
Self study : 2h

Corrosion kinetics.

Description:

Specific objectives:
To obtain the kinetics implications in corrosion processes and apply to different factors affecting to corrosion rate.

Related activities:
Exercise session.

Full-or-part-time: 7h
Theory classes: 3h
Practical classes: 2h
Self study : 2h
### Types of corrosion. Protection against corrosion.

**Description:**
Environmental, water, soils and microbiological corrosion. Galvanic, homogeneous and located (pitting) corrosion. Stress corrosion cracking. Cathodic protection, metallic and plastic coatings.

**Applications to Chemical Industry.**

**Specific objectives:**
To distinguish the different types of corrosion related with the morphology and properties of metals and alloys.

**Related activities:**
Exercise session. Team work and visit to Galvanizados Tenas.

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

### Materials properties.

**Description:**

**Specific objectives:**
To study the main properties of materials which can be used in chemical industry.

**Related activities:**
Exercise session.

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

### Materials selection.

**Description:**
Materials selection criteria. Application to apparatus and equipment of chemical industry.

**Specific objectives:**
To establish the basis of materials selection criteria in chemical industry.

**Related activities:**
Exercise session.

**Full-or-part-time:** 6h
- Theory classes: 2h
- Practical classes: 2h
- Self study: 2h
**Costing and project evaluation.**

**Description:**

**Specific objectives:**
To study preliminarily the investment analysis and associated costing in chemical industry.

**Related activities:**
Exercise session.

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

**Mechanical design.**

**Description:**

**Specific objectives:**
To study the basis of mechanical design of vessels under pressure and storage tanks.

**Related activities:**
Exercise session.

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

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**GRADING SYSTEM**

Evaluation system includes:
- a) Exercises resolution in continuous evaluation (25% of final qualification)
- b) Laboratory sessions evaluation (10% of final qualification).
- c) Complementary activities like seminars, expositions and guided works (15% of final qualification).
- d) Final examination (50% of final qualification).

Reevaluation will replace the qualification of final examen, remaining unchanged the continuous evaluation.

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**EXAMINATION RULES.**

Additional material is allowed in examination in accordance with the criteria of the professor.

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**BIBLIOGRAPHY**

**Basic:**
Complementary: