240EI034 - Chemical Technology

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering
Academic year: 2017
Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Teaching unit Compulsory)
ECTS credits: 4,5
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Darbra Roman, Rosa Mari
Others: Bou Serra, Jordi
Cantó, Josep
Tarragó, Diana

Opening hours
Timetable: To be agreed with the professor

Requirements
No prerequisites

Degree competences to which the subject contributes
Specific:
CEMEI04. Ability for the analysis and design of chemical processes.

Teaching methodology
LECTURES
Description: Explain the contents of this subject.
Support material: Slides, exercises and papers. All the material is available on-line (atenea).
Description of the assignments due and their relation to the assessment: Continuous test. Mid-term exam. Final exam.
Specific objectives: To comply with those set in this subject.

Learning objectives of the subject
The specific objectives of this subject are:
1. Make the student aware of the diversity of products and industries related with the industrial chemistry.
2. Identify the raw materials and intermediate products used in the chemical production at large scale.
3. Understand the different physicochemical processes that allow the transformation of these raw materials to a final product.
4. Describe relevant processes for the chemical industry.
5. Value the importance of maintenance and other related services for the proper functioning of the chemical plants.
# Study load

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group: 27h 24.00%</th>
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<tbody>
<tr>
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<td>Hours small group: 13h 30m 12.00%</td>
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<td>Guided activities: 0h 0.00%</td>
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<td>Self study: 72h 64.00%</td>
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## Content

### Chapter 1. Introduction

**Learning time:** 3h 30m  
- Theory classes: 2h  
- Self study: 1h 30m

**Description:**  
Chemical industry importance at Spanish level and at a global scale. Concept of Unit Operation. Definition of chemical process and the important factors for its success: continuous and discontinuous processes, flow diagram, PID. Storage and transport. Main natural sources of raw materials for the chemical industry: lithosphere, hydrosphere, atmosphere and biosphere.

**Related activities:**  
- Lectures (2h)  
- 1 paper to read at home

**Specific objectives:**  
- Objectives: 1, 2.

### Chapter 2. Maintenance and auxiliary services

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

**Description:**  
Maintenance importance for the chemical industry. Maintenance types and function. Introduction to other practical aspects of the industry (subcontracting, communication, management, etc.). Auxiliary services: steam, vacuum, compressed air, nitrogen, etc.

**Related activities:**  
- Lectures (2h)

**Specific objectives:**  
- Objective: 5.

### Chapter 3. Distillation

**Learning time:** 19h  
- Theory classes: 7h  
- Self study: 12h

**Description:**  

**Related activities:**  
- Lectures (7h)  
- Practical exercises

**Specific objectives:**  
- Objective: 3.
# Chapter 4. Petroleum and Petrochemical Industry

**Learning time:** 17h
- Theory classes: 8h
- Self study: 9h

**Description:**

**Related activities:**
- Lectures (6h)
- Practical exercises
- 2 papers to read at home

**Specific objectives:**
- Objectives: 2, 3 and 4.

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# Chapter 5. Kinetics and reactors

**Learning time:** 24h
- Theory classes: 8h
- Self study: 16h

**Description:**

**Related activities:**
- Lectures (8h)
- Practical exercises

**Specific objectives:**
- Objective: 3

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# Chapter 6. Polymer and Plastics Industry

**Learning time:** 8h
- Theory classes: 3h
- Self study: 5h

**Description:**

**Related activities:**
- Lectures (3h)

**Specific objectives:**
- Objectives: 3 and 4
# Chapter 7. Membrane technology

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<td>Related activities:</td>
<td>Lectures (6h) Practical exercises</td>
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<td>Specific objectives:</td>
<td>Objective: 3</td>
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### Learning time:
- Theory classes: 6h
- Self study: 10h

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# Chapter 8. Chlor-Alkali industry

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<tr>
<td>Related activities:</td>
<td>Lectures (2h) 1 paper to read at home</td>
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<tr>
<td>Specific objectives:</td>
<td>Objectives: 2, 3 and 4</td>
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### Learning time:
- Theory classes: 2h
- Self study: 4h

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# Chapter 9. Other industries

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<td>Lectures (5h) Practical exercises</td>
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<tr>
<td>Specific objectives:</td>
<td>Objectives: 2, 3 and 4</td>
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### Learning time:
- Theory classes: 7h
- Self study: 8h
Qualification system

Continuous evaluation tests (PAC): 15% of the final qualification
Mid-term exam (EP): 25% of the final qualification
Final exam (EF): 60% of the final qualification
Final qualification (NF): NF = 0.15*PAC + 0.25*EP + 0.6*EF

Regulations for carrying out activities

The mid-term exam does not eliminate material and does not recover with the final exam. The reevaluation exam will only substitute the qualification obtained in the final exam for those students who have made, who not submitted to final exam does not have possibility of re-evaluation. The continuous test and mid-term exam are not reevaluated.

Bibliography

Basic:


Complementary: