Course guide
820528 - OBA2 - Unit Operations II

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). (Compulsory subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: Catalán

LECTURER
Coordinating lecturer: ORIOL GIBERT AGULLO
Others: Primer quadrimestre:
        FRANCISCO ESTRANY CODA - Grup: T1
        ORIOL GIBERT AGULLO - Grup: T1

PRIOR SKILLS
Find relevant information in the field of chemical engineering and correct oral and written expression, interpret graphs and diagrams, knowledge of transmission of heat and physicochemical

REQUIREMENTS
OPERACIONS BÀSIQUES I - Prerequisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES
Specific:
1. Understand mass and energy balances, biotechnology, mass transfer, separation operations, chemical reaction engineering, the design of reactors, and the recovery and processing of raw materials and energy resources.

Transversal:
2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT
To Acquire the necessary theoretical knowledge for the calculation and design industrial plants both mass transfer and simultaneous transfer of heat and matter, such as distillation, rectification continuous and discontinuous, solids drying, gas absorption, liquid-liquid extraction, etc..

To acquire analytical skills and ability to use information sources to solve exercises and problems of all these processes and facilities
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>60,0</td>
<td>40.00</td>
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Total learning time: 150 h

CONTENTS

1. Introduction to the operations with mass transfer

Description:
Introduction to the operations with mass transfer. Diffusion. Film and double-film theories. Mass transfer coefficient.

Full-or-part-time: 2h
Theory classes: 2h

2. Distillation

Description:

Full-or-part-time: 10h
Theory classes: 10h

3. Air-water interaction

Description:
Humidity, dew point, humid temperature and adiabatic saturation temperature, enthalpy of air-water systems. Psychrometric diagram. Humidification, cooling, etc.

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

4. Cooling towers

Description:
Industrial cooling circuits: open, closed and half open. Differential characteristics between them. Cooling towers: problematic and their specific characteristics.

Full-or-part-time: 4h
Theory classes: 4h
### 6. Absorption

**Description:**

**Full-or-part-time:** 8h  
Theory classes: 8h

### 7. Liquid-liquid extraction

**Description:**
Liquid-liquid extraction of binary mixtures in one stage of equilibrium and in various stages of equilibrium. Specific diagrams. Mass balance and design equations.

**Full-or-part-time:** 8h  
Theory classes: 8h

### 9. Adsorption

**Description:**

**Full-or-part-time:** 8h  
Theory classes: 8h

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**GRADING SYSTEM**

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**BIBLIOGRAPHY**

**Basic:**

**Complementary:**