Course guide
330152 - ETFTC - Fluid Transport Engineering and Heat Transmission

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.
Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Compulsory subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan

LECTURER
Coordinating lecturer: ANNA BONSFILLS PEDRÓS
Others: XAVIER GAMISANS NOGUERA

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Know the engineering of the transport of incompressible and compressible fluids. Formulate and apply fluidization. Calculate design heat exchange equipment. Use balances of matter and energy in basic operations. Solve problems and apply them theoretical knowledge in practice. Develop the capacity for analysis and synthesis.

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.
3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
4. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

TEACHING METHODOLOGY
The subject consists of four hours of class a week, which are dedicated to explaining the theoretical foundations and solving problems.

LEARNING OBJECTIVES OF THE SUBJECT
At the end of the course the student must be able to:
- Know the engineering of the transport of incompressible and compressible fluids.
- Formulate and apply fluidization.
- Calculate and design heat exchange equipment.
- Use mass and energy balances in basic operations.
- Solve problems and apply theoretical knowledge to practice.
- Develop the capacity for analysis and synthesis.
- Efficient oral and written communication.
- Work efficiently as a team.
- Learn autonomously.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

1. TRANSPORTATION OF FLUIDS

Description:
- Incompressible fluids.
- Compressible fluids.
- Fluidization.

Related activities:
- Theoretical classes.
- Posing and solving problems in class.
- Study and autonomous work of the student.
- Individualized monitoring of the student and evaluation.
- Activities 1, 2, 3.

Full-or-part-time: 75h
Theory classes: 15h
Practical classes: 15h
Self study : 45h

2. HEAT EXCHANGERS

Description:
- Classification of heat exchangers.
- Application of heat transmission mechanisms to heat exchangers.
- Calculation of concentric tube heat exchangers.
- General calculation of heat exchangers. Factor F method and E-NTU method.

Related activities:
- Theoretical classes.
- Posing and solving problems in class.
- Study and autonomous work of the student.
- Individualized monitoring of the student and evaluation.
- Activities 1,2,3.

Full-or-part-time: 75h
Theory classes: 15h
Practical classes: 15h
Self study : 45h
ACTIVITIES

ACTIVITY 1: AUTONOMOUS PROBLEM RESOLUTION

Description:
The student will be proposed a series of problems that must be solved individually and delivered.

Specific objectives:
- Monitor learning in the transport of incompressible and compressible fluids, with application to fluidization, as well as in heat exchangers.
- Solve problems and apply theoretical knowledge to practice.
- Develop the capacity for analysis and synthesis.

Material:
Atenea Campus.

Delivery:
25% of the final grade.

Full-or-part-time: 40h
Self study: 40h

ACTIVITY 2: WRITTEN TESTS

Description:
There will be two individual written tests.

Specific objectives:
Know the student's learning individually.

Material:
Atenea Campus.

Delivery:
60% of the final grade.

Full-or-part-time: 46h
Practical classes: 6h
Self study: 40h

ACTIVITY 3: ORAL PRESENTATION

Description:
Oral presentation of an industrial calculation problem and its resolution, where the assimilation of the contents taught in the subject is demonstrated, with subsequent questioning by the rest of the student body.

Specific objectives:
- Solve problems and apply theoretical knowledge to practice.
- Develop the capacity for analysis and synthesis.

Material:
Atenea Campus.

Delivery:
15% of the final grade.

Full-or-part-time: 12h
Practical classes: 2h
Self study: 10h
GRADING SYSTEM

Final mark = 60% individual written tests + 25% autonomous problem solving activities + 15% oral presentation and participation.

EXAMINATION RULES.

The activities are part of the continuous evaluation. If the student does not carry out any of the activities, it will be considered not scored.

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Other resources: