29942 - Fluid Facilities Design

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	435 - Bachelor's Degree in Chemical Engineering
ECTS	6.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The teaching and learning activities of this course are organised in several levels: lectures, case studies and assignments. The student gets progressively more involved as the course progresses.

During the lectures, the theoretical foundations of the course are presented and some sample problems are solved in

detail.

The case-study classes are the perfect supplement for the lectures because they allow the students to fully understand the subject. At the same time, the case studies develop an engineering way of thinking. These classes are organised in smaller groups where the student solves the suggested cases.

The assignments are small scale projects, more complex than the case studies. They are solved in groups outside the class.

5.2.Learning tasks

- **Lectures** (30 h): the theory will be explained here.
- **Tutorials** (20 h): in these sessions, the students will solve some case studies under the supervision of the lecturer. The cases will be closely related to the theory reviewed in the lectures.
- **Lab exercises** (10 h): the student will see either lab or computer demonstrations of the topics studied in the lectures.
- **Assignments** (30 h outside the class): There will be several small projects to be addressed by the students in groups.
- **Individual study time** (57 h outside the class): it is advisable the student carries out this study along the term.
- **Exam** (3 h).

5.3.Syllabus

1. Multiphase flow. Transport and separation of particles.
2. Flow, temperature, pressure and level instrumentation.
3. Piping engineering. Materials. Fittings. MTO. Codes.
4. 2D and 3D drawing.
5. Piping design.
6. Pipe stress and flexibility analysis.
7. Inspections. Tests. Installation and Commissioning.

5.4.Course planning and calendar

The timetable for lectures and tutorials will be prepared by the School.

The following table shows the tentative distribution of workload among the different teaching and learning activities.

Module	Classroom		Supervised exercises	Clinical tutorials	Personal work
	Lectures	Cases			
Multiphase	5	2			10

flow. Transport and separation of particles.					
Flow, temperature, pressure and level instrumentation.	5	2			10
Piping engineering. Materials. Fittings. MTO. Codes.2D and 3D drawing.	7	5	8	2	10
Piping design.	6	5	6	2	10
Pipe stress and flexibility analysis.	6	4	10	2	15
Inspections. Tests. Installation and Commissioning.	1	2			5
TOTAL	30	20	24	6	60

5.5.Bibliography and recommended resources

BB	Bausbacher, Ed. Process plant layout and piping design / Ed Bausbacher, Roger Hunt Upper Sadle River, New Jersey : Prentice Hall, cop. 199
BB	Benedict, Robert P.. Fundamentals of pipe flow / Robert P. Benedict New York [etc.] : John Wiley & Sons, cop. 1980
BB	Creus Solé, Antonio. Instrumentación industrial / Antonio Creus Solé . 8ª ed. Barcelona : Marcombo, 2011
BB	Fitzgerald, Bill. Control valves for the

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	chemical process industries / Bill Fitzgerald New York [etc.] ; McGraw-Hill, cop. 1995
BB	Flujo de fluidos en válvulas, accesorios y tuberías / preparado por la división de Ingeniería de CRANE ; traducción, VALFISA ; revisión técnica, Clemente Reza García México [etc.] : McGraw-Hill, imp. 1987
BB	García Gutierrez, Luis. Válvulas de control / Luis García Gutierrez Madrid : AENOR, D.L. 1999
BB	Martín Hernández, Bernardo. Manual de tuberías / Bernardo Martín Fernández Bilbao : El Autor, D.L.1994
BB	Mateos de Vicente, Manuel. Válvulas de retención y otras válvulas afines / por Manuel Mateos de Vicente . - 2ª ed. amp. y en color Madrid : Bellisco, 2008
BB	Mendiluce Rosich, Enrique. El golpe de ariete en impulsiones / Enrique Mendiluce Rosich . - 2ª ed. revisada y actualizada Madrid : Librería Editorial Bellisco, 1987
BB	Ollero de Castro, Pedro. Control e instrumentación de procesos químicos / Pedro Ollero de Castro, Eduardo Fernández Camacho Madrid : Síntesis, D. L. 1997
BB	Parmakian, John. Waterhammer analysis / John Waterhammer New York [etc.]: Dover Publications, 1963
BB	Piping design handbook / edited by John J. McKetta New York : Marcel Dekker, cop. 1992
BB	Rase, Howard F.. Diseño de tuberías para plantas de proceso / Howard F. Rase ; versión española Juan Pérez Peces . - [1a. ed. española, 1a. reimp.] Madrid : Blume, 1979
BB	Sandler, Henry J.. Practical process engineering : a working approach to plant design / Henry J. Sandler, Edward T. Luckiewicz New York [etc.] : McGraw-Hill, cop. 1987
BB	Soares, Claire. Process engineering equipment handbook / Claire Soares New York [etc.] : McGraw-Hill, cop. 2002
BB	The Chemical engineering guide to valves / edited by Richard W. Greene and the Staff of Chemical Engineering New York : McGraw-Hill : Chemical Engineering, 1984
BB	Wylie, E. Benjamin. Fluid transients in systems / by E. Benjamin Wylie and Victor L. Streeter ; with Lisheng Suo Englewood Cliffs, NJ : Prentice Hall, cop.1993