

Course guides

340041 - MFLU-F3P29 - Fluid Mechanics

Last modified: 09/09/2015

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 729 - MF - Department of Fluid Mechanics.

Degree: **Academic year:** 2015 **ECTS Credits:** 6.0
Languages: Catalan

LECTURER

Coordinating lecturer: Montserrat Carbonell Ventura

Others: Jordi Pons Segalas

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. CE8. Knowledge of basic principals of fluid mechanic and its application to resolve problems in engineering area. Calculus of channels, canals and fluids.

Transversal:

07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

05 TEQ N2. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

TEACHING METHODOLOGY

- Lectures and participatory classes, consisting of explanation and development of the theory and, if necessary in the resolution of problems. The material user will be available to the student in the Digital Campus section of the subject.
- Practical lessons in problem-solving, where it will seek the maximum involvement of students through their direct involvement in solving the problems. Students must solve in class / outside of class, individually or in groups, problems that are assigned. In the Digital Campus section of the subject, the student can look up the list of problems before they are done in class.
- Hand in resolved problems by students. Submittals will consist on individual or group solution, in class or outside class, of some problems of the list or similar, the student will have in the Digital Campus. This activity will be evaluated. The student feed-back can made from the submission of the revised problems.
- Laboratory practical classes, made directly by students, guided by the teacher, allowing them to directly observe relevant aspects of the theory. The student can look up the explanatory text of the practices to develop in the Digital Campus. The students will give the theacher a copy of the experimental extracted data. Later, students must make a report of the practices carried out. This report will be evaluated and will be delivered before the date set by the theacher.
- Tutorial classes in group or individual.
- Students will make two exams of all theoretical and practical knowledge developed in the subject.

LEARNING OBJECTIVES OF THE SUBJECT

When the student finishes the subject, he/she has to be capable of:

- Understanding the basic principles of the behavior of fluids, when static and in movement, as well as the principles of applied thermodynamics and heat transfer.
- Knowing the basic principles of turbomachinery.
- Knowing the principles of fluid mechanics in energy transmission systems.
- Solving problems of pipelines and simple fluid systems.
- Knowing the principles of thermal equipment and generators.
- Analyzing and solving problems in the area of thermal and fluid engineering.
- Interpreting, analyzing, synthesizing and extracting conclusions of results of measurements and tests.
- Writing texts with the structure adapted to the aims of communication.
- Knowing and putting into practice the dynamics teamwork.
- Carrying out assignments from basic directions given by the teacher.

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	52,5	35.00
Hours small group	7,5	5.00

Total learning time: 150 h

CONTENTS

1. INTRODUCTION TO FLUID MECHANICS. FLUID PROPERTIES.

Description:

content english

Full-or-part-time: 18h 45m

Theory classes: 6h

Laboratory classes: 11h 15m

Self study : 1h 30m

2. FLUIDS STATICS

Description:

content english

Full-or-part-time: 20h

Theory classes: 8h

Self study : 12h

3. BASIC CONCEPTS FOR FLOW ANALYSIS

Description:

content english

Specific objectives:

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Full-or-part-time: 10h

Theory classes: 4h

Self study : 6h

4. BASIC LAWS OF FLUID MECHANICS AND THEIR APPLICATIONS (I)

Description:

content english

Full-or-part-time: 32h 30m

Theory classes: 11h

Laboratory classes: 2h

Self study : 19h 30m

title english

Description:

content english

Full-or-part-time: 25h

Theory classes: 10h

Self study : 15h

6. FLOW SYSTEM ANALYSIS

Description:

content english

Full-or-part-time: 17h 30m

Theory classes: 5h 30m

Laboratory classes: 1h 30m

Self study : 10h 30m

TEMA 7: FUNDAMENTAL PNEUMATIC PRINCIPLES

Description:

content english

Full-or-part-time: 26h 15m

Theory classes: 8h

Laboratory classes: 2h 30m

Self study : 15h 45m



GRADING SYSTEM

The different concepts that make up the continuous assessment are:

- Written individual examinations (70%)
- Laboratory practical and reports (10%)
- Submission of resolved problems (20%)

BIBLIOGRAPHY

Basic:

- Çengel, Yunus A.; Cimbala, John M. Mecánica de fluidos : fundamentos y aplicaciones. 2a ed. México: McGraw-Hill, 2012. ISBN 9786071507792.
- Heras, Salvador de las. Mecánica de fluidos en ingeniería [on line]. Barcelona: Iniciativa Digital Politècnica, 2012 [Consultation: 22/09/2014]. Available on: <http://hdl.handle.net/2099.3/36608>. ISBN 9788476539354.
- White, Frank M. Mecánica de fluidos. 6a ed. Madrid [etc.]: McGraw-Hill, 2008. ISBN 9788448166038.
- Agüera Soriano, José. Mecánica de fluidos incompresibles y turbomáquinas hidráulicas. 5a ed. Madrid: Ciencia 3, 2002. ISBN 8495391015.

Complementary:

- Bergadà Granyó, Josep Maria. Mecánica de fluidos : breve introducción teórica con problemas resueltos [on line]. 2a ed. Barcelona: Iniciativa Digital Politècnica, 2015 [Consultation: 22/09/2014]. Available on: <http://hdl.handle.net/2099.3/36611>. ISBN 9788498805253.
- Franzini, Joseph B.; Finnemore, E. John. Mecánica de fluidos con aplicaciones en ingeniería. 9a ed. Madrid [etc.]: McGraw-Hill, 1999. ISBN 844812474X.
- Potter, Merle C. [et al.]. Mecánica de fluidos. 3a ed. México [etc.]: Prentice Hall, 2001. ISBN 9706862056.