

## 300211 - MF - Fluid Mechanics

Coordinating unit:	300 - EETAC - Castelldefels School of Telecommunications and Aerospace Engineering		
Teaching unit:	748 - FIS - Department of Physics		
Academic year:	2018		
Degree:	BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERING (Syllabus 2015). (Teaching unit Compulsory) BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERINGS/BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING - NETWORK ENGINEERING (AGRUPACIÓ DE SIMULTANEÏTAT) (Syllabus 2015). (Teaching unit Compulsory) BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERING/BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING (Syllabus 2015). (Teaching unit Compulsory) BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERING/BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2015). (Teaching unit Compulsory)		
ECTS credits:	7,5	Teaching languages:	Catalan, Spanish, English

### Teaching staff

Coordinator:	Definit a la infoweb de l'assignatura.
Others:	Definit a la infoweb de l'assignatura.

### Opening hours

Timetable:	x
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### Prior skills

X

### Requirements

X

### Degree competences to which the subject contributes

#### Specific:

1. CE 16 AERO. Conocimiento adecuado y aplicado a la Ingeniería de: Los conceptos y las leyes que gobiernan los procesos de transferencia de energía, el movimiento de los fluidos, los mecanismos de transmisión de calor y el cambio de materia y su papel en el análisis de los principales sistemas de propulsión aeroespaciales. (CIN/308/2009, BOE 18.2.2009)
2. CE 18 AERO. Conocimiento adecuado y aplicado a la Ingeniería de: Los fundamentos de la mecánica de fluidos; los principios básicos del control y la automatización del vuelo; las principales características y propiedades físicas y mecánicas de los materiales. (CIN/308/2009, BOE 18.2.2009)
3. CE 19 AERO. Conocimiento aplicado de: la ciencia y tecnología de los materiales; mecánica y termodinámica; mecánica de fluidos; aerodinámica y mecánica del vuelo; sistemas de navegación y circulación aérea; tecnología aeroespacial; teoría de estructuras; transporte aéreo; economía y producción; proyectos; impacto ambiental. (CIN/308/2009, BOE 18.2.2009)

#### Transversal:

4. 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.
5. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral

## 300211 - MF - Fluid Mechanics

presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

6. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

### Teaching methodology

X

### Learning objectives of the subject

X

### Study load

Total learning time: 187h 30m	Hours large group:	48h	25.60%
	Guided activities:	34h 30m	18.40%
	Self study:	105h	56.00%

## 300211 - MF - Fluid Mechanics

### Content

<p>INTRODUCTION TO FLUID MECHANICS</p>	<p>Learning time: 18h 30m Theory classes: 6h 30m Guided activities: 4h Self study : 8h</p>
<p>Description: x</p> <p>Related activities: x</p>	
<p>FLUID KINEMATICS</p>	<p>Learning time: 23h 30m Theory classes: 6h 30m Guided activities: 5h Self study : 12h</p>
<p>Description: x</p> <p>Related activities: x</p>	
<p>FLUID DYNAMICS: EQUATIONS IN INTEGRAL FORM</p>	<p>Learning time: 28h 30m Theory classes: 8h Guided activities: 5h 30m Self study : 15h</p>
<p>Description: X</p> <p>Related activities: X</p>	
<p>FLUID DYNAMICS: EQUATIONS IN DIFFERENTIAL FORM</p>	<p>Learning time: 40h 30m Theory classes: 11h Guided activities: 5h 30m Self study : 24h</p>
<p>Description: x</p> <p>Related activities: x</p>	



## 300211 - MF - Fluid Mechanics

INCOMPRESSIBLE, INVISCID FLOWS	Learning time: 30h 30m Theory classes: 4h 30m Guided activities: 5h Self study : 21h
Description: x Related activities: x	
COMPRESSIBLE, INVISCID FLOWS	Learning time: 46h Theory classes: 11h 30m Guided activities: 9h 30m Self study : 25h
Description: x Related activities: x	

## 300211 - MF - Fluid Mechanics

### Planning of activities

AV1: PROBLEM TEST	Hours: 5h Guided activities: 1h Self study: 4h
AV2: PROJECT TEST	Hours: 2h 30m Guided activities: 0h 30m Self study: 2h
AV3: SUPERVISED ACTIVITIES OF PROBLEM SOLVING	Hours: 84h Guided activities: 28h Self study: 56h
AV4: PROJECT ABOUT NUMERICAL SOLUTION OF PROBLEMS IN FLUID MECHANICS	Hours: 28h 30m Theory classes: 1h Guided activities: 1h 30m Self study: 26h
AV5: MID-TERM EXAM	Hours: 8h 30m Self study: 7h Guided activities: 1h 30m
AV6: FINAL EXAM	Hours: 12h Self study: 10h Guided activities: 2h

### Qualification system

X

### Regulations for carrying out activities

X

## 300211 - MF - Fluid Mechanics

### Bibliography

#### Basic:

Anderson, John David. Fundamentals of aerodynamics. 3rd ed. Boston [etc.]: McGraw-Hill, 2001. ISBN 0072373350.

White, Frank M. Mecánica de fluidos. 6<sup>a</sup> ed. Madrid [etc.]: McGraw-Hill, 2008. ISBN 9788448166038.

#### Complementary:

Batchelor, G.K. An introduction to fluid dynamics. Cambridge: Cambridge University Press, 2000. ISBN 0521663962.

Anderson, John David. Introduction to flight. 6th ed. Boston [etc.]: McGraw-Hill, 2008. ISBN 9780073529394.

Anderson, John David. Computational fluid dynamics. New York [etc.]: McGraw-Hill, 1995. ISBN 0070016852.