

Course Syllabus

Aerospace Technology

Year: 2018/2019

Code: 9966001207

Coordinating professor: Rubén Dapica Tejada

Degree program: Degree in Aerospace Engineering of aircrafts

School: Arquitectura, Ingeniería y Diseño

Languages: English

The mission of Universidad Europea de Madrid is to offer its students a holistic education, helping them become leaders and professionals capable of responding effectively to the needs of today's global world, adding value within their career fields, and contributing to social advancement through their entrepreneurial spirit and ethical integrity. We also strive to create and transfer knowledge through applied research, thus making our own contribution to progress and putting ourselves at the forefront of intellectual, scientific, and technological development.

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1. Basic information on the course/module

ECTS	6
Credit type	Degree requirements
Language	English
Delivery mode	Face to face
Trimester/Semester	Second semester

2. Presentation of the course/module

This course belongs to the “Aerospace systems and infrastructures” module:

- Aerospace Technology 6 ECTS (first year)
- Navigation Systems I 6 ECTS (first year)
- Navigation Systems II 6 ECTS (second year)
- Air Transport 6 ECTS (second year)

The course includes the topics of basic aerodynamics, atmosphere, propulsion, structures, aircraft systems, space systems. It is intended to present a first introduction to most of subsystems of aerospace vehicles.

3. Competencies and learning outcomes

Core competencies:

- CB1: That students have demonstrated knowledge and understanding in a field of study that part of the basis of general secondary education, and is usually found at a level that, while supported by advanced textbooks, includes some aspects that will knowledge of the forefront of their field of study

Cross-curricular competencies:

- CT6: Ability to participate in test flights to take measurements of take-off distance, lift velocity, stall velocity, manoeuvrability, and landing performances.
- CT10: To know aeronautics engineering history, analyze and assess the different elements and activities involved in aeronautical sector

Specific competencies:

- CE10: To understand how aerodynamics forces determine flight dynamics, and the influence of variables involved in flight phenomena
- CE13: To understand the uniqueness of infrastructure, building and operation of airports.
- CE18: Appropriate knowledge applied to engineering of: basics of fluid mechanics; basic principles of flight control and automatization; main characteristics and physical and mechanical properties of materials.
- CE19: Applied knowledge of: the science and technology of materials, mechanics and thermodynamics, fluid mechanics, aerodynamics and flight mechanics, navigation and air traffic, aerospace technology, theory of structures, air transport, economy and production projects; impact on environment.

Notes: UNIQUE LEVEL: Competence developed at one level. Level 1 (N1): awareness about the importance of competences and basic application of it to several situations. Level 2(N2): interiorization and skillful handling of competences. Level 3 (N3): Full interiorization and handling of competences at any needed situation.

Learning outcomes:

- LO20: To conduct studies by integrating the technologies and engineering procedures which are developed in the competencies of this modules

- LO21: From a series of requirements, and prior information, to conceptualize an engineering problem, proposes an approach to solve it, and obtain the better solution.

All this related to the competencies of this module

The table below shows the relation between the competencies developed during the course and the envisaged learning outcomes:

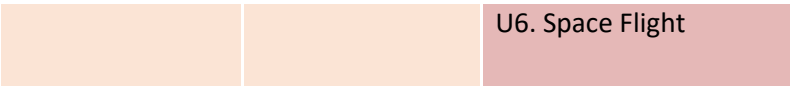
Competencies	Learning outcomes
CB1, CT10, CE10, CE13, CE18, CE19	LO20
CT6, CE10, CE18, CE19	LO21

The following table shows how the different types of activities are distributed and how many hours are assigned to each type:

Type of educational activity	Number of hours
Lecture-based class	20 h
Integration of team work	60 h
Self-study	50 h
Mentoring, academic monitoring and assessment	20 h
TOTAL	150 h

To develop the competencies and achieve the learning outcomes, you will have to complete the activities indicated in the table below:

Learning outcomes	Learning activity	Type of activity	Content
LO20: To conduct studies by integrating the technologies and engineering procedures which are developed in the competencies of this modules	Activity 1	Self-study	U2. Basic Aerodynamics U4. Elements of Mechanics of Flight
	Activity 2	Integration of team work	U1. Foundations of Aerospace Technology U2. Basic Aerodynamics U4. Elements of Mechanics of Flight
LO21: From a series of requirements, and prior information, to conceptualize an engineering problem, proposes an approach to solve it, and obtain the better solution. All this related to the competencies of this module	Activity 3	Self-study	U1. Foundations of Aerospace Technology
	Activity 4	Integration of team work	U2. Basic Aerodynamics
	Activity 5	Self-study	
	Activity 6	Mentoring, academic monitoring and assessment	U3. Propulsion
	Activity 7	Mentoring, academic monitoring and assessment	U4. Elements of Mechanics of Flight U5. Introduction to Air Navigation and Airports



U6. Space Flight

When you access the course on the *Virtual Campus*, you'll find a description of the activities you have to complete, as well as the deadline and assessment procedure for each one.

4. Monitoring and assessment

The following table shows the assessable activities, their respective assessment criteria, and the weight each activity carries towards the final course grade.

Assessable activity	Assessment criteria	Weight (%)
Activity 1	<ul style="list-style-type: none"> Inputs are set up correctly The results are analyzed and interpreted properly Conclusions are drawn to improve the design The format and writing in the report is adequate 	15%
Activity 2	<ul style="list-style-type: none"> Appropriate hypothesis have been considered. Correct results are obtained for several cases and interpreted properly Results are analyzed and conclusions extracted to improve the design. 	20%
Activity 3	<ul style="list-style-type: none"> Appropriate hypothesis have been considered. The complete set of equations to solve the problem has been expound Correct results are obtained according to the hypothesis considered. The results are analyzed and conclusions are outlined. 	10%
Activity 4	<ul style="list-style-type: none"> Appropriate assumptions are taken The complete set of equations to solve the problem has been expound Correct results are obtained according to the hypothesis considered. The results are analyzed and conclusions are outlined. Students cooperate to accomplish previous criteria. 	5%
Activity 5	<ul style="list-style-type: none"> The concepts of the subject are perfectly understood Typical misleading prior knowledge is overcome New knowledge is applied correctly 	5%
Activity 6	<ul style="list-style-type: none"> Appropriate assumptions are taken The necessary set of equations to solve the problem has been identified Correct results are obtained according to the hypothesis considered The results are analyzed and conclusions are outlined. 	35%

Activity 7	<ul style="list-style-type: none"> • Explanation is clear and concise • The format and content of the report and the presentation is adequate • Presentation time is adjusted to the required time limit • Student can argue the answers to the questions 	10%
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When you access the course on the *Campus Virtual*, you'll find a description of the activities you have to complete, as well as the deadline and assessment procedure for each one.

4.1. First exam period

To pass the course in the first exam period you should

- Obtain a minimum mark of 5 over 10 in every evaluation method:
 - 1. Exam,
 - 2. Project and simulation practice
 - 3. Simulation practice,
 - 4. Problem solving and transversal-disciplinary skills.
- A class attendance of 50% is required.

4.2. Second exam period

To pass the course in the second exam period you should

- Obtain a minimum mark of 5 over 10 in every evaluation method:
 - 1. Exam,
 - 2. Project and simulation practice,
 - 3. Problem solving and transversal-disciplinary skills.

5. Bibliography

Here is the recommended bibliography:

- Anderson, J.D. *Introduction to Flight, 18th Edition*. McGraw-Hill, 2016.
- Franchini, S. & López García, O. *Introducción a la ingeniería aeroespacial. 2ª edición*. Garceta, 2012.

6. How to communicate with your professor

Whenever you have a question about the content or activities, don't forget to post it to your course forum so that your classmates can read it.

You might not be the only one with the same question!

If you have a question that you only want to ask your professor, you can send him/her a private message from the *Campus Virtual*. And if you need to discuss something in more detail, you can arrange an advisory session with your professor.

It's a good idea to check the course forum on a regular basis and read the messages posted by your classmates and professors, as this can be another way to learn.

7. Study recommendations

When you study at university, you need to plan and be consistent from the first week. It's very useful to exchange experiences and opinions with professors and other students, as this will help you develop core competencies such as flexibility, negotiating skills, teamwork, and, of course, critical thinking.

To help you, we recommend using a general method of study based on the following points:

- Study systematically and at a steady pace.
- Attend class and regularly check the course forum on the *Campus Virtual* so that you keep up to date with what's happening.
- Participate actively in the course by sharing your opinions, doubts and experiences relating to the topics covered and/or suggesting new topics of interest for discussion.
- Read the messages posted by your classmates and/or professors.

Active participation in physical and virtual classroom activities is of special interest and academic value. You can participate in many different ways: asking questions, giving your opinion, doing all the activities your professor suggests, taking part in collaborative activities, helping your classmates, etc. This way of working requires effort, but it will help you get better results as you develop your competencies.