Course guide
220011 - EST - Statistics

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 715 - EIO - Department of Statistics and Operations Research.
Degree: BACHELOR’S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).
BACHELOR’S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Compulsory subject).
Academic year: 2022
ECTS Credits: 6.0
Languages: Catalan

LECTURER
Coordinating lecturer: MARIA ALBAREDA SAMBOLA
Others: INES M. ALGABA JOAQUIN - SALVADOR CASADESUS PURSALS - ALEJANDRO JURADO LEYDA
- MARTA JANIRA CASTELLANO PALOMINO - DANIEL FERNANDEZ MARTINEZ

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE1. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Generical:
CG8T. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.

TEACHING METHODOLOGY
In order to motivate the student, in the beginning of each topic an introduction about the problem faced would be developed, insisting on the tools and methodologies.
The subject development could be made by the lecture of a recommended text and doing all of the development made in the blackboard. In order to understand difficult concepts multimedia material developed by the teachers will be used. It is going to be found in Atenea in PDF format.
The students have access to a solved collection of problems. Every week the next week exercises are fixed in order to favor the participation. During theory lessons little examples will be implemented too.
At the end of each topic, a problems collection will be available in Atenea, destined to the self-evaluation.
Observation: Although the documentation is in Catalan this course might be taught in Spanish, if needed.

LEARNING OBJECTIVES OF THE SUBJECT
The objective of the subject is to train the future engineer to guarantee the quality levels of products and processes, select suppliers, compare results. Essentially, making decisions under random context.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>14,0</td>
<td>9.33</td>
</tr>
<tr>
<td>Hours large group</td>
<td>46,0</td>
<td>30.67</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>
Total learning time: 150 h

**CONTENTS**

1. Introduction.

**Description:**

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**Related activities:**

**Full-or-part-time:** 10h  
Theory classes: 1h  
Self study: 9h  

2. Patterns of probabilistic behavior.

**Description:**

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**Full-or-part-time:** 44h  
Theory classes: 15h  
Practical classes: 5h  
Self study: 24h  

3. Statistical sampling

**Description:**

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**Full-or-part-time:** 22h  
Theory classes: 6h  
Practical classes: 2h  
Self study: 14h  


**Description:**

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**Full-or-part-time:** 42h  
Theory classes: 12h  
Practical classes: 5h  
Self study: 25h
5. Lineal model.

Description:

Full-or-part-time: 19h
Theory classes: 6h
Practical classes: 1h
Self study: 12h

6. Reliability.

Description:

Full-or-part-time: 13h
Theory classes: 6h
Practical classes: 1h
Self study: 6h

ACTIVITIES

1. THEORY CLASSES

Related competencies:
08 CAS N2. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.
CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Full-or-part-time: 77h
Theory classes: 42h
Self study: 35h

2. PROBLEMS CLASSES

Related competencies:
08 CAS N2. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.
CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Full-or-part-time: 29h
Practical classes: 14h
Self study: 15h
3. SELF-ASSESSMENT

Related competencies:
08 CAS N2. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.
CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Full-or-part-time: 18h
Self study: 18h

4. DIRECTED ACTIVITY

Related competencies:
08 CAS N2. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.
CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Full-or-part-time: 9h
Self study: 9h

5. CONTINUOUS ASSESSMENT WITH QUESTIONNAIRES

Related competencies:
08 CAS N2. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.
CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Full-or-part-time: 2h
Self study: 2h

6. PARTIAL EXAM

Related competencies:
08 CAS N2. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.
CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Full-or-part-time: 7h
Theory classes: 1h 30m
Self study: 5h 30m
7. FINAL EXAM

Related competencies:
08 CAS N2. THE ABILITY TO ANALYSE AND SYNTHESISE: The ability to think abstractly about the fundamental concepts of a text or exposition and to intelligibly present the result of one's work.
CE01. The ability to solve mathematical problems that may arise in an engineering context. The ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics and optimisation

Full-or-part-time: 8h
Theory classes: 2h 30m
Self study: 5h 30m

GRADING SYSTEM

Continuous evaluation: weigh 10%
Second midterm exam: weigh 40%
Second midterm exam: weigh 40%
Practices: weigh 10%

Any student who cannot attend to the midterm exam (activity 6) or that wants to improve the obtained grade, will have the opportunity to improve that grade by taking an additional written exam that will take place the same day as the final exam (activity 7). The grade obtained in this test will range between 0 and 10, and will replace that of the midterm exam in case it is higher.

EXAMINATION RULES.

In case someone doesn't attend to an evaluation activity, this activity would be qualified as 0.

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Hyperlink:
- http://aprenestadistica.gencat.cat/secundaria/activitats/common/glossari_estadistic.jsp