1. BASIC INFORMATION

Course	Statistics
Degree program	Bachelor in Aerospace Engineering
School	Architecture, Engineering and Design
Year	Second
ECTS	6 ECTS
Credit type	Basic
Language(s)	English
Delivery mode	On-site
Semester	Second
Academic year	2025/2026
Professor	Dr. Manuel García Fernández, Dr. Guillermo Castilla.
Coordinating Professor	Dr. Manuel García Fernández

2. PRESENTATION

Statistics for Engineering is a 6 ECTS second-year mathematics course. Its overall objective is to equip students with knowledge and skills related to the concepts and basic problems of statistics and probability. The course is an introduction to statistical methods, mainly one-variable analysis, applied to the environment and scientific research in many fields of engineering. This subject is part of the Mathematics module, which consists of the following courses:

- Algebra
- Calculus I
- Calculus II
- Statistics

Students will be able to deal with statistical concepts including measures of central tendency and dispersion, probability distributions, confidence intervals and hypothesis testing, and to apply them to a wide range of situations. They will demonstrate basic mathematical understanding and computational skills, and they will be able to explain and critique mathematical reasoning through speaking and writing in a precise and articulate way.

3. SKILLS, COMPETENCES AND KNOWLEDGE

Knowledge:

CON 19. Identify the knowledge of basic subjects and technologies, enabling the student to learn new methods, theories and technologies, and endowed it with great versatility to adapt to new situations (autonomous learning).

Specific knowledge of the subject:

- Acquire knowledge of descriptive statistics.
- Identify the principles of statistical inference.
- Acquire knowledge of probability.

Skills:

HAB01 FB01. Ability to solve mathematical problems that may arise in engineering. Aptitude to apply knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods; numerical algorithms; statistics, and optimization. Specific skills of the subject:

- Solve problems in applied mathematics.
- Prepare structured and rigorous engineering reports (based on laboratory practices).
- Apply statistical knowledge to Satellite Design (Stochastic Systems).

Competencies:

CP12. Generate new ideas and concepts from known ideas and concepts, reaching conclusions or solving problems, challenges, and situations in an original way in the academic and professional environment.

CP13. Convey messages (ideas, concepts, feelings, arguments), both orally and in writing, strategically aligning the interests of the various parties involved in communication in the academic and professional environment in the field of aerospace engineering.

CP14. Employ information and communication technologies for data search and analysis, research, communication, and learning in the field of aerospace engineering.

CP15. Influence others to guide and lead them towards specific objectives and goals, taking into consideration their viewpoints, especially in professional situations arising from the volatile, uncertain, complex, and ambiguous (VUCA) environments of the current world.

CP16. Collaborate with others in achieving a shared academic or professional objective, actively participating, demonstrating empathy, and practicing active listening and respect for all team members.

CP17. Integrate analysis with critical thinking in an evaluation process of different ideas or professional possibilities and their potential for error, relying on evidence and objective data that lead to effective and valid decision-making.

CP18. Adapt to adverse, unexpected situations that cause stress, whether personal or professional, overcoming them and even turning them into opportunities for positive change.

CP19. Demonstrate ethical behavior and social commitment in the performance of professional activities, as well as sensitivity to inequality and diversity.

4. CONTENT

The course is divided in five learning units, as detailed in Annex:

- Unit 1. Descriptive Statistics
- Unit 2. Probability.
- Unit 3. Random variables and introduction to stochastic processes
- Unit 4. Probability models.
- Unit 5. Statistical inference.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Cooperative learning
- Problem Based Learning (PBL)
- Learning assignments (case studies)
- Master class (face-to-face sessions)

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours	IA USAGE
TEA1: Master classes (face-to-face sessions)	25	Allowed
TEA2: Group work (participation in debates and seminars, group activitiesand exercises)	55	Not Allowed
TEA3: Self-studying and autonomous work	50	Allowed
TEA4: Tutoring sessions, follow-up and assessments.	20	Allowed
TOTAL	**150**	

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight	Use of AI
Individual Assignments	15%	Not Allowed
Group Assignments	25%	Allowed & Evaluated
Midterm Exam	15%	Not Allowed
Field experiences, conferences and visits	10%	Allowed
Final Exam	35%	Not allowed

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

7.1. First exam period

To pass the course in the first exam period, you must:

- Attend at least 50% of the lectures, with the exception of some special cases included in the School regulations.
- Obtain a final course grade of at least 5 out of 10 (weighted average).
- Obtain a grade greater than or equal to 5.0 out of 10 in the final exam.
- Obtain a grade greater than or equal to 5.0 out of 10 in the group project.

In any case, you will need to obtain a grade of at least 5.0 in the final exam in order for it to count towards the final grade along with all the grades corresponding to the other activities.

7.2. Second exam period

Students who do not pass the course during the normal assessment period will have a second chance to retake the course in the Supplementary Exam Period. The same requirements and assessment rules mentioned in the previous section (regular assessment period) hold also in this period, with the exemption of the attendance requirement.

To pass the course in the second exam period, you must obtain a final grade of at least 5 out of 10 (weighted average).

In any case, you will need to obtain a grade of at least 5.0 in the final exam for it to count towards the final grade along with all the grades corresponding to the other activities.

The student must deliver the activities not successfully completed in the first exam period or those that were not delivered in the first place. They will carry out new activities of similar difficulty and length. These activities will be published in the Virtual Campus at the beginning of the Supplementary Exam Period.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
Lab session with Matlab/Python. Group Activity Unit 1	Week 3
Individual Activity Units 1 and 2.	Weeks 6-7
Individual Activity Unit 3	Weeks 9-11
Midterm exam	Weeks 8-9
Class Activity Unit 4	Weeks 11-12
Class Activity Unit 5	Week 14-15
Group Project: first hand in (presentation of data for validation)	Week 4
Group Project: report hand in	Week 15-16
Project group presentation	Week 15-17
Final exam	Week 16-17
Visit/conference	To determine

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9.   BIBLIOGRAPHY

The recommended Bibliography is:

- R. E. WALPOLE, R.H. MYERS, S.L. MYERS. *Essentials of probability & statistics for engineers & scientists*. PEARSON
- R. E. WALPOLE et al. *Probabilidad y Estadística*. México, McGraw-Hill.
- R. S. Witte, J.S. Witte. *Statistics*. WILEY

10.   EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.
 From this unit we offer to our students:
1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:
orientacioneducativa@universidadeuropea.es

11.   ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the "surveys" section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.

WORK PLAN FOR THE COURSE

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.

PLAGIARISM REGULATION

In accordance with the current student disciplinary regulations at Universidad Europea:

- Plagiarism, in full or in part, of intellectual works of any kind, is considered a very serious offense.
- Very serious offenses relating to plagiarism and the use of fraudulent means to pass assessment tests shall result in exclusion from the exams for the relevant period, as well as the inclusion of theoffense and its details in the student's academic record.

REGULATION USE OF AI

The student must be the author of his/her work/activities.

The use of Artificial Intelligence (AI) tools must be authorized by the teacher in each work/activity, indicating in what way its use is allowed. The teacher will previously inform in which situations AI tools may be used to improve spelling, grammar and editing in general. The student is responsible for clarifying the information given by the tool and duly declaring the use of any AI tool, according to the guidelines set by the teacher. The final decision on the authorship of the work and the appropriateness of the reported use of an AI tool rests with the teacher and the degree officers.