Universidad de Alcalá

TEACHING GUIDE

Statistics

Degree in
Electronic Communications Engineering (GIEC)
Telematics Engineering (GIT)
Telecommunication Systems Engineering (GIST)
Telecommunication Technologies Engineering (GITT)

Universidad de Alcalá

Academic Year 2023/2024

2nd Year - 1st Semester (GIEC+GIT+GIST+GITT)

Approved by the School Board on June 12th, 2023

TEACHING GUIDE

Course Name:	**Statistics**
Code:	**350012 (GIEC+GIT+GIST+GITT)**
Degree in:	**Electronic Communications Engineering (GIEC)** **Telematics Engineering (GIT)** **Telecommunication Systems Engineering (GIST)** **Telecommunication Technologies Engineering (GITT)**
Department and area:	**Física y Matemáticas** **Applied Mathematics**
Type:	**Basic (GIEC+GIT+GIST+GITT)**
ECTS Credits:	**6.0**
Year and semester:	**2nd Year - 1st Semester (GIEC+GIT+GIST+GITT)**
Teachers:	Por definir
Tutoring schedule:	Consultar al comienzo de la asignatura
Language:	English

1. COURSE SUMMARY

Presentation

2. SKILLS

Basic, Generic and Cross Curricular Skills.

This course contributes to acquire the following generic skills, which are defined in the Section 3 of the Annex to the Orden CIN/352/2009:

en_TR2 - Knowledge of basic subjects and technologies that enables to learn new methods and technologies, as well as to provide versatility that allows adaptation to new situations.

Professional Skills

This course contributes to acquire the following professional skills, which are defined in the Section 5 of the Annex to the Orden CIN/352/2009:

en_CB1 - Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge about: linear algebra; geometry; differential geometry; differential and integral calculation; differential equations and partial derivatives; numerical methods; numerical algorithm; statistics and optimization.

Learning Outcomes

After succeeding in this subject the students will be able to:

RA1. Example

RA2. Another One.

RA3. And more.

3. CONTENTS

Contents Blocks	Total number of hours
Example Module 1.	x hours
	x hours
	x hours
	x hours

4. TEACHING - LEARNING METHODOLOGIES. FORMATIVE ACTIVITIES.

4.1. Credits Distribution

Number of on-site hours:	58 hours (56 hours on-site +2 exams hours)
Number of hours of student work:	92
Total hours	150

4.2. Methodological strategies, teaching materials and resources

The teaching strategy of the course is divided into 3 sections: classroom learning, learning in small groups and finally the working sessions in the laboratory.

Sessions of large group in the classroom:

Working sessions in the classroom, in large groups, will consist of lectures where the main concepts of the theory of circuits will be presented. The aim is to introduce students to the theoretical foundations of circuit analysis in a guided and reflective way. The understanding of these concepts will culminate with the use of them in both the laboratory and the problem solving sessions in small groups.

Teaching materials will be essential to create reflective learning environments, where students and teachers can undertake a critical analysis that allows the student to autonomously relate concepts.

The order of presentation of the contents will evolve from the simple to the complex, in order to avoid a high degree of abstraction that might cause a student lack of interest in the course. In any case, it is very convenient, during the working sessions in the classroom, to establish linkages with other subjects in the curriculum, and to provide possible experience on the contents, which will help to attract students' attention and will encourage their interest in the subject.

5. ASSESSMENT: procedures, evaluation and grading criteria

Preferably, students will be offered a continuous assessment model that has characteristics of formative assessment in a way that serves as feedback in the teaching-learning process.

5.1. PROCEDURES

The evaluation must be inspired by the criteria of continuous evaluation (Learning Assesment Guidelines, LAG, art 3). However, in compliance with the regulations of the University of Alcalá, an alternative process of final evaluation is made available to the student in accordance with the Learning Assesment Guidelines as indicated in Article 10, students will have a period of fifteen days from the start of the course to request in writing to the Director of the Polytechnic School their intention to take the non-continuous evaluation model adducing the reasons that they deem convenient. The evaluation of the learning process of all students who do not apply for it or are denied it will be done, by default, according to the continuous assessment model. The student has two calls to pass the subject, one ordinary and one extraordinary.

Ordinary Call

Continous Assessment:

The main assessment tools will be:

1. Problems (EP). Solving practical problems individually or in small groups. Solving practical problems individually or in small groups.

2. Laboratory Exercises (EL). Performance of laboratory practices and delivery of the corresponding reports. The evaluation will consider systematic observation, where the teacher will record the main difficulties and skills observed in each student, and the realization of a single memory by practice, by each of the groups of students who have done it.

3. **Assessment** Tests (PE). Performing written tests focused on both practical and theoretical aspects of the subject.

Students must attend 100% of the laboratory sessions and deliver the corresponding reports to all laboratory practices. Recovery sessions will be enabled for those students who have not attended any of the sessions and justify it documentarily.

The students, as a group, will deliver the reports of the laboratory practices following the established schedule. These practices will be evaluated by the professor responsible for the laboratory group, to assess if the objectives indicated in the script of the same have been met.

Assessment through final exam:

In the case of evaluation by means of a final exam, the evaluation elements to be used will be the following:

Extraordinary Call

The procedure will be the same as that described for the assessment by means of a final exam in the ordinary call.

5.2. EVALUATION

EVALUATION CRITERIA

The assessment criteria measure the level in which the competences have been acquired by the student. For that purpose, the following are defined::

CE1.

CE2.

CE3.

GRADING TOOLS

The work of the student is graded in terms of the assessment criteria above, through the following tools:

1. Ordinary call
    a. Continuous assessment, with three assessment exams (PEI1,PEI2,PEP3).
    b. Final assessment (PEF)
2. Extraordinary call. Final assessment (PEF)

GRADING CRITERIA

In the ordinary call-continuous assessment the relationship between the competences, learning outcomes, criteria and evaluation instruments is as follows.

Skill	Learning Outcomes	Evaluation criteria	Grading Tool	Contribution to the final mark
CTecTel1	RA1	CE1, CE6	EL	12,5%
CTecTel1	RA1, RA3, RA4	CE2, CE3, CE6	EL	12,5%
CTecTel1, CTecTel4	RA5	CE4, CE6	EL	12,5%
CTecTel1, CTecTel4	RA6	CE5, CE6	EL	12,5%

In the ordinary call-final evaluation, the relationship between the competences, learning outcomes, criteria and evaluation instruments is as follows.

Skill	Learning Outcomes	Evaluation criteria	Grading Tool	Contribution to the final mark
CtecTel1, CTecTel4	RA1, RA2, RA3, RA4, RA5, RA6	CE1, CE2, CE3, CE4, CE5, CE6	PL	50%
CtecTel1, CTecTel4	RA1, RA2, RA3, RA4, RA5, RA6	CE1, CE2, CE3, CE4, CE5, CE6	PEF	50%

Extraordinary call

In the case of the extraordinary call, the same percentages that have been established in the case of the evaluation by means of a final exam will be maintained, giving the option of making the PL or maintaining the mark obtained in the EL (continuous evaluation) or in the PEF (final evaluation), according to the student's decision. In any case, the PL will be made by those students who have not done it in the final exam option in the ordinary call.

6. BIBLIOGRAPHY

6.1. Basic Bibliography

- P. P. Vaidyanathan, Multirate Systems and Filter Banks. Englewood Cliffs, N.J.: Prentice Hall, 1993.
- H. S. Malvar, Signal Processing with Lapped Transforms, Artech House, Norwood, MA, 1992.
- K. R. Rao and P. Yip, Discrete Cosine Transforms, Academic Press, New York, 1990.

6.2. Additional Bibliography

- IEEE Transactions on Signal Processing.
- IEEE Communications Magazine

Disclosure Note

During the evaluation tests, the guidelines set out in the Regulations establishing the Rules of Coexistence of the University of Alcalá must be followed, as well as the possible implications of the irregularities committed during said tests, including the consequences for committing academic fraud according to the Regulation of Disciplinary Regime of the Students of the University of Alcalá.