

Academic Year/course: 2022/23

27211 - Statistics and IT

Syllabus Information

Academic Year: 2022/23

Subject: 27211 - Statistics and IT

Faculty / School: 100 - Facultad de Ciencias

Degree: 452 - Degree in Chemistry

ECTS: 6.0

Year: 2

Semester: First semester

Subject Type: Basic Education

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, problem-solving sessions, laboratory sessions, tutorial and autonomous work and study.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials, including a discussion forum.

The scripts and the datasets of the practical seasons are available at MOODLE platform (<http://moodle.unizar.es>).

4.2. Learning tasks

This is a 6 ECTS course organized as follows:

Activity 1: Acquisition of basic computer skills. Methodology: Participatory master classes in large groups. Case-based learning. (1 ECTS).

Activity 2: Solving problems using software tools. Methodology: Case-based learning. Computer lab classes. Team and individual work. (2 ECTS).

Activity 3: Exploratory data analysis and basic probability concepts. Methodology: Brief description of concepts and development of case studies with chemical data. Practical sessions in computer lab. (1.5 ECTS).

Activity 4: Statistical Inference. Methodology: Brief description of concepts and development of case studies with chemical data. Practical sessions in computer lab. (1.5 ECTS). The course includes the following learning tasks:

4.3. Syllabus

The course will address the following topics

Activity 1:

- Computer Science introduction. Computer Applications.
- Hardware and software. Operating systems. Computer networks. Programming languages.

Activity 2:

- Spreadsheets. Data management. Search for goals.
- Structured and modular programming. Data and control structures. Procedures and functions

Activity 3:

- Introduction to Statistics and fundamental concepts.
- Usefulness of Statistics in chemistry.
- Data types. Exploratory, one- and two-dimensional data analysis.
- Basic probability concepts. Random variables: definition and properties. Usual random variables.

Activity 4:

- Introduction to Statistical Inference.
- Point estimation.
- Interval estimation.
- Hypothesis testing.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Facultad de Ciencias website (<https://ciencias.unizar.es/grado-en-quimica-0>) and Moodle.

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27211>