27211 - Statistics and IT

Información del Plan Docente

Academic Year	2018/19
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

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

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: brief description of concepts and development of practical cases with chemical data (25 hours). Classes in the Computer Science lab with reduced groups (35 hours). Problem resolution and data analysis. Autonomous work. This includes individual study, individual work preparation and working with the teacher.

The course includes 25 lecture classes and 35 computer lab sessions in small groups. We propose a learning based on the critic reflexion about the concepts. To achieve these goals, we use a learning based on cases with chemical data. These learning processes aim to stimulate the initiative and personal creativity, the management of documentary sources, the reflection on theoretical aspects previously learned, and the structuring of a logical discourse that goes from the

approach of a problem to the conclusion of it.

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

4.2.Learning tasks

The course includes the following learning tasks:

- Activity 1: Basic Computer Science notions. Lectures promoting the interaction with students. Case-based learning. (1 ECTS). At the end of the activity there will be a mid-term test.
- Activity 2: Solving problems with software tools. Case-based learning. Computer lab sessions. Autonomous and teamwork (2 ECTS). At the end of the activity there will be a mid-term test.
- Activity 3: Exploratory data analysis and basic notions of Probability. Lectures introducing theoretical concepts and case-based learning with chemical datasets. Computer lab sessions. Autonomous work (1.5 ECTS).
- Activity 4: Statistical inference. Lectures introducing theoretical concepts and case-based learning with chemical datasets. Computer lab sessions. Autonomous work (1.5 ECTS).

4.3.Syllabus

The course will address the following topics:

- **Chapter 1: Basic notions**
  - Introduction to Computer Science. Computer Science applications
  - Hardware and software. Operating systems. Networks. Programming languages
- **Chapter 2: Software tools**
  - Spreadsheets. Data management. Goal search
  - Modular and structured programming. Data structures and control structures. Procedures and functions
- **Chapter 3: Descriptive statistics and basic concepts in probability**
  - Introduction and objectives of Statistics. Applications on Chemistry
  - Different types of data
  - Univariate and bivariate descriptive statistics
  - Basic concepts in probability and random variables
- **Chapter 4: Statistical inference**
  - Introduction to statistical inference
  - Point estimation of parameters
  - Confidence intervals
  - Tests of hypothesis
  - Nonparametric inference
  - Lineal regression models

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 web (https://ciencias.unizar.es/grado-en-quimica-0).

4.5.Bibliography and recommended resources

Online resources:

Universidad Zaragoza

27211 - Statistics and IT

[http://knuth.uca.es/]