

Degree programme	Type	Course
Applied Statistics	OP	4

Contact lecturer

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Prerequisites

Informatics Tools for Statistics

Linear Models 1

Linear Models 2

Advanced Modelling

Unsupervised Learning

Machine Learning 1

Aprenentatge Automàtic 1

Group languages

You can consult this information at the [end](#) of the document.

Objectives

Consolidate and offer new tools to start a professional career as a Statistician

The course's approach covers the different fields of application of consulting:

- Health sciences
- Banking and insurance
- Sociological studies and surveys

Learning outcomes

- CM14 (Propose the statistical model needed to analyse data sets belonging to real studies.) Propose the statistical model needed to analyse data sets belonging to real studies.
- KM17 (Recognise the statistical models for the analysis of data with different structures and complexities that frequently appear in different fields of application.) Recognise the statistical models for the analysis of data with different structures and complexities that frequently appear in different fields of application.

- SM16 (Select appropriate sources of information for the statistical work.) Select appropriate sources of information for the statistical work.
- SM17 (Discuss scientific articles in which the analysis of a study of the different areas of application is considered.) Discuss scientific articles in which the analysis of a study of the different areas of application is considered.
- SM18 (Refine the information available for subsequent statistical processing.) Refine the information available for subsequent statistical processing.
- SM19 (Analyse complex data, whether this is due to their characteristics or their size.) Analyse complex data, whether this is due to their characteristics or their size.

Contents

General Content

- The Statistician Profession
- SoCE
- CV
- Professional career
- Continuing studies

Practical aspects of the profession

- Report structure
- Work meetings
- Project briefing
- Study protocol
- Sample size determination
- Budgets
- Timeline/Schedule
- Project structuring
- R / SAS / Python software
- Communication of results

Review of competencies in statistical techniques

- Advanced models
- Cluster analysis
- Machine Learning, Data Science and Statistics
- Big Data
- Missing data imputation
- Causal inference
- Bayesian statistics

Complementary technical competencies

- Advanced reports with R Markdown

- Advanced graphics with R (Data Storytelling)
- Web applications with R-Shiny (Sample size)
- Web tutorials with R-learnr
- Complex procedures (Compare Groups Project)
- Version control with Git and GitHub

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Practical sessions	30	1.2	CM14, KM17, SM16, SM17
Theory	30	1.2	CM14, KM17, SM16, SM17, SM18, SM19
Practical cases	15	0.6	CM14, KM17, SM16, SM17

The course will follow the following working methodology:

- Theoretical classes
- Practical software sessions
- Evaluation of practical case studies

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Consulting group work - Individual contribution	20	12.5	0.5	CM14, KM17, SM16, SM18, SM19
Individual Project 2	15	12.5	0.5	CM14, KM17, SM16, SM17
Group project 1	15	12.5	0.5	CM14, KM17, SM16, SM17
Consulting group work	20	12.5	0.5	CM14, KM17, SM16, SM18, SM19
Group project 2	15	12.5	0.5	CM14, KM17, SM16, SM17
Individual Project 1	15	12.5	0.5	CM14, KM17, SM16, SM17

The course will be assessed through the resolution of different practical cases, carried out in groups or individually.

- Individual practical cases
- Sample size and simulations
- Kaggle

- Group practical cases
- Advanced graphics / web applications
- Technical article

- Group work
- Report
- Oral presentation

- Participation in assessment activities
- Contributions
- Questions

Single Assessment

This course does not provide for the possibility of single assessment.

Not Assessable

If the student has not submitted more than 60% of the weighted assessment activities, it will be considered that there is insufficient assessment evidence and the grade assigned will be Not Assessable.

Use of AI tools

For this course, the use of Artificial Intelligence (AI) technologies is permitted exclusively in autonomous activities for support tasks (bibliographic or information searches, text correction, and statistical programming correction). Students must clearly identify which parts have been generated using this technology, specify the tools used, and include a critical reflection on how these have influenced the process and final outcome of the activity. Lack of transparency in the use of AI will be considered a breach of academic integrity and may result in a partial or total penalty on the activity's grade, or more severe sanctions in serious cases.

Bibliography

Cabrera, J.; McDougall A. (2002). Springer-Verlag New York. Statistical Consulting

Statistical Rules of Thumb - Gerald Van Belle - Wiley Series in Probability and Statistics

Common Errors in Statistics (and How to Avoid Them) - Good, Hardin - Wiley

SAS and R: Data Management, Statistical Analysis, and Graphics - Kleinman , Horton - Chapman and Hall

SAS for Mixed Models, Second Edition - Little et al - SAS Publishing

Software

SAS, R, Python, Latex, Markdown, RShiny

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	1	Catalan	first semester	afternoon
(SEM) Seminars	1	Catalan	first semester	afternoon