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TEACHING GUIDE - 2025-2026

Applied Statistics for Management

UGRA_016186

Departments	Data, Analytics, Technology and Artificial Intelligence (DATA), Dept. of Operations, Innovation & Data Sciences
Teaching Languages	English
ECTS	6
Teacher responsible	Carlota Torrens Csonka - carlota.torrens@esade.edu

Course Goals

Identify when a statistical technique is appropriate for a problem. Selecting the correct statistical method is an important component to drawing appropriate conclusions in a study. Choosing the correct statistical test to analyze results is essential in interpreting the validity of the study and centers on defining the study variables and purpose of the analysis. Students will learn the different branches of Statistics and the concepts and techniques to be able to use them in the appropriate situations.

Apply statistical reasoning to real-world problems. Students will learn to make decisions based on statistical findings obtained from tools such as Excel. They will use probability calculations and probability models to make decisions.

Communicate statistical findings. Using charts which are not ideal for a certain type of data can provide incorrect information and draw inaccurate conclusions. Selecting the appropriate charts makes insights more apparent for the audience and easy to understand. Students will learn to visualize data, interpret the results, and present their statistical findings in an ethical manner.

Cultivate autonomous learning. Becoming an autonomous learner requires the ability to effectively read and comprehend technical materials, identify important concepts, and extract relevant information. Students will become aware and responsible of their own learning, by evaluating their progress and understanding, identifying areas for improvement, and exploring additional sources of information, to deepen their understanding of the topics and expand their knowledge beyond the course materials. They will also acquire the confidence and capability to seek assistance when facing challenges, either by collaborating with peers, or engaging with instructors and teaching assistants.

Previous knowledge

Having a basic knowledge of some statistical parameters and graphs is also essential. This understanding will help you correctly follow the course and grasp more advanced statistical concepts as you progress. Familiarity with parameters such as mean, median, and standard deviation, as well as the ability to understand basic graphs, is recommended prior knowledge for successfully following the course.

Prerequisits

To successfully follow this course on statistics, it is essential to have a solid understanding of basic mathematical operations. This includes knowing how to work with proportions and linear functions, as these concepts are foundational for grasping more complex statistical methods.

Teaching methodology

The course combines lectures and participatory sessions:

- Lectures: In these sessions, faculty will combine theoretical explanations with examples.
- Participatory sessions: In these sessions, students will be asked to work by themselves or work in groups to solve exercises and real-world cases.
- Tests. After every one or two topics there will be a short test.

NOTE: Students must achieve a minimum grade of 5.0 on the final exam(s) of a course to be eligible to pass the course: a grade lower than 5.0 in the exam will become the student's final grade without averaging in other assessments. This rule applies to retake exams as well.

Description

Course contribution to program

Statistics is an essential tool for decision-making in environments where the volume of data and the level of uncertainty make it difficult to directly extract useful information. This course provides both the theoretical and practical foundations needed for effective decision-making in the face of uncertainty. By understanding statistical methods, students will be able to analyze and interpret data, identify trends, and make informed decisions based on empirical evidence.

These skills are particularly crucial for future leaders and managers, who must navigate complex and rapidly changing environments. The ability to leverage statistical analysis enables them to make strategic decisions, optimize processes, and anticipate future challenges. In a transformative world where data-driven insights are increasingly vital, having a strong foundation in statistics empowers individuals to lead with confidence and adapt to new situations with agility and informed judgment.

Short description

Statistics is an essential tool for decision-making in environments where the amount of data and/or level of uncertainty do not allow the information contained to be extracted directly. This course provides some of the theoretical and practical foundations needed for decision-making in the face of uncertainty. This course introduces students to intuition for analyzing, interpreting, and presenting empirical data, using basics of probability and making predictions using inferential statistics.

Bibliography

Paul Newbold, Statistics for business and economics global edition,, LONGMAN, 9781292436845 (Book)
David Diez, Mine Cetinkaya-Rundel, Christopher D Barr, OpenIntro Statistics, OpenIntro, Inc., 1943450072 (Book)

Activities

Analytical exercises
"Applied Statistics". To help students in the comprehension of each topic they solve and analyse more advanced problems (1.5 hour/week). Additional exercises are solved individually at home. These exercises will be discussed, and any doubts will be addressed in class.

Written and/or oral exams
Two final exams will be held to assess student's understanding of the course material.
An average score of at least 5 out of 10 on the exams, with no individual score below 4, is required to compute the final course average, in accordance with the grading scheme.
To pass the course, a final course average of at least 5 is required.

Other
"Lectures". Professors will introduce the framework and content of each topic (1.5 hour/week).

Quizzes/tests
There will be an individual quiz after the completion of every one or two topics to assess what students have learned about the topic. These quizzes are part of students' continuous assessment for the course. (0.25h/week).

Practical exercises with professional software
"Statistics everywhere". These are presential participatory sessions (1.5 hour/week) where practice and real-world cases will be introduced. Excel will be used as the main course tool.

Content

#	Topic
1	Descriptive Statistics: • Understand what randomness is. • Classify random variables according to measurement scales. • Understand, use, and apply unidimensional and bidimensional frequency distributions. • Interpret graphs. • Understand, use, and calculate measures of central tendency, variability and relationship between variables. • Introduction to simple and multiple regression.

#	Topic
2	Introduction to Probability and Probability distributions: • Understand basic concepts related to the probability field. • Interpret and graph the probability and cumulative distribution functions (discrete variables) / density and cumulative distribution functions (continuous variables) • Understand and apply the Central Limit Theorem. • Sampling distributions.
3	Inferential statistics • Understand the concept of confidence intervals. • Understand the concept of hypothesis testing.

Assessment

Tool	Assessment tool	Category	Weight %
In-class analysis and discussion of issues	Class participation, interaction, and teamwork	Retake and ordinary round	10.00%
Quizzes/tests	Individual continuous assessment	Retake and ordinary round	25.00%
Quizzes/tests	Individual Excel quiz	Retake and ordinary round	5.00%
Written and/or oral exams	Midterm Exam	Ordinary round	30.00%
Written and/or oral exams	Final Exam	Ordinary round	30.00%
Written and/or oral exams	Retake exam	Retake	60.00%

PROGRAMS

BITLASI22-Bachelor in Transformational Leadership and Social Impact (Undergraduates: Business)
BITLASI22 Year 1 (Basic)