

APPLIED STATISTICAL METHODS

Degree in Touristic Activities Management

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Code: 12305

Main Scientific Area: Mathematics and Statistics

Lecturer: Estela Maria dos Santos Ramos Vilhena

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 60h Total Workload: 108h

ECTS: 6,0

Objectives

Practically every aspect of daily life is related to the observation and treatment of quantitative data, and therefore with the application of statistical methodologies. This situation finds often deficient and even dangerous responses and interpretations, frequently due to the lack of adequate theoretical and methodological knowledge. Thus, the statistical work has to be to help plan, obtain, analyze and interpret the data and present the results in order to summarize the information and facilitate the decision-making. It becomes essential to discover patterns and extract knowledge from sample data and to infer to the population. Thus, this course is intended to sensitize the students to the importance of the correct resolution of real problems that nowadays, increasingly tend to be of large numbers, providing students with the control of the basic techniques and quantitative methodologies and in the data processing, analysis and inference from this.

Learning Outcomes

Skills to develop: distinguish between population and sample; organize and summarize data from statistical studies; identify and classify variables; decide which measures can be used in different situations, their advantages and disadvantages; create and interpret graphs; understand fundamental concepts of probability; identify the most important probability distributions; estimate and interpret population unknown parameters; perform, interpret and make decisions based on confident intervals and hypothesis tests.

Course Contents

Descriptive Statistics and Inferential Statistics. Sample and population. Different types of data. Data presentation:

charting and graphing. Histogram. Pareto graph. Statistics and parameters. Measures of location and dispersion.

Boxplot. Measures of skewness and kurtosis.

Probability spaces. Sample space. Events. Total probability theorem and Bayes' theorem. Independence of events. Mutually exclusive events. Random variables. Theoretical distributions. Importance of Normal distribution.

Sampling methods. Sampling distributions. Central limit theorem. Point estimation. Properties of Estimators.

Confidence intervals.

Hypothesis Tests. Null hypothesis and alternative hypothesis. Type I and type II errors. Power of a statistical test.

Pvalue. Relation between confidence intervals and hypothesis tests. Normality tests. Q-Q Plot and P-P plot.

Recommended Bibliography

Reis, E.; Melo, P.; Andrade, R.; Calapez, T. (2001); "Estatística Aplicada" – Vol 1 e 2, 4ª Ed, Edições Sílabo

A. Robalo: Estatística – Exercícios – Vol 1 e 2, Edições Sílabo

A. L. Webster: Estatística Aplicada à Administração e Economia, McGraw-Hill, 2007

J. Carlos Castro Pinto, J. J. Dias Curto: Estatística para a Economia e Gestão, Edições Sílabo, 2000

Learning and Teaching Methods

Contents: Descriptive Statistics and Inferential Statistics. Sample and population. Different types of data. Data presentation: charting and graphing. Histogram. Pareto graph. Statistics and parameters. Measures of location and dispersion. Boxplot. Measures of skewness and kurtosis. Independence and covariance.

Main Objectives: distinguish between population and sample; organize and summarize data from statistical studies; identify and classify variables; decide which measures can be used in different situations; create and interpret graphs.

Contents: Probability spaces. Sample space. Events. Total probability theorem and Bayes' theorem.

Independence of events. Mutually exclusive events. Random variables. Theoretical distributions. Importance of Normal distribution.

Main Objectives: understand fundamental concepts of probability; identify the most important probability distributions.

Contents: Sampling methods. Sampling distributions. Central limit theorem. Point estimation. Properties of Estimators.

Main Objectives: make a correct inferencial statistics; estimate and interpret population unknown parameters.

Contents: Hypothesis Tests. Null hypothesis and alternative hypothesis. Type I and type II errors. Power of a statistical test. P-value. Relation between confidence intervals and hypothesis tests. Normality tests. Q-Q Plot and P-P plot.

Main Objectives: make a correct inferencial statistics; properly perform, interpret and make decisions based on confident intervals and hypothesis tests; identify variables that affect a given response.

Assessment Methods

The evaluation will be based on two exams and two exercises. Each exam will have a weighting of 45% and each exercise will have a weighting of 5% in the final classification.