

29005 - Applied statistics

Información del Plan Docente

Academic Year	2017/18
Faculty / School	228 - Facultad de Empresa y Gestión Pública
Degree	429 - Degree in Public Management and Administration
ECTS	6.0
Year	1
Semester	Half-yearly
Subject Type	Basic Education
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The learning process that has been designed for this subject is based on the following:

Given the applied nature of the subject, the practical aspects will predominate in the methodology. However, it will be necessary to have mastery of a series of basic theoretical contents, to be able to solve the practical assumptions with the appropriate tools, and to interpret the results correctly.

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5.2. Learning tasks

Given the fact that this is mostly an applied subject, practical aspects will prevail in the methodology used. Nevertheless, students will need to master basic theoretical content to be able to solve mathematical problems with the appropriate tools, as well as to interpret results accurately.

During the second term, the students' timetable marks two two-hour-face to face sessions for this subject. The blackboard, together with the projection of lecture notes, previously available to students at the ADD and some other online resources, will be used to expose theoretical and practical content. Content related mathematical problems, whose solution will be shown through EXCEL spreadsheets, will also be done in the classroom.

In the periods allocated for practices, more in depth work will be done in small groups involving problem solving and essay writing.

At face-to-face tutorial time, students will be individually catered for to solve any doubts that might arise during their learning process.

5.3. Syllabus

MODULE I: DESCRIPTIVE STATISTICS

1. Introduction. General concepts. Meanings of the term Statistic. A brief history. Applications of statistics in different fields of knowledge, paying particular attention his presence in the field of Public Administrations.
2. Frequency distribution. Graphic representations. Statistical variable. Attribute. Frequency distributions.
3. Measures of location. Arithmetic mean and properties. Geometric mean. Harmonic mean. Median. Mode. Quartiles.
4. Measures of variability. Range, semi-interquartile range, mean deviation, variance, standard deviation. Coefficient of variation.
5. Shape and concentrations parameters. Pearson's coefficient of skewness. Fisher's coefficient of skewness. Bowley's coefficient of skewness. Kurtosis coefficient g_2 . The GIM Index. The Lorenz curve.
6. Bivariate distributions. Bivariate frequency distribution. Graphic representation. Marginal distributions. Conditional distributions. Independent Statistics. Covariance.
7. Adjustment methods. The Method of Least Squares. The Linear adjustment.
8. Regression and correlation. Regression lines. Regression coefficient. Linear correlation coefficient.

MODULE II: SPECIAL TECHNIQUES

9. Index numbers. Simple and composite index numbers. Price index numbers. Quantity index numbers. Deflation (inflation adjustment). Consumer price index (CPI)
10. Time series. Numerical and graphical representations. Time series components: trend, cyclical, seasonal and irregular. Additive and multiplicative models.

MODULE III: PROBABILITY AND RANDOM VARIABLES

11. Introduction to Probability. Sample space. Events. Formal definition of probability. Counting techniques.

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12. Conditional probability and independence. Total probability theorem. Bayes theorem.

13. Random variables and probability distributions. Discrete probability distributions: binomial and Poisson. Mean and standard deviation of a discrete probability distribution.

14. Continuous probability distributions: Normal distribution. The probability density function of the normal distribution. Applications.

5.4.Course planning and calendar

Schedule sessions and presentation of Works:

Week		Duration
1	Teacher presentation . Comment of the teaching guide. 1. Introduction. 2. Frequency distribution. Graphic representations .	4 hours
2	3. Measures of location. 4. Measures of variability	4 hours
3	5. Shape and concentrations parameters	4 hours
4	5. Shape and concentrations parameters	4 hours
5	6. Bivariate distributions 7. Adjustment methods	4 hours
6	8. Regression. Correlation	4 hours
7	9. Index numbers	4 hours
8	9. Index numbers	4 hours
9	10. Time series	4 hours
10	10. Time series	4 hours

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11	10. Time series	
	11. Introduction to Probability	4 hours
12	12. Conditional probability and independence	
	13. Random variables and probability distributions	4 hours
13	13. Discrete probability distributions	4 hours
14	14. Continuous probability distributions : Normal distribution	4 hours
15	Probability problems	4 hours

Working time (in hours):

Attendance to theoretical classes: 30

Attendance to practical classes: 30

Tutoring assistance: 8

Autonomous student work: 77

Testing: 5

Total student work: 150 (6 ECTS)

5.5. Bibliography and recommended resources

[BB: Basic bibliography / BC: Complementary bibliography]

- [BB] Martín Pliego, Francisco Javier. Introducción a la estadística económica y empresarial : teoría y práctica / Fco. Javier Martín-Pliego López . 3a. ed. rev. y act. , 5ª reimp. / por Marta García Secades Madrid : Thomson, 2009
- [BC] Casas Sánchez, José Miguel. Introducción a la estadística para economía y administración de empresas / José M. Casas Sánchez, Julián Santos Peñas . Madrid : Editorial Centro de Estudios Ramón Areces 1995
- [BC] Fernández Cuesta, Carlos. Curso de estadística descriptiva : teoría y práctica / Carlos Fernández Cuesta y Felipe Fuentes García . [1a ed.] Barcelona : Ariel, 1995
- [BC] Hanke, John E.. Estadística para negocios / John E. Hanke, Arthur G. Reitsch ; traducción de Marcia González Osuna ; revisión técnica de Mario Cortina Borja . 2a. ed. Madrid[etc.] : McGraw-Hill, D.L.1997
- [BC] Llorente Galera, Francisco. Principios de estadística descriptiva aplicada a la empresa / Francisco Llorente Galera, Susana Marín Fera, Salvador Torra Porrás . Madrid : Centro de Estudios Ramón Areces, D.L. 2000
- [BC] Manteca Ramos, I.. Cuestiones y problemas resueltos de Estadística / Isidoro Manteca Ramos y Joaquín Sánchez Soriano Alicante : Ed. Gamma, 1995
- [BC] Martín Pliego, Francisco Javier. Curso práctico de estadística económica / F. Javier Martín Pliego . [Reimp.] Madrid : AC, 1990
- [BC] Muñoz Vázquez, A. Problemas de Estadística. Estadística Descriptiva / A. Muñoz Vázquez, E.D. Lozano Aguilera, J. Rodríguez Avi y J.C. Ruiz Molina Jaén, 1993
- [BC] Peña Sánchez de Rivera, Daniel. Estadística : modelos y métodos. Vol. 1, Fundamentos / Daniel Peña Sánchez de Rivera . [2ª ed. rev., 12ª reimp.] Madrid : Alianza, 2000