

COURSE SYLLABUS

2015-2016

1. COURSE DESCRIPTION

Degree:	Human Nutrition and Dietetics
Subject:	Biostatistics
Module:	Basic Science
Department:	Economics, Quantitative Methods and Economic History
Academic course:	2015-2016
Semester:	Second
ECTS:	6
Course:	First
Type:	Mandatory
Language:	English

Model:	C1	
a. Basic Teaching (EB):		50%
b. Practical Teaching and Development (EPD):		50%
c. Guided activities (AD):		



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2. TEACHING TEAM INFORMATION

Name:	M^a del Rosario Rodríguez Griñolo
Center:	University Pablo de Olavide
Department:	Economics, Quantitative Methods and Economic History
Area:	Statistics and Operations Research
Office Hours:	Monday and Wednesday 1:00-2:00 p.m. Tuesday 4:00-6:00 p.m. By appointment.
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3. ACADEMIC CONTEXT

3.1. Course Description and Objectives

The main objectives of this course include fostering critical thinking skills and preparation for further work in the scientific traditions that require the collection and statistical analysis of data.

Moreover, developing the ability to assess the probability of a simple random event, interpreting the result of a simple statistical study, and solving mathematical problems with the use of technology, particularly the SPSS software, are also key objectives in this course.

3.2. Contribution to the formative teaching

This course will provide students with basic knowledge of the statistical techniques and tools that are necessary in their future research and their work as nutritionists.

The course has a strong practical approach, emphasizing the use of a particular statistical software, the SPSS program.

3.3. Recommendations or Prerequisites

Although no prerequisites are needed, students should have knowledge of basic mathematics.

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4. Competences

4.1 Degree competences developed in this course

- Possession of knowledge and understanding of their area of study.
- Ability to apply knowledge to their work area and ability to develop and justify arguments, as well as solve problems.
- Ability to communicate information, ideas, problems and solutions in public.
- Capacity for analysis and synthesis.
- Competence to express ideas in both written and oral forms.
- Planning and time management.
- Research skills.
- Review capacity.
- Teamwork abilities.
- Basic computer skills.
- Competence in the field of new technologies and innovation management.

4.2. Module competencies developed in the course

- Knowledge of the statistics tools applied to Health Sciences.
- Capacity for analysis and synthesis and ability to express knowledge in both oral and written form.
- Planning and time management.
- Research skills and teamwork.

4.3. Specific competencies in this course

- Learning the basics of statistics and its application in Health Sciences.
- Ability to apply basic statistical methodology for the design of a project or research paper.
- Learning to correctly interpret the results of an empirical investigation.

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5. COURSE CONTENT (COURSE TOPICS)

Part I: Descriptive Statistics

Unit 1: Univariate Descriptive Statistics.

Introduction to descriptive statistics, probability and inference. Qualitative and quantitative features. Discrete and continuous variables. Statistical tables. Graphics and features of univariate distribution. Measurement of central tendency, dispersion and form. Applications with SPSS.

Unit 2: Bivariate Descriptive Statistics.

Bidimensional statistics variables. Two-dimensional table. Conditional distributions. Independence between variables. Dispersion plot. Regression and correlation. Fitting a line to points. Least square methods. R-square or coefficient of determination. Applications with SPSS.

Part II. Probability.

Unit 3: Introduction to probability.

Concepts in Probability Theory. Definition of probability. Finite sample space. Laplace's rule. Combinatorics. Conditional probability and independent events. Total probability theorem. Bayes' Theorem. Diagnostic Tests.

Unit 4: Random variables and probability distributions.

Discrete random variables and their probability distributions. Bernoulli, Binomial, Poisson and Geometric Distribution. Continuous random variables and their probability distributions. Exponential, Normal, Chi-square, t-student and F-Snedecor distributions. Central Limit Theorem.

Part III: Inferential Statistics.

Unit 5: Introduction to Inferential Statistics.

Point estimator. Confidence interval. Estimator's distribution. Applications with SPSS.

Unit 6: Theory of sampling.

Introduction to Sampling. Random and non random sampling. Simple random sampling, Stratified sampling, Cluster sampling and Systematic sampling. Confidence intervals in simple random sampling. Sample size determination. Errors.

Unit 7: Statistical inference: Hypothesis Testing.

Introduction to hypothesis tests. Significance and p-value. Error type I and II. Parametric tests: Hypothesis tests for difference of means. t-student test and ANOVA. Nonparametric test. Applications with SPSS.



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6. METHODOLOGY AND RESOURCES

To achieve the objectives, this course is structured around basic teaching (EB) and training and development activities (EPD):

Basic Teaching (EB). In these sessions, students will form a single group. Theoretical concepts and the main statistics tools will be explained with supporting materials such as the board and/or slides.

Training and Development Activities (EPD). These sessions will be held in ordinary classrooms and computer laboratories, where exercises related to the theoretical explanation will be solved on the board or by using SPSS.

Materials:

All materials (slides, formulas, statistics tables, homework and important dates) for this course will be distributed and managed via Blackboard Learn.

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7. ASSESSMENT

The evaluation of this subject will consist of two parts: one part which will consist of continuous assessment (50% of the final grade) and another part corresponding the first exam call of the course (50% of the final grade).

1.- Continuous assessment:

There will be two semester exams. Both exams will have to be completed without the help of materials.

Exam 1. 8th-10th week.

This exam will cover Part I of subject contents. The exam will consist of several problems to be solved by using a computer, and particularly using the SPSS program. The exam will have to be solved in 60-75 minutes. No materials are allowed in this exam.

Exam 2 13th – 15th week.

This exam will cover Part III of subject contents. The exam will consist of several problems to be solved by using a computer, and particularly using the SPSS program. The exam will have to be solved in 60-75 minutes. No materials are allowed in this exam.

Grade of continuous assessment: 0.5 grade of exam 1 + 0.5 grade of exam 2

To pass the continuous assessment section, the student must obtain at least 4 out of 10 in each exam. This part of the assessment is exclusively under a continuous scheme. If at least one exam is missed or has been assessed as poor (less than 4 out of 10), the subject grade will not be calculated and a new final exam will have to be taken in the second exam call in July.

2.-First call. Final Exam.

The date will be announced in due course.

This exam will cover Part I, II and III and it will consist of two parts:

- 1.- A multiple choice exam (from 15 to 20 items). This test must be solved in 20-30 minutes and a formula card, statistics tables, as well as a calculator are allowed.
- 2.- Several problems which will have to be solved. This part must be solved in 2 hours and a formula card, statistics tables, as well as a calculator are allowed.



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If the final exam is missed or has been assessed as poor (less than 4 out of 10), the subject grade will not be calculated and a new final exam will have to be taken in July (second call).

Grade of Final Exam: 0.3 multiple choice test + 0.7 problems exam

The subject mark will be calculated using the following weights:

Subject grade: 0.5 continuous assesstment + 0.5 final exam assessment
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The subject will be passed if the subject grade is equal to or higher than 5 points out of 10.

Exceptionally, grades of the two parts may be compensated. This compensation is applied only if the student has as average grade higher than or equal to 5 (out of 10) in each part. In such case, only the part that the student has not passed will be assessed in the second call.(Part 1 or Part 2 in the second call).

Each student can refuse their grade obtained in the continuous assessment through explicit waiver. Such waiver must be communicated in writing to the lecturers of the subject, with a minimum period of 10 days before the exam. In such case, the student will do the multiple choice exam and the problems exam (Part 1) in the second call.

Second Call (July):

The date will be announced in due course.

This exam will consist of two parts:

Part 1.- A multiple choice test and some problems to be solved by hand (50% of the subject grade). This part must be solved in 2 hours and a half.

Part 2.- Several problems to be solved by using a computer (50% of the final grade). This part must be solved in 70-90 minutes.

The final mark will be calculated using the following weights:

Subject grade: 0.5 Part 1 + 0.5 Part 2

The course will be passed if the final mark is equal to or higher than 5 points out of 10.

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8. REFERENCES

- Baldi, Brigitte and David S. Moore (2012). The practice of statistics in the life sciences. New York: W.H. Freeman and Company.
- Kinnear P.R. & Gray C.D. (2008). SPSS 16 Made Simple. Psychology Press, New York
- Moore, David S. (2007). The basic practice of statistics. New York, W.H. Freeman and Company.
- Steinberg, Wendy J.. (2011). Statistics Alive!. Sage. California.
- Sullivan, Michael. (2013). Statistics: Informed Decisions Using Data. Pearson. Boston.
- Triola, Mario. (2007). Elementary Statistics. Pearson. Boston

More references:

- Barbancho A.G. (1994). Estadística Elemental Moderna. Ariel, Barcelona.
- Casas Sánchez J.M. (1997). Inferencia Estadística. Centro de Estudios Ramón Areces, Madrid.
- De la Horra Navarro J. (2003). Estadística Aplicada. Díaz de Santos, Madrid.
- Fernández Cuesta C. & Fuentes García F. (1995). Curso de Estadística Descriptiva: Teoría y Práctica. Ariel, Barcelona.
- Fernández-Abascal H., Guijarro M., Rojo J.L. & Sanz J.A. (1995). Ejercicios de Cálculo de Probabilidades: Resueltos y Comentados. Ariel, Barcelona.
- Johnson R. & Kuby P. (1999). Estadística Elemental. Lo Esencial. International Thomson Editores, México.
- Lopes P.A. (2000). Probabilidad y Estadística: Conceptos, Modelos, Aplicaciones en Excel. Prentice Hall, Colombia.
- López Cachero M. (1996). Fundamentos y Métodos de Estadística. Pirámide, Madrid.
- Martín-Pliego López F.J., Montero Lorenzo J.M. & Ruíz-Maya Pérez L. (2005). Problemas de Inferencia Estadística. Thomson Paraninfo, Madrid.
- Martín-Pliego López F.J. & Ruiz-Maya Pérez L. (2006). Fundamentos de Probabilidad. Thomson Paraninfo, Madrid.
- Martín-Pliego López F.J., Ruiz-Maya Pérez L. & Montero Lorenzo J.M. (2006). Problemas de Probabilidad. Thomson Paraninfo, Madrid.
- Mendenhall W., Scheaffer R.L. & Ott R.L. (2006). Elementos de Muestreo. International Thomson Editores, México.
- Pardo Merino A. & Ruiz Díaz M.A. (2005). Análisis de Datos con SPSS 13.

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McGraw-Hill, Madrid.

- Peralta Asturdillo M.J., Rúa Vieytes A., Redondo Palomo R. & Del Campo Campos C. (2000). Estadística. Problemas Resueltos. Pirámide, Madrid.
- Ruíz-Maya Pérez L. & Martín-Pliego López F.J. (2005). Fundamentos de Inferencia Estadística. Thomson Paraninfo, Madrid.
- Santos Peñas J., Muñoz Alamillos A., Juez Martel P. & Guzmán Justicia L. (1999). Diseño y Tratamiento Estadístico de Encuestas para Estudios de Mercado. Centro de Estudios Ramón Areces, Madrid.
- Spiegel M.R. (1997). Teoría y Problemas de Probabilidad y Estadística. McGraw-Hill, Madrid.
- Tomeo Perucha V. & Uña Juárez I. (2003). Lecciones de Estadística Descriptiva. Thomson Paraninfo, Madrid.
- Uña Juárez I., Tomeo Perucha V. & San Martín Moreno J. (2003). Lecciones de Cálculo de Probabilidades. Thomson Paraninfo, Madrid.
- Visauta Vinacua B. (2007). Análisis Estadístico con SPSS 14. Estadística Básica. McGraw-Hill, Madrid.
- Visauta Vinacua B. (2001). Análisis Estadístico con SPSS para Windows. Estadística Multivariante. MacGraw-Hill, Madrid.
- Wisniewski P.M. & Velasco Sotomayor G. (2001). Probabilidad y Estadística para Ingeniería y Ciencias. International Thomson Editores, México.