COURSE SYLLABUS

1. COURSE DESCRIPTION

Degree:	**Human Nutrition and Dietetics**
Subject:	**Biostatistics**
Module:	**Basic Science**
Department:	**Economics, Quantitative Methods and Economic History**
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:	**Mª 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**.
Office:	**3.2.26**
E-mail:	**mrrodgri@upo.es**
Telephone number:	**954349167**

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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 Training Plan

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.

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: Univariant 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. Aplications with SPSS.

Part II. Probability.

Unit 3: Introduction to probability.
 Concepts in Probability Theory. Definition of probability. Fine 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. Bernouilli, 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 Inferencial Statistics.
Puntual stimator. Confidence interval. Stimator's distribution. Applications with SPSS.

Unit 6: Theory of sampling.
Introducion to Sampling. Ramdon 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: Hypotesis 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.
Nonparamentrics test. Aplications with SPSS.

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.

7. ASSESSMENT

There will be two semester exams and one final exam.
All exams will have to be completed without the help of materials, with the exception of a formula card and statistics tables, as well as a calculator.

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.

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.

If at least one exam is missed or has been assesed 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.

Final exam (First Call): 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).
      2. -Several problems which will have to be solved.

If the final exam is missed or has been assesed 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).

<u>Assessment:</u> The subject mark will be calculated using the following weights:

- exam 1+exam 2= 50%,
- final exam= 50% (20% multiple choice and 30% problems solved).

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

Exceptionally, grades of the two assessment tests may be compensated. This compensation is applied only if the student has as average grade greater or equal of 5 (over 10). In such case, the student will examine, in second call, the part that he\she has not been passes during the course

If at least one exam is missed or has been assesed as poor (less than 4 out of 10 in Final exam and less than 4 out of 10 in exam 1 or 2) the subject grade will not be calculated and a new final exam will have to be taken in July.

<u>Second Call:</u>

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This exam will consist of a multiple choice test and some problems to be solved by hand (50%), and several problems to be solved by using a computer (50%). The course will be passed if the final mark is equal to or higher than 5 points out of 10

8. REFERENCES

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More references:

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