

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Basic Common Knowledge	Statistics	1º	2º	6 (4.5T + 1.5P)	Obligatory
<b>LECTURER(S)</b>			<b>Postal address, telephone nº, e-mail address</b>		
Groups C and E: Dr. Francisco M. Ocaña Peinado Email: <a href="mailto:fmocan@ugr.es">fmocan@ugr.es</a> Web: <a href="http://www.ugr.es/local/fmocan">http://www.ugr.es/local/fmocan</a>			Dpto. of Statistics and Operative Research, Faculty of Pharmacy Tutoring hours: Tuesday and Thursday, 9.30-12.30		
<b>DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT</b>			<b>OTHER DEGREE IN WHICH THE SUBJECT COULD BE TAUGHT</b>		
Degree in Human Dietetics and Nutrition			Degree of Food Science and Technology		
<b>PREREQUISITES and/or RECOMMENDATIONS (if necessary)</b>					
Recommendations: Basic knowledge about: linear equation, logarithms and their properties, solving linear equation systems, derivation and integration					
<b>BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE ¿??)</b>					
Statistical basis of Health Sciences, which are specified in the following points:  <ol style="list-style-type: none"> <li>1. Introduction to Statistics. Descriptive analysis of statistical data.</li> <li>2. Statistical regression models.</li> <li>3. Probability and random variables (probability distributions).</li> <li>4. Statistical Inference: estimation and hypothesis testing.</li> <li>5. Introduction to Statistical sampling.</li> <li>6. Design of diets by linear programming.</li> </ol>					
<b>GENERAL AND PARTICULAR ABILITIES</b>					
<b>A. <u>General competences</u></b>					
<b>CG2.</b> Develop professional activity with respect to other health professionals, acquiring skills for teamwork.					



**CG6.** Understand, critically evaluate and know how to use and apply sources of information related to nutrition, food, lifestyles and health aspects.

**CG15.** Design and implement protocols for assessment of nutritional status and identify nutritional risk factors.

**CG20.** Know and intervene in the design, implementation and validation of nutritional epidemiological studies and participate in the planning, analysis and evaluation of intervention programs in feeding and nutrition

**CG29.** Learn basic training to research activity, being able to formulate hypotheses, collect and interpret information for troubleshooting following the scientific method, and understanding the importance and limitations of scientific thinking in health and nutrition.

### **B. Specific Competences**

**CE3.** Knowing the statistics applied to the Health Sciences.

**CE7.** Acquire teamwork skills as a unit in which are structured uni or multidisciplinary and interdisciplinary professionals and other staff related to the diagnostic evaluation and treatment of diet and nutrition.

### **OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)**

Apply the concepts of descriptive statistics and regression (performing simple calculations by hand and others using a statistical package) related to diet and nutrition, with special attention to the interpretation of results phenomena.

Understanding the randomness that governs many phenomena of Health Sciences and the study of some basic probability models.

Acquire and understand the way of thinking in situations where Inference and sampling for optimal decision making is used.

Evaluate the results of a dietary treatment from statistical data. Learning techniques for preparing linear optimization diets.

Interpret findings of scientific publications in your field, when statistical procedures course syllabus used.

To provide students the basis to apply in the future more complex than those detailed in the program statistical

### **DETAILED SUBJECT SYLLABUS**

### **DETAILES SYLLABUS OF THE PROGRAMME**



## THEORETICAL SYLLABUS

### ***UNIT 1: Descriptive analysis of statistical data.***

#### ***(Nº of approximate hours: 6)***

Introduction to Statistics. Types of statistical variables and graphical representations. Statistical measures. Dimensional statistical variables. Covariance and lineal correlation coefficient.

### ***UNIT 2: Statistical regression models.***

#### ***(Nº of approximate hours: 8)***

Introduction. Regression using the minimum square adjustment method. Linear regression using the minimum squares adjustment method. Parabolic regression using the minimum squares adjustment method. Non-polynomial regression. Applications to some typical problems of Nutrition and Dietetics.

### ***UNIT 3: Probability and random variables.***

#### ***(Nº of approximate hours: 8)***

Introduction to Probability. Concept of random variable. Discrete and continuous random variables. Expectation and variance. Study of selected discrete and continuous distributions of probability: Binomial, Poisson, normal, exponential.

### ***UNIT 4: Introduction to statistical inference.***

#### ***(Nº of approximate hours: 8)***

Point estimation and by intervals. Confidence intervals for the mean, variance, proportion and mean difference. Formulation of a hypothesis test. Contrasts on the parameters of a normal model. Independence contrast between qualitative variables.

### ***UNIT 5: Introduction to statistical sampling.***

#### ***(Nº of approximate hours: 8)***

General concepts in sampling. Sampling types. Probability sampling methods: simple random sampling, stratified sampling, cluster and systematic. Determination of a sample size.

### ***UNIT 6: Designing diets by linear programming (LP)***

#### ***(Nº of approximate hours: 7)***

Approach of a P.L. problem. Characteristics of a solution to the PL problem. Graphical method. Introduction to the simplex method. Design of optimal diets.



## PRACTICAL SYLLABUS

*Practices completed by Computer*

**Practice 1.** Descriptive analysis of data.

**Practice 2.** Introduction to hypothesis testing. Contrasts on the parameters of a Normal distribution.

**Practice 3.** Independence contrast between qualitative variables.

## READING

### FUNDAMENTAL BIBLIOGRAPHY:

- Canavos G. C. (2003): Probabilidad y Estadística. Aplicaciones y Métodos. McGraw-Hill, Madrid.
- Martín-Andrés A. y Luna del Castillo J.D. (2004): Bioestadística para las ciencias de la Salud. Norma, Madrid.
- Milton J.S. (2007): Estadística para Biología y Ciencias de la Salud. 3ª edición ampliada. McGraw-Hill Interamericana, Madrid.
- Ocaña, F.M. (2014): Manual de Estadística Aplicada. 2ª edición. Ediciones Sider, Granada
- Rius F. y Barón F.J. (2005): Bioestadística. Thomson, Madrid.
- Spiegel M.R.; Schiller J. y Alu R. (2009): Probabilidad y Estadística (3ª edición). McGraw-Hill Interamericana, México DF.
- Valderrama M.J. (2011): Biometría. Ediciones Sider, Granada. (Capítulo VI)

## RECOMMENDED INTERNET LINKS

Web asignatura:

<http://www.ugr.es/~fmocan/estadistica.html>

Blog de Francisco M. Ocaña y Román Salmerón:

<http://www.estadisticaportodaspartes.blogspot.com/es/>

Sociedades y Federaciones relacionadas con la Nutrición y Dietética:

Sociedad Española de Nutrición: <http://www.sennutricion.org/>

Sociedad Española de Dietética y Ciencias de la Alimentación:

<http://www.nutricion.org/> Sociedad Española de Nutrición Básica y Aplicada:

<http://www.senba.es>

Sociedad Española para el Estudio de la Obesidad: <http://www.seedo.es/>



Federación Española de Sociedades de Nutrición, Alimentación y Dietética:

<http://www.fesnad.org/> Otros enlaces:

Web con contenidos de programación lineal: <http://www.phpsimplex.com> Web del Instituto Nacional de Estadística: <http://www.ine.es/>

#### **TEACHING METHODOLOGY**

In the theoretical and practical sessions, the teacher developed the program using the following resources: presentations, blackboard, problem solving, discussion of solved problems.

From actual data, in practical classes, the teacher will develop some contents of the program, or complete any of the theoretical explanations by spreadsheet or statistical package

