

## ***Syllabus of the course “Applied Statistics”***

### **I. GENERAL INFORMATION**

- ✓ **Name of the subject:** Applied Statistics
- ✓ **Code:** 101197
- ✓ **Degree/study:** Degree in Tourism
- ✓ **Academic year:** 2016-2017
- ✓ **Type of course:** Basic training
- ✓ **ECTS credits:** 6 ECTS (150 hours)
- ✓ **Period of teaching:** 2nd Semester
- ✓ **Language of teaching:** English
- ✓ **Teaching staff:** Mónica Oviedo

### **II. INTRODUCTION**

This course aims to provide basic statistical tools intended to serve students and professionals in the field of tourism. After studying this course, students should be able to manage fundamental statistical concepts, procedures and applications, as well as adopt them in order to explore and understand different sort of data in the tourism and hospitality industry. In addition, at the end of the course students should be able to use statistical data to contextualise and further develop their knowledge from other subjects of the curriculum.

This course provides an introduction to statistical thinking and understanding mainly based on practical applications avoiding mathematical demonstrations that would add an unnecessary degree for the goals of the subject. However, it requires a minimum of mathematical knowledge in order to facilitate a successful teaching process.

This syllabus should be read as a contract which establishes rights and duties for both teacher and students, and must be respected by both parties. Any change in the conditions of this syllabus would be determined by the dynamic of the particular group and will be notify with enough anticipation through the Virtual Campus.

### **III. OBJECTIVES, COMPETENCES AND LEARNING OUTCOMES**

#### **OBJECTIVES**

At the end of the course, students will be able to:

- Use properly the vocabulary of Statistics.
- Identify which types of variables are suitable for the quantitative analysis of tourism.
- Collect, analyse and represent quantitative and qualitative information in the tourism and hospitality industry.

- Analyse data, populations and samples, as well as the association between variables in order to assess the economic dimension of tourism.
- Know the main concepts and parameters of descriptive Statistics and establish criteria for presenting data at analytical and graphical level.
- Identify tourism-related variables characterized by randomness and analyse them using basic probabilistic techniques.
- Implement statistical inference using hypotheses testing and estimation.
- Perform time series analysis and forecasting of key tourism variables.
- Establish the advantages and disadvantages of different statistic methods for a given kind of observations.
- Identify key sources of quantitative data in tourism and hospitality (e.g. publications, surveys, etc.) and know how to use them.

#### **OUTCOMES AND COMPETENCES TO BE ATTAINED**

CE15 Assess the economic dimension of tourism at different scales and analyse their relationship.

CE15.2. Analyse data, populations and samples, tables and graphics as well as the relationship amongst variables to assess the economic dimension of tourism.

CE15.3. Collect, analyse and represent quantitative and qualitative information regarding the tourism sector.

CE15.4. Identify situations concerning the tourism sector characterised by their randomness and analyse them using basic probabilistic tools.

#### **IV. TRANSVERSAL SKILLS**

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This course contributes to develop abilities to:

- Manage information and make deductive analyses.
- Describe situations, analyse and interpret particular facts and a diverse type of sources (texts, web sites, etc.).
- Manage properly the process of collecting, sorting and organising data (written or verbal).
- Manage and analyse data, as well as interpret them and present results based on them with technical accuracy and responsibility.
- Take advantage of the learning potential of assessment activities and be constantly engaged in the learning process.
- Manage time properly.
- Develop interpersonal relationships and teamwork skills.
- Show ethical values as student and professional.

#### **V. TOPICS AND CONTENTS**

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##### **TOPIC 1. INTRODUCTION TO STATISTICS (2 hours)**

Basic Concepts in Statistics. Organizing and presenting data: Tables and frequency distribution and graphic representations.

**TOPIC 2. MEASURES OF CENTRAL TENDENCY (4 hours)**

Concepts of mean, median, mode, quintiles. Relationship between measures.  
Procedures and applications.

**TOPIC 3. MEASURES OF DISPERSION (4 hours)**

Range, interquartile range, deviation, variance, standard deviation and coefficient of variation.

**TOPIC 4. FREQUENCY DISTRIBUTION (4 hours)**

Theoretical frequency distribution of a variable. Measures of concentration and inequalities: asymmetry and kurtosis. Normal distributions.

**TOPIC 5. SERIES OF TWO VARIABLES (4 hours)**

Definition and graphical representation. Central tendency. Statistical dispersion. Covariance.

**TOPIC 6. STATISTICAL DEPENDENCE. CORRELATION (4 hours)**

Correlation: concept, procedure and application. Pearson's correlation coefficient. Fitting linear regressions amongst two variables. Least squares approach.

**TOPIC 7. TIME SERIES (4 hours)**

Definition and graphical representation. Components of time series. Seasonal variation. Seasonal Indices. Seasonal adjustment.

**TOPIC 8. A DESCRIPTIVE ANALYSIS OF TIME SERIES (4 hours)**

Index numbers. Complex index numbers with and without weights. Paasche, Laspeyres and Fisher indices. Link and changes of base periods. Deflation of economic series.

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**VI. RECOMMENDED READINGS**

Buglear, J. (2010). *Stats means business- Statistics with Excel for business, hospitality & tourism* (2nd ed.). New York: Elsevier.

Davis, G., & Pecar, B. (2009). *Business Statistics using Excel* (2<sup>nd</sup> ed.). Oxford University Press.

Good, P. I., & Hardin, J. W. (2012). *Common errors in statistics (and how to avoid them)*. [Hoboken, N.J.] : John Wiley.

Newbold, P., Carlson, W. L., & Thorne, B. (2013). *Statistics for business and economics*. Harlow, Essex : Pearson Education.

Ross, S. M. (2010). *Introductory statistics*. Amsterdam [etc.]: Elsevier : Academic Press.

Rugg, G. (2007). *Using statistics: a gentle introduction*. Maidenhead : McGraw-Hill.

UNWTO (2010) *International Recommendations for Tourism Statistics 2008*, Statistics and Tourism Satellite Account, World Tourism Organization, New York. [Available [online](#)]

UNWTO (2015) *Methodological Notes to the Tourism Statistics Database 2015*, World Tourism Organization, Madrid. [Available [online](#)]

## **VII. METHODOLOGY**

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The course has three methods of teaching and learning:

**a) Theory sessions**

During the lectures the concepts will be explained in a theoretical way and exemplified with practical applications. Some sessions will require student's participation to solve problems.

**b) Practice sessions**

During these sessions, topics covered in the theory sessions will be reviewed through exercises, group projects and individual tests that will be undertaken throughout the course. Tourism-related case studies will be presented and specific variables of this industry will be analysed. Students will receive guidance from the instructor in carrying out a project involving the use of statistical and computer skills. Specialised software will be used as much as possible during the sessions.

**c) Self-learning**

The Virtual Campus will be used as a complement and as an alternative means of communication between students and their instructor. All the relevant material of the course, examples and exercises will be attached here online.

Each student should manage their time to study and solve problems proposed in addition to work on a research project using statistical data in the tourism sector to be presented at the end of the course.

## **VIII. EVALUATION**

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Students may choose between a continuous assessment and direct access to the final examination (a unique final evaluation).

**Continuous assessment**

- a) Individual and group exercises developed throughout the quarter. This represents 20% of the final mark.
- b) Group work with a public presentation in the classroom which will be worth 20% of the final mark.
- c) Two individual tests based on theory and exercises, which will be worth 60% of the final mark.

To get the final mark, an average of at least 4 out of 10 must be reached in each part being evaluated.



### **Unique final evaluation**

Students will be examined on all the topics taught in class and the result of this exam will count for a 100% of the final mark.

### **IX. STUDENT'S DEDICATION TIME**

Training activities	Activity	Hours	ECTS	Learning goals
Oriented activities	Theory sessions	43	1.78	CE15.2, CE15.4
	Solving cases	15	0.6	CE15.3, CE15.4
	Public presentations	2	0.08	CE15.2, CE15.3
Supervised activities	Tutorship	20	0.8	CE15.2, CE15.3, CE15.4
Autonomous activities	Solving cases	20	0.8	CE15.2, CE15.3,
	Research	25	1	CE15.2, CE15.3
	Studying	25	1	CE15.2, CE15.3, CE15.4
<b>TOTAL</b>		<b>150</b>	<b>6</b>	

### **IX. SCHEDULE AND CONTENTS**

WEEK	TOPIC	METHOD	Hours
1	TOPIC 1: ORGANIZING AND PRESENTING DATA  Introduction and concepts. Concepts related to Statistics. Random sample. Types of sampling. Different scenarios of quantitative analysis in tourism: spatial, seasonal, individual, aggregates.  Variables and indicators of social, economic and environmental aspects of tourism. Presentation of data: Distribution of frequency tables. Graphics. Primary and secondary sources of information.	-Theory session with ICT support.  - Theory session and discussion -Exercises and discussion of results.	4
2	TOPIC 2: MEASURES OF CENTRAL TENDENCY  Concept, procedure and application: Mean Mode  Median	-Theory session with ICT support.  - Theory session with discussion.  -Exercises and discussion of	4



	Relationship between measures. Concept, procedure and application of quantiles.	results. - Additional lectures.	
3	TOPIC 3: MESURES OF DISPERSION Concept, procedure and application: Range and interquartile range. Concept, procedure and application of measures of dispersion: Variance, Standard deviation and coefficient of variation.	- Theory session with ICT support. - Theory session with discussion. - Exercises and discussion of results. - Additional lectures.	4
4	TOPIC 4: DISTRIBUTIONS OF FREQUENCIES OF A VARIABLE. MEASURES OF ASYMETRY AND KURTOSIS. Normal Distribution.	- Theory session with ICT support. - Theory session with discussion.	4
	Concept, procedure and application of measures of asymmetry. Concept, procedure and application of kurtosis.	- Exercises and discussion of results. - Test on Topics 1,2,3 & 4.	
5	TOPIC 5: SERIES WITH TWO VARIABLES. Definition and graphics. Marginal Distributions. Conditional Distributions. Functional and statistic dependency. Procedure and application of measures of central tendency and dispersion in two-dimensional series. Concept, procedure and application of covariance.	- Theory session with ICT support. - Theory session with discussion. - Exercises and discussion of results.	4
6	TOPIC 6: MEASURES OF STATISTIC DEPENDANCE. ANALYSIS OF CORRELATION. LINEAR REGRESSION. Fitness amongst two variables. Least square method. Concept of Correlation. Concept, procedure and application of residuals.	- Theory session with ICT support. - Theory session with discussion. - Exercises and discussion of results.	4
7	TOPIC 6: MEASURES OF STATISTIC DEPENDANCE. ANALYSIS OF CORRELATION. LINEAR REGRESSION. Fitness amongst two variables. Least square method. Concept of Correlation. Concept, procedure and application of residuals.	- Theory session with ICT support. - Theory session with discussion. - Exercises and discussion of results. - Additional lectures.	4

	Concept, procedure and application of coefficient of determination and coefficient of correlation.		
8	TOPIC 7: TIME SERIES ANALYSIS. Definition and graphics. Elements of a time series. Tendency. Moving average method.	- Theory session with ICT support. - Theory session with discussion. - Exercises and discussion of results.	4
	Linear trend method. Forecasting with least square method. Forecasting issues in tourism.	results.	
9	TOPIC 7: TIME SERIES ANALYSIS (Cont.) Seasonal variation. Seasonal indices. Seasonal adjustment.	- Theory session with ICT support. - Theory session with discussion. - Exercises and discussion of results.	4
10	TOPIC 8: TIME SERIES DESCRIPTIVE ANALYSIS. Concept and applications. Simple index numbers. Complex index numbers with weights. Laspeyres, Paasche and Fisher. Base periods. Deflation. Concept of current or nominal. Concept of constant or real.	- Exercises and discussion of results. - Additional lectures. - Test on Topics 5 to 10.	4
11	PUBLIC PRESENTATIONS.	- Presentations of research work (in groups) related with tourism sector.	4
12	PUBLIC PRESENTATIONS.	- Presentations of research work (in groups) related with tourism sector.	4
13	PUBLIC PRESENTATIONS	- Presentations of research work (in groups) related with tourism sector. - Final Exam.	4

## XI. ENTREPRENEURSHIP AND INNOVATION

In this course, entrepreneurship is focused toward the treatment of data. Information and data analysis of key variables are key determinants for the tourism sector and its future growth.