Syllabus (Pla Docent) : Data Analysis

Teaching guide
Activities schedule

1 Teaching guide

1.1 Course description

Academic course	2012-2013
Name of the course	Data analysis
Code	20640
Course type	Compulsory
Degree	International Business Economics
Credits	
ECTS	5
Work load for students	109 hours
Year	First
Type	Quarter
Period	First quarter
Coordination	Walter García-Fontes
Department	Economics and Business
Teaching staff	Walter García-Fontes Libertad González Eva Ventura David Altimira Teaching assistants
Grups	Business Administration and Management (2) Economics (2) Business Administration (2) International Business Economics (1)
Languages	Catalan, English and Spanish
Schedule	
Lectures	Wednesday
Seminars	Thursdays and Fridays

1.2 Introduction to the course

Data Analysis is a course centered in the collection, organization and descriptive analysis of statistical data.

This course is also often called Descriptive Statistics. This is the most basic course in Statistics, but establishes the basis for all the statistical knowledge, and therefore it is a very important course. The acquired competences, though, apart from being useful for the future, are also instrumental for everyday use in all courses. Furthermore statistics is used in a lot of other contexts, such as the media or the administration, and probably every person knows statistics without having taken a specific statistics course.

This is a practical course where statistics is approached from an intuitive point of view, without the use of mathematical tools.

The course not only introduces the concepts and techniques related to descriptive statistics, but also practices the use of the computer for data analysis.

In short, this is a course where the basic concepts of descriptive statistics are learnt and where these concepts are worked out through practical cases and applied to the analysis of various datasets with the help of the computer.

1.2.1 Requirements for the learning process

The course contains all the elements to be followed, and does not presuppose any previous knowledge in statistics.

No previous mathematical knowledge are required either, except for basic mathematics needed with the most elemental algebraic operations, as well as known formulae manipulation, especially with the inclusion of summations.

The course uses the computer intensively as a tool to support the analysis and interpretation of statistical data. It is supposed that students have previous experience in computing environments, despite the fact that its use for data organization and analysis will be practiced and therefore there are no previous requirements in computing.

1.2.2 Value added for students

This is a basic course to get the necessary competences to support decision taking with the use of facts and data about the economic environment. It is part, therefore, of the sequence of courses that work out the instrumental competences of statistical analysis of real phenomena.

Data Analysis is the first course in statistics. This is complemented later with courses that provide the mathematical fundamentals of statistics, as well as other courses specific to business management and economics.

1.3 Course Competences

These are the competences that are worked out in the course:

Competence type	Evaluation weight
General/Transversal	
1. Oral and written communication competences	2%
2. Analysis and synthesis abilities	1%
3. Team work abilities	1%
4. Learning by using and experience	1%
5. Application of theoretical knowledge and analysis tools to real situations	1%
6. Abilities to work autonomously	1%
Specific	
7. Knowledge about numerical and graphical descriptive and data analysis techniques	10%
8. Application of numerical and graphical descriptive and data analysis techniques	10%
9. Use of basic computing techniques	7%
10. Abilities to use the computer to apply the basic numerical and graphical techniques	9%
11. Abilities to apply statistical techniques for problem solving	40%
12. Abilities for searching appropriate sources and data selection for the course project	1%
13. Abilities to communicate to non-expert people professional reports with the use of statistical data	1%

1.4 Evaluation

The highest marks possible is 100, to be obtained according to various continuously evaluated activities and a final evaluation. Both the continuous and final evaluation will test the competences acquired during the course.

1.4.1 Evaluation Type

Continuous evaluation

Weekly completion of tasks: Each week an independent work guide and quiz are assigned and are used to practice some of the concepts introduced in class. 5 points can be earned by the successful completion of these tasks.

Weekly tests: Weekly tests will be administered both during lectures (20 points can be earned) and during seminars (20 points can be earned), accounting for 40 points of the final grade. Tests in seminars evaluate mainly competences in the use of computer tools for data analysis which can be only evaluated in seminars, therefore they cannot be substituted by any other activity. Tests in lecture evaluate the continuous learning process during the course, and are similar to the questions to be found in the final exam, therefore they are complementary to the final exam.

The lowest grade of the tests in seminars, either because of low performance or absence, will be discarded.

Team project: This is part of the continuous evaluation. A team project has to be developed and 15 points can be earned. The team project consists of the analysis of a consumption product chosen by the team and the use

of statistical information to introduce an alternative product into the same market.

Final Evaluation A final exam is written at the end of the quarter where 40 points can be earned.

If all lecture tests have been taken, the grades in lecture tests will be taken into account only if they improve the average with the final exam, otherwise the final exam will count 60 points.

The test will have eight practical questions and its duration is two hours.

A make-up exam for the final evaluation will be administered at the beginning of the second term. This make-up exam substitutes the final exam, in other words the grade attained in this exam will be taken into account instead of the grade of the final exam. Only students having failed the course can write this make-up exam.

Evaluation for students repeating the course Students who repeat the course, that is students who have already taken the course but have failed it, can choose between the following two evaluation procedures:

1. They are evaluated the same way as the students that are taking the course for the first time: they participate in all activities to obtain the continuous and final evaluation.

2. They are evaluated with 4 problem lists which count 30% of the grade, and the final exam which counts 70%.

Only students repeating the course at least once and having attended a minimum of 80% of the activities (semi-

nar tests, lecture tests, final exam) of the failed course can opt for the second procedure.

1.4.2 Criteria to earn the course credits

To earn the credits in the course a minimum of 60 points have to be obtained.

This is a summary table of the evaluation criteria:

Activity evaluation		
Final evaluation	Final exam	**40 points** of the final grade (or 60 points of the grades of the lecture tests do not improve the average with the final exam)
Continuous Evaluation	Continuous evaluation tests	
	Weekly task assignments	5 points of the final grade
	Lecture tests	**20 points** of the final grade (only taken into account if they raise the final grade)
	Seminar tests	**20 points** of the final grade
	Team project	15 points of the final grade
Total points to be earned		100 punts (A minimum of 60 points are needed)

The final grade to be entered in the academic transcript corresponds to the one shown in the following equivalence table:

Course Grade	Transcript Grade			Course Grade	Transcript Grade			Course Grade	Transcript Grade			Course Grade	Transcript Grade
0	0												
1	0.1			26	2.1			51	4.2			76	7
2	0.2			27	2.2			52	4.3			77	7.1
3	0.2			28	2.3			53	4.4			78	7.3
4	0.3			29	2.3			54	4.4			79	7.4
5	0.4			30	2.4			55	4.5			80	7.5
6	0.5			31	2.5			56	4.6			81	7.7
7	0.6			32	2.6			57	4.7			82	7.8
8	0.7			33	2.7			58	4.8			83	1.9
9	0.7			34	2.8			59	4.9			84	8
10	0.8			35	2.8			60	5			85	8.1
11	0.9			36	2.9			61	5.1			86	8.3
12	1			37	3			62	5.3			87	8.4
13	1.1			38	3.1			63	5.4			88	8.5
14	1.1			39	3.2			64	5.5			89	8.6
15	1.2			40	3.2			65	5.6			90	8.8
16	1.3			41	3.3			66	5.8			91	8.9
17	1.4			42	3.4			67	5.9			92	9
18	1.5			43	3.5			68	6			93	9.1
19	1.6			44	3.6			69	6.1			94	9.3
20	1.6			45	3.7			70	6.3			95	9.4
21	1.7			46	3.7			71	6.4			96	9.5
22	1.8			47	3.8			72	6.5			97	9.6
23	1.9			48	3.9			73	6.6			98	9.8
24	2			49	4			74	6.8			99	9.9
25	2			50	4.1			75	6.9			100	10

1.5 Methodology

1.5.1 Course organization

These are the different activities during the course:

1. 8 sessions in large lecture group for the introduction of concepts and its basic applications.
2. 6 sessions in seminar group to practice interactively the different statistical concepts introduced in the course.
3. 8 sessions of autonomous individual work.
4. Autonomous team work and team members interaction.
5. Final exam preparation.
6. Final exam writing

The work load of these different activities is the following:

1. Lectures (2 hours a week during 8 weeks).
2. Seminars (1 hour a week, starting the third week, for 6 weeks)
3. Independent work (suggested time: 4 hours a week)
4. Team work (suggested time: 3 hours a week)
5. Final exam preparation (suggested time: 15 hours before the final exam)
6. Final exam (2 hours)

The following table shows the time that students will dedicate to this course (in average):

	Lecture Group	Seminar Group	Individual Work	Team Work	Exam Study	Exam load	Weekly load
Week 1	2		3				5
Week 2	2		3				5
Week 3	2	1	4	3			10
Week 4	2	1	4	3			10
Week 5	2	1	4	6			13
Week 6	2	1	4	6			13
Week 7	2	1	4	6			13
Week 8	2	1	4	6			13
Exam Preparation					25		25
Final Exam						2	2
Total Hours	16	6	30	30	25	2	109

2 Activities schedule

2.1 Course calendar

Week	Activity	Resources
Week 1		
Lecture 1	Course introduction; What is statistics?	Moore initial section
Week 2		
Lecture 2	Descriptive analysis of data - One variable datasets	Moore pag. 6-51
Seminar 1	Test: OpenOffice Calc use of ODStatistics; Practice case 1	
Week 3		
Lecture 3	Test 1: Week 1 and 2	
	Data tranformation; Numerical summaries of grouped data	Dossier pag. 1-8
Seminar 2	Test: ODStatistics 1NUM; Presentation of team projects	
Week 4		
Lecture 4	Computations with the normal distribution	Moore pag. 51-75
Seminar 3	Test: Grouped data and Transformation with ODStatistics; Practice case 2	
Week 5		
Lecture 5	Analysis with two numerical variables	Moore pag. 97-173

Continued in the next page

Week	Activity	Resources
	Continued from the previous page	
Seminar 4	First team project presentation	
Week 6		
Lecture 6	Test 2: 1 numerical variable and normal distribution	
	Non-linear relations Causality and correlation	
Week 7		
Lecture 7	Two categorical variables	Moore page. 173-203
Seminar 5	Test: two numerical variables and normal distribution Practical case 3	
Week 8		
Lecture 8	Time series	Dossier pag. 42-69
Seminar 6	Final team project Presentation	

2.2 Main events

Each week autonomous guided assignments and quizzes have to be completed.

2.2.1 General activities

Week	Activities
1	Class 1 - Assignment of students to seminars
2	Class 2 - Assignment of students to teams and project choice
3	Class 3 - Test 1 in lecture
4	Class 4
5	Class 5
6	Class 6 - Test 2 in lecture
7	Class 7
8	Class 8

2.2.2 Seminar activities

Seminar	Activities
1	Computer Test 1 - Practical case 1
2	Computer Test 2 - Team project outline presentation
3	Computer Test 3 - Practical case 2
4	First team project presentation
5	Computer Test 4 - Practical case 3
6	Second and final team project presentation

2.3 Teaching resources

1. Textbook: *The Basic practice of statistics*, David S. Moore 2nd ed. , W.H. Freeman, 2000.

2. Data analysis software: ODStatistics, available to download and in all computer rooms at UPF (running under OpenOffice).

3. Theory dossier prepared by the instructors.