

EXP9 BUSINESS STATISTICS (Barcelona) - Syllabus

Winter 2003

First Module: January 28 - February 1

Second Module: March 3 - March 8

Prof. Federico M. Bandi

Prerequisites

None. I will not assume you know any stats.
Some basic math will be needed.

Course Outline

This course is designed to teach the basic statistical concepts and tools needed for business applications and most GSB courses.

The topics covered are: (i) descriptive statistics and plots used to summarize data; (ii) random variables and expectations; (iii) modeling and inference: population and sample quantities, confidence intervals, hypothesis testing and p-values; (iv) linear regression;

Statistical software, such as MINITAB, will be used.

Grading

3 short quizzes, a midterm and a final count either 15% (5% each), 30% and 55% or 15% (5% each), 15% and 70%, respectively, towards the final grade. The maximum between these two grades will be used to compute your final letter grade. You will be graded on a curve.

The daily (group) assignments and the two (individual) end-of-module assignments will count only for students with borderline grades.

The first module: Tuesday, January 28 - Saturday, February 1

Tuesday	Wednesday	Thursday	Friday	Saturday
Lecture 9-12:20	Lecture 9-12:20	Lecture 9-12:20	Lecture 9-12:20	Lecture 9-12:20
How to use Minitab 1:15-2:15	Review on Minitab 1:15-2:15		Quiz 1:15-1:30 Review 1:30-2:15	Quiz 1:15-1:30 Review 1:30-2:15
Satadru	Satadru		Satadru	Satadru

The second module: Sunday, March 2 - Saturday, March 8

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Midterm 9-10:30	Lecture 9-12:20	Lecture 9-12:20	Lecture 9-12:20	Lecture 9-12:20	Lecture 9-12:20
Pre- Midterm Review Time: TBA		Review 1:15- 2:15	Review 1:15- 2:15		Quiz 1:15- 1:30 Review 1:30- 2:15	Pre- Final Review 1:15- 2:15
Satadru		Satadru	Satadru		Satadru	Satadru

The three quizzes

The quizzes will take place on the Friday and Saturday of the first week and on the Friday of the second week between 1:15 pm and 1:30 pm. The quizzes will be written and closed-books. A one-sided cheat sheet will be allowed.

The midterm

The midterm will take place on March 3 at 9 am. The allotted time will be about 1 hour and 30 minutes. The exam will be written and closed-books. A one-sided cheat-sheet will be allowed.

The final

The final will take place on April 7 at 9 am. The allotted time will be 3 hours. The exam will be written and closed-books. A two-sided cheat-sheet will be allowed.

Please bring a calculator to all exams.

All requests for re-grading of exams must be made in writing and state clearly the basis of the request.

All requests for re-grading must be submitted within 7 days of the return of the exam.

Clerical errors will be corrected at no risk to the student. All other re-grading requests will result in the re-grading of the entire exam. Downward as well as upward revisions of a grade are possible.

The short (group) assignments

Several practice problems will be assigned daily during the two modules. Contrary to the two (individual) end-of-module problem sets, these problems must be solved in groups. Each study group should work on the assignment as a team and turn in a group write-up the next day in class. The TA, Satadru Hore, will be available during the evening group work sessions to answer questions and help with the assignments. You will receive credit for each assignment that is turned in on time. Initially, the assignments will not be graded or returned. However, performance on the assignments will be used to determine final grades for those students who are on the border between consecutive grades. Solutions to these problems will be given the next day in class. The short (group) assignments are the best preparation for the quizzes.

The (individual) end-of-module assignments

The two end-of-module problem sets will be assigned at the end of each module and will be due on the day of the exams (midterm and final) in class. Solutions for these assignments will be provided immediately. Nonetheless, you are highly encouraged to attempt the problems before reading the solutions.

As in the case of the group assignments, initially the individual assignments will not be graded or returned. However, performance on the assignments will be used to determine final grades for those students who are on the border between consecutive grades.

Together with the practice midterms and finals that will be provided during the course and the short group assignments, the individual end-of-module assignments are the best preparation for the midterm and the final exam.

Text and References

There is no required text aside from a complete set of lecture notes which is available in the course packet. Additional notes will be handed out.

The statistical software MINITAB is required.

Statistics for Business and Economics by Newbold et al. (Prentice) is a good reference that I thought you might want to have on your shelves in case you wish to have an additional perspective on some of the topics that I will cover in class. This text is optional.

The Cartoon guide to statistics by Gonick and Smith (Harper) is a nice supplement to the lecture notes for some of the topics covered in this course. This text is also optional.

You will only be tested on the material in the course packet.

How to contact me

Barcelona

I have an office on the second floor. I will give you my phone number as soon as possible.

Chicago

E-mail: Federico.bandi@gsb.uchicago.edu

This is the easiest way to make contact with me.

Phone: (773) 834-4352

I have voice mail. Leave me a message if I am not in my office.

How to contact the TA, Satadru Hore

Barcelona

Satadru has an office on the second floor. I will give you his phone number as soon as possible.

Satadru will give the review sessions and will be available in the afternoon (after your managerial accounting class) to answer questions and give you assistance with the assignments.

Please give him some advance notice if you wish to meet with him in the afternoon before the end of your managerial accounting class.

Chicago

E-mail: pshore@gsbphd.uchicago.edu

EXP9 Business Statistics (Barcelona)
... in more detail

1. Summarizing data

- 1.1 Graphical summaries of the data
 - Dot plot and histogram
 - The time series plot
- 1.2 Numerical descriptive measures
- 1.3 Measures of central tendency
 - The sample mean
 - The median
 - Mean versus median
- 1.4 Measures of dispersion
 - The sample variance
 - The sample standard deviation
- 1.5 The empirical rule
- 1.6 How to relate two things
- 1.7 Linearly related variables
 - Linear functions
 - Mean and variance of a linear function
 - Linear combinations
 - Mean and variance of a linear combination

2. Discrete random variables

- 2.1 Probability and random variables
- 2.2 Bivariate random variables
- 2.3 The marginal distribution
- 2.4 The conditional distribution
- 2.5 Independence
- 2.6 Computing joints from conditionals and marginals
- 2.7 IID random variables
- 2.8 Random variables and formulae
- 2.9 The binomial distribution
- 2.10 A non-IID Model, the random walk

3. Continuous random variables

- 3.1 Continuous random variables, the p.d.f.
- 3.2 The normal family of distributions
- 3.3 The cdf
- 3.4 IID draws from the normal distribution
- 3.5 The histogram and IID draws
- 3.6 The normal distribution and data
- 3.7 Standardization

4. Numerical summaries for random variables

- 4.1 Expected value of a discrete random variable
- 4.2 Variance of a discrete random variable
- 4.3 Expected value as long run average
- 4.4 Theoretical variance as long run sample average
- 4.5 Expected value and variance of a continuous RV
- 4.6 Population versus sample quantities
- 4.7 Mean and variance of a linear function
- 4.8 Covariance and correlation for RVs
- 4.9 Mean and variance of a linear combination
- 4.10 The central limit theorem
- 4.11 Combinations of independent normals

5. Estimates and confidence intervals

- 5.1 Estimating a normal mean
- 5.2 The distribution of the normal sample mean
- 5.3 Normal data, confidence interval for μ , σ known
- 5.4 Normal data, confidence interval for μ , σ unknown (the t-distribution)
- 5.5 Bernoulli data, confidence interval for p
- 5.6 The central limit theorem and a general approximate confidence interval for μ .
- 5.7 Summary
- 5.8 Prediction with IID normal data

6. Hypothesis tests and P-values

- 6.1 Hypothesis tests for p
- 6.2 Hypothesis tests for μ
- 6.3 P-values
- 6.4 Confidence intervals and hypothesis tests: the big picture

7. Linear regression

- 7.1 The housing data: given X, what is Y?
- 7.2 The simple linear regression model
- 7.3 Estimates, standard errors, confidence intervals and hypothesis tests
- 7.4 The predictive interval
- 7.5 Plot your data!
- 7.6 The slope and intercept estimates
- 7.7 The multiple linear regression model
- 7.8. A measure of fit: R-squared