

# MA151 Statistics

Seminar Leader: Marius Fahrner  
Course Times: Fridays from 09:00-12:00  
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Office Hours: By appointment

## Course Description

This module is designed to introduce the methodologies proper to the empirical social sciences. The course surveys the basics of descriptive and inferential statistics, conditional, joint and marginal probability, discrete and continuous random variables, distributions of sample statistics, confidence intervals, estimators, hypothesis testing as well as regression analysis.

The course should help you achieve the following goals:

- \* Mastery of basic concepts of probability theory and statistics
- \* Capacity to understand simple statistical tests and concepts of statistical inference
- \* Capacity to complete statistical exercises relevant to economics
- \* Knowledge of the basics of simple regression analysis

## Textbooks

For this course we will use *Statistics for Business and Economics* (Seventh edition), P. Newbold, W. L. Carlson and B. Thorne, 2010, Pearson.

## Attendance

Attendance at ALL classes is expected. More than two absences (that is absences from two sessions of 90 minutes) in a semester will significantly affect the grade for the course.

## Assessment

Assessment will be based on attendance, preparation for classes, regular and active participation, homework, as well as a mid-term and a final examination.

## Policy on late submission of exercises

Exercises that are up to 24 hours late will be downgraded one full grade (from B+ to C+, for example). After that, the student will receive a failing grade for the assignment.

## Grade Breakdown

Participation 10%  
Mid-term exam 30%  
Homework 30%  
Final examination 30%

## Schedule

The schedule provided is provisional in order to allow for flexibility. It is the students' responsibility to keep themselves informed of any changes to the schedule provided here. An up-to-date schedule will

be maintained by the seminar leader in our Google classroom system.

Scheduled class times are available online under the relevant course heading:

<http://www.berlin.bard.edu/academics/courses/spring-2017/>

Week 1 – Introduction, using graphs to describe data, measures of central tendency

Feb 03

Reading: Newbold/Carlson/Thorne, ch.1 and 2.1

Week 2 – Variance, standard deviation, covariance, correlation

Feb 10

Reading: Newbold/Carlson/Thorne. ch. 2.2 and ch.2.4

Week 3 – Permutations, combinations, random experiment, outcome and events

Feb 17

Reading: Newbold/Carlson/Thorne , ch. 3.1

Week 4 – Introduction to probability theory, probability rules

Feb 24

Reading: Newbold/Carlson/Thorne , ch. 3.2 and ch.3.3

Week 5 – Bivariate probabilities, theorem of Bayes

Mar 03

Reading: Newbold/Carlson/Thorne, ch. 3.4 and ch. 3.5

Week 6 – Midterm, Introduction to discrete random variables, probability distributions for discrete random variables

Mar 10 (midterm)

Reading: Newbold/Carlson/Thorne, ch. 4.1 and ch. 4.2

Week 7 – Properties of discrete random variables, binomial distribution, Poisson distribution

Mar 17

Reading Newbold/Carlson/Thorne:, ch. 4.3, ch. 4.4 and 4.6

Week 8 – Introduction to continuous random variables, the uniform distribution, mean, variance and standard deviation for continuous random variables

Mar 24

Reading: Newbold/Carlson/Thorne , ch. 5.1 and 5.2

Week 9 – The normal distribution, the exponential distribution and jointly distributed continuous random variables

Mar 31

Reading Newbold/Carlson/Thorne:, ch. 5.3 and 5.5

Week 10 – Sampling from a population, sampling distributions from sample means

Apr 07

Reading: Newbold/Carlson/Thorne , ch. 6.1 and 6.2

Week 11 – Central limit theorem, law of large numbers, point estimators

Apr 21

Reading: Newbold/Carlson/Thorne, ch. 7.1

Week 12 – Confidence intervals, introduction to hypothesis testing

Apr 28

Reading: Newbold/Carlson/Thorne, ch. 7.2, ch.7.3 and ch.9.1

Week 13 – Hypothesis test for population mean, introduction to two variable regression analysis

May 05

Reading Newbold/Carlson/Thorne:, ch. 9.2, 9.3 and 11.1

Week 14 – Regression model, least squares coefficient estimators; Review

May 12

Reading: Newbold/Carlson/Thorne, ch. 11.2 and 11.3

Week 15/16 – Completion Week (FINAL EXAM on May 19)

*Classes missed due to federal holidays will not be rescheduled.*

### **Problem sets deadline**

Problem sets are due before class one week after being given.

(version: 02.12.2016)