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Department of Mathematical Sciences  
ELIZABETHTOWN COLLEGE

Office hours: Mo,We,Fr 12:30-1:50pm,  
Tu,Th 2:00-3:20pm.

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web page for the course: <http://users.etown.edu/d/doytchinovb/ma252/>

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## SYLLABUS

**TEXT.** David Moore, George P. McCabe, Layth Alwan and Bruce Craig, *The Practice of Statistics for Business and Economics*, (3rd edition) W.H.Freeman, ISBN: 978-1429242530.

You *do not need* the CD or access codes that come with the book. We will not be using StatsPortal. All the necessary electronic files will be made available to you on BlackBoard.

**CALCULATOR.** You are expected to have a calculator capable of statistical calculations; it should be brought to class each day and to exams and tests. A graphing calculator is highly recommended. Some class demonstrations will be done using the Voyage 200 and/or the TI-84, but you can use any calculator you feel familiar with.

**PREREQUISITES.** MA251 Probability and Statistics, familiarity with SPSS or other statistical software.

**COURSE GOALS and COVERAGE.** This course is a second course in Calculus-based Statistics. It focuses on the study of statistical techniques for analyzing a variety of problems from the physical and life sciences, as well as business, economics, and the social sciences. The goal of this course is to teach you various statistical methods, how and when they can be applied, how to use standard statistical software to perform statistical analysis, and how to intelligently interpret the results of the statistical calculations.

The course will cover most of the material in chapters 6 to 17 of the textbook, omitting chapter 12. For a detailed list of topics, see the schedule on the last page of this syllabus. Please be advised that chapters 15, 16, and 17 are not printed in the book; they will be made available to you electronically.

**STUDENT LEARNING OUTCOMES.** By the end of the semester you will be able to:

- compare, estimate, and draw inferences about statistical parameters, based on one, two, or more random samples;
- formulate and test statistical hypotheses;
- perform categorical data analysis by means of the appropriate chi-square tests;
- use regression analysis as a major tool for modeling phenomena;
- implement design of experiments and apply analysis of variance;
- analyze time series and use them for the modeling and forecasting of physical, financial, and socioeconomic processes;
- apply appropriate nonparametric procedures for analyzing data whose distribution is not normal;
- become proficient with statistical computer software (SPSS or other) at a level that enables you to to conduct sound statistical research;
- pursue and complete a research project that requires group work, data acquisition, statistical analysis, and oral and written presentation;
- demonstrate the ability to work cooperatively with others;
- communicate the results of inductive quantitative analysis effectively, both orally and in writing.

**ASSESSMENT.** Your final grade for the course will be based on the degree of mastery of the learning outcomes listed above, as measured by your performance in class, and on homework assignments, tests, the group research project, and the final exam.

**ATTENDANCE.** You are supposed to attend all lectures. Excessive absence will hurt your grade. If you miss a class, it is your responsibility to make a copy of the classnotes from another student and make sure you learn what you have missed.

You should come to class prepared to discuss homework, ask questions, and share solutions. Some homework problems might be discussed briefly in class. If all your questions are not addressed during this time, do not hesitate to seek additional help (e.g., office hours).

This is a 4-credit course. This means that you are expected to spend 12 hours per week on it. Of these, you will be spending 4 hours per week in class: three lectures, 80 minutes each. The other 8 hours must be devoted to studying on your own: reading the book, reading and organizing your notes, writing homework, solving additional problems, working on your project, using the statistical software in the computer labs.

Absence on any occasion of evaluation (tests and exams) will result in a grade of zero for that evaluation. The only exceptions will be prior approval and written documentation. If some unavoidable circumstance comes up that will prevent you from taking an exam or test as scheduled, you must talk to me about this personally (face to face or on the telephone) and in advance.

**HOMEWORK.** Homework will be assigned at almost every lecture, and will be collected at the beginning of the following lecture (see the attached schedule for details). No late work will be accepted. You are encouraged to discuss homework problems with each other, but not to copy them from each other. The final write-up must be your own. Presenting the results of someone else's work as yours is a clear violation of academic integrity and will be treated as such. Homework accounts for 10% of your grade.

The problems on the tests and the final exam will be similar to the ones discussed in class or assigned as homework. Discipline yourself to write clear readable notes and solutions, they will be of great value as review.

Of course, the assigned problems should be considered to be a minimum. You should solve more problems, especially if you don't feel quite comfortable with any section.

**GROUP RESEARCH PROJECT.** The class will be divided into groups of 2-3 with each group working as a team that will be responsible for a research project. Each team should function as a cooperative learning group. The group members should share responsibilities and work equally. You can use any statistical software and any methodology from MA 251/252 to analyze the data. You will need to submit a report in electronic form and make a presentation in class. All team members will receive a common grade for their written report, as well as for the presentation. If you miss the presentation of your group, your grade will be lower than the grades of the other members.

Details about the project will be announced in class. The project accounts for 15% of your grade.

**TESTS and EXAMS.** There will be three in-class tests, on the following dates:

MONDAY, FEBRUARY 3

FRIDAY, FEBRUARY 28

MONDAY, APRIL 7

Each test is timed and will take 80 minutes. This time limit will be strictly enforced.

There will be a comprehensive final exam on MONDAY, MAY 5, 2:30 to 5:30pm. This date and time have been set by the registrar's office and cannot be changed. Please make your traveling plans accordingly.

All exams and tests are closed-book. For some of them you will be given formula sheets and statistical tables. No other books or notes of any sort are allowed. You should bring your calculator to the tests and final exam.

**FINAL GRADE.** Your final grade for the course will be calculated in the following way:

55% of the grade come from the three Tests, (15% the lowest, the others 20% each),

20% of the grade come from the Final Exam,

10% of the grade come from the Homework,

15% of the grade come from the project.

These are combined into a number of points, between 0 and 100. The ranges for the final grades are:

A	93-100
A-	90-92.9
B+	87-89.9
B	83-86.9

B-	80-82.9
C+	77-79.9
C	73-76.9
C-	70-72.9

D+	67-69.9
D	63-66.9
D-	60-62.9
F	0-59.9

**INTEGRITY.** All work you submit for grading must be your own and must comply with the Standards of Academic Integrity set forth in the Elizabethtown College Catalog. In particular, no collaboration on tests or exams is allowed.

As stated in the catalog, academic dishonesty — including cheating and plagiarism — constitutes a serious breach of academic integrity. Plagiarism is defined as taking and using the writings or ideas of another without acknowledging the source. Since this course involves the writing of a report, it is important to avoid the pitfall of inadvertent plagiarism. Please document and cite your sources appropriately.

**DISABILITIES:** Elizabethtown College welcomes otherwise qualified students with disabilities to participate in all of its courses, programs, services, and activities.

If you have a documented disability and would like to request accommodations in order to access course material, activities, or requirements, please contact the Director of Disability Services, Lynne Davies, by phone (361-1227) or e-mail [daviesl@etown.edu](mailto:daviesl@etown.edu).

If your documentation meets the colleges documentation guidelines, you will be given a letter from Disability Services for each of your professors. Students experiencing certain documented temporary conditions, such as post-concussive symptoms, may also qualify for temporary academic accommodations and adjustments.

As early as possible in the semester, set up an appointment to meet with me, the instructor, to discuss the academic adjustments specified in your accommodations letter as they pertain to my class.

The following is a tentative schedule. Most of the time we will be following it closely, but occasional deviations are to be expected.

**MA252, Spring 2014**

**SCHEDULE**

Day	Date	Topic	Sections	Homework	Due
Mo	01/13	One-sample estimation	6.1	6.16,6.17,6.21	01/15
We	01/15	Hypotheses testing for mean (known var)	6.2–6.4	6.68,6.77,6.78	01/17
Fr	01/17	One-sample inference for means (unknown var)	7.1	7.38,7.39,7.47	01/22
We	01/22	Two-sample inference for means (indep. samples)	7.2,7.3	7.78,7.79,7.89	01/24
Fr	01/24	Inference for variance	7.3	7.103	01/27
Mo	01/27	Two-sample inference for means (matched pairs)	7.3	7.122,7.128	01/29
We	01/29	Inference for proportions	8.1,8.2	8.45,8.76,8.77	01/31
Fr	01/31	Review			
Mo	02/03	Snow Day (no classes)			
We	02/05	TEST 1			
Fr	02/07	One-way ANOVA (CRD)	14.1	14.47,14.63,14.91	02/10
Mo	02/10	CRD: individual comparisons	14.2		
We	02/12	Comparing means with SPSS	14.1,14.2	14.68,14.69	02/14
Fr	02/14	ANOVA (RBD)	15.1	TBA	02/17
Mo	02/17	ANOVA: full two-factor model	15.2	15.21,15.22,15.25	02/19
We	02/19	ANOVA with SPSS			
Fr	02/21	Chi-square distribution and goodness of fit test	9.1	TBA	02/24
Mo	02/24	Chi-square test for contingency tables	9.1,9.2	9.11,9.12,9.17	02/26
We	02/26	Review			
Fr	02/28	TEST 2			
Mo	03/10	Regression and correlation	10.1		
We	03/12	SLR: fitting the model	10.1–10.3	10.15,10.33,10.34	03/14
Fr	03/14	SLR: residual analysis	10.3	10.75,10.76	03/17
Mo	03/17	SLR: estimation and prediction	10.2,10.3	10.16,10.19,10.78	03/19
We	03/19	Nonlinear models and transformations	10.2	TBA	03/21
Fr	03/21	MLR: fitting the model	11.1,11.2	11.18	03/24
Mo	03/24	MLR: estimation and prediction	11.2	11.42,11.87,11.89	03/26
We	03/26	MLR: residual analysis	11.2		
Fr	03/28	Nominal variables and model building	11.3	11.78,11.81,11.82	03/31
Mo	03/31	Logistic regression	17.1–17.3	17.22,17.23	04/02
We	04/02	Regression with SPSS			
Fr	04/04	Review			
Mo	04/07	TEST 3			
We	04/09	Time series: indexes and tests for randomness	13.1	13.4,13.5	04/11
Fr	04/11	Time series: detrending with linear regression	13.2	13.17,13.18,13.28	04/14
Mo	04/14	AR, MA and ARIMA models	13.3	13.39,13.40,13.41	04/16
We	04/16	Time series: smoothing and forecasting	13.4	13.52,13.53,13.67	04/17
Th	04/17	Non-parametric methods for one and two samples	16.1,16.2	16.12,16.14,16.15	04/23
We	04/23	Non-parametric tests: Kruskal-Wallis, Friedman	16.3	16.27,16.37,16.43	04/25
Fr	04/25	Non-parametrics: Spearman's rank correlation		TBA	04/28
Mo	04/28	Project presentations			
We	04/30	Project presentations			
Fr	05/02	Review			
Mo	05/05	FINAL EXAM (2:30–5:30pm, E270)			