Objectives and Prerequisites

The course focuses on elementary probability and inferential statistical techniques. The course begins with a survey of basic descriptive statistics and data sources and then covers elementary probability theory, sampling, estimation, hypothesis testing, correlation, and regression. The course focuses on practical issues involved in the substantive interpretation of economic data using the techniques of statistical inference. For this reason, empirical case studies that apply the techniques to real-life data are stressed and discussed throughout the course, and students are required to perform several statistical analyses of their own.

Prerequisites: Economics 1 and 2, Mathematics 104 and either 114 or 115.

Note: Students who completed STAT 101 or STAT 101/102, STAT 111 or the 111/112 or ESE 301/302 sequence should enroll in ECON 103 as these courses no longer satisfy the statistics requirements.

Econ 103 satisfies the University's Quantitative Data Analysis requirement.

Lecture and Office Hours

Lecture Hours:
Monday: 2 – 3:30, EDUC 203
Wednesday: 2- 3:30, EDUC 203

Recitations:
203 Friday: 9 – 10, MCNB 110
204 Thursday: 12- 1, EDUC 120

Office Hours (McNeil 343):
Monday: 11– 12
Wednesday: 10-12

Office Hours - Recitation Instructors (to be announced)
Textbook and Other References

Suggested Textbooks
(Note: Penn Bookstore has the latest edition. Copies of the latest edition and older editions are on reserve at Lippincott Library. Older editions maybe used, but make sure to check with the latest edition whenever references are made to chapters, sections, or page numbers)

Required
Registration for MyMathLab/Statlab (similar to MyEconLab or Applia) or coursecompass.com to have access to homework questions. Electronic version of the text is also available on this site. The course number for the site will be given on the first day of classes.

Sources on the web:

Grading

The final grade for the course will be based on weekly homework assignments, quizzes (about one every other week), a midterm exam and a final exam:

Homework assignments (weekly, MyStatLab, no late assignments will be accepted, the lowest grade will be dropped) (10%)
Quizzes (dates to be announced about a week before the quiz) (20%)
Midterm Exam (October 28, Wednesday, 2-3:30, STIT B21) (30%)
Final Exam (scheduled by the Registrar – preliminary, Tuesday, December 15, 6-8pm) (40%)

Students are responsible for making sure, at the beginning of the term, that they can attend the exams. Registering for a course means that you certify that you will be present for the exam. Courses taught in the Department of Economics are covered by a common set of course management policies. Registering for this course means that you will follow these policies.

See, Departmental Policies for Undergraduate Economics Courses (attached to this Syllabus. Please, see the Department web-site for any updates)

The Department has a guideline for the distribution of grades. This guideline will be followed in this course:
00-30% grades: A or A-
40-50% grades: B+, B, or B-
20-30% grades: C+ or below

**Examinations (Midterm, Final, and Quizzes)**

There will be a midterm and a final exam. In addition, there will be quizzes (about two in a 30-day period, 10-20 minutes each, lowest grade of quizzes will be dropped). All examinations are closed book/notes. A formula sheet is not allowed in examinations. A calculator is required for examinations.

Quizzes (date will be announced about a week before the quiz) (20%)
Midterm Exam (October 28, Wednesday, 2-3:30, STIT B21) (30%)
Final Exam (scheduled by the Registrar – preliminary, Tuesday, December 15, 6-8pm) (40%)

See schedule and final exam rules: [http://www.upenn.edu/registrar/pdf_main/09C_Final_Exam_Schedule.pdf](http://www.upenn.edu/registrar/pdf_main/09C_Final_Exam_Schedule.pdf)
Any conflicts regarding exams will be resolved according to University and Departmental Policies.

Any requests for re-grading of exams must be submitted in writing within one week from the date that exams are made available. Please note that the re-grade period begins on the date that the exams are made available and not on the date that you pick up the exam. If you miss the class during which the exams are returned, it is your responsibility to pick up your graded exam within the one-week period. When you request a re-grade, we retain the right to re-grade your entire exam. Do not mark or make notes on your graded exam, and do not alter in any way the answers to the questions. Such alterations will be construed as violations of the Code of Academic Integrity and may be referred for disciplinary action.

**Academic Integrity Issues**

Academic integrity is a very important part of student life, and the Department of Economics takes it seriously. The department reserves the right to undertake procedures that would catch breaches of academic integrity, should any arise, such as photocopying or scanning midterms or other work before it is returned, and close proctoring during exams. Students who are suspected of committing infractions will be reported to the Office of Student Conduct.

*If a student is found in violation of academic integrity, it is at the professor's discretion to give the student a failing grade for the assignment and the course.*

**Attendance**

Attendance (lectures and recitations) is required, and is essential for learning the course material.
Course Outline

1. Introduction, Descriptive Statistics and Data Analysis
   Newbold, Carlson, Thorne, Chapters 1, 2

2. Probability
   Newbold, Carlson, Thorne, Chapter 3

3. Discrete Random Variables and Probability Distributions
   Newbold, Carlson, Thorne, Chapter 4 (omit sections 4.5 & 4.6)

4. Continuous Random Variables and Probability Distributions
   Newbold, Carlson, Thorne, Chapter 5 (omit sections 5.4 & 5.5)

5. Sampling and Sampling Distributions
   Newbold, Carlson, Thorne, Chapter 6

6. Point and Interval Estimation
   Newbold, Carlson, Thorne, Chapter 7,
   Newbold, Carlson, Thorne, Chapter 8 (omit section 8.5)

7. Hypothesis Testing
   Newbold, Carlson, Thorne, Chapter 9
   Newbold, Carlson, Thorne, Chapter 10

8. Analysis of Categorical Data
   Newbold, Carlson, Thorne, Chapter 14 (14.1, 14.3)

9. Analysis of Variance
   Newbold, Carlson, Thorne, Chapter 15 (15.1, 15.2)

10. Regression, Model Building and Forecasting
    Newbold, Carlson, Thorne, Chapter 11,
    Newbold, Carlson, Thorne, Chapter 12,
    Newbold, Carlson, Thorne, Chapter 13 (13.5, 13.6, 13.7),
    Newbold, Carlson, Thorne, Chapter 16 (16.3, 16.6)
Departmental Course Policies

Beginning with the Fall 2006 quarter, courses taught in the Department of Economics are covered by a common set of course management policies laid out in this document.

Exam Attendance

Courses have individual policies regarding midterm exam attendance. Final exams attendance is mandatory and is governed by a number of university regulations. Final exams can only be given on the exam date scheduled by the university registrar. No instructor can hold a final exam or require submission of a take-home exam except during the period in which final examinations are scheduled. No final exams may be scheduled during the last week of classes or on reading days. All students must be allowed to see their final exam, with an access period of at least one regular semester after the exam has been given.

In cases where attendance at a midterm or a final exam is mandatory, there are only a few valid excuses for missing an exam. Valid excuses are:

- 3 exams scheduled within one calendar day
- If exam is given outside of the regular class schedule and the timing conflicts with another class for which the student is enrolled.
- Documented illness/health emergencies
- Religious observance
- UPENN Business that takes you away from Campus
- Documented disabilities that allow you to take the exam under other circumstances
- A death in the family

Examples of reasons that are not valid for missing an exam are:

- Job interviews
- Job internships
- Beginning fall or spring break early or returning after a scheduled exam
- End of semester early flights
- Any other reason you would prefer not to be at the university when the exam is scheduled.

Students are responsible for making sure, at the beginning of the term, that they can attend the exams. Registering for a course means that you certify that you will be present for the exam (unless one of the explicitly stated exceptions above arises.)

If you are unexpectedly ill at the time of the exam and unable to reach the instructor ahead of time, then you can give notification and documentation of your illness as soon as you are able. Do not take an exam if you are ill and then expect to have an opportunity to retake the exam because you were ill the first time and did poorly.

Absence from campus on UPENN business includes, for example, athletic events in which you are actively participating. In such cases, you need to make arrangements with your professor ahead of the exam date to take the exam at another time (preferably earlier than the schedule date).

Students who arrive late to an exam will generally be required to hand in their exam at the same time as other students.

Academic Integrity

If a student is found in violation of academic integrity, it is at the professor's discretion to give the student a failing grade for the assignment and the course.

Withdrawals and Incompletes

UPENN provides an option for students to withdraw from courses to do so; students may withdraw up to the end of the 8th week of classes for any reason. Students may request incompletes after that deadline provided (1) the only work that is incomplete is the course final exam or final paper and (2) there is a health emergency or a death in their family. Students should work out an arrangement for clearing an incomplete with the professor as soon as possible.
Make-up Exams

Make-up final exams are to be taken only during the designated make-up exam week, usually at the beginning of the following semester.

Deadlines

Work should be handed in on time. Work that is not handed in on the day that it is due may, at the professor's discretion, receive less or zero credit. Professors may request that a hard copy rather than an emailed copy be handed in.

Grading

The relative weights on the different elements course work are set by the instructor. So are the rules that permit (or do not permit) dropping the lowest problem set score. If a student is permitted to drop one exam or problem set score, but misses more than one exam (for an invalid reason), then the student may receive a zero for the missed exam.

One department-wide rule is that, if the course permits dropping the lowest problem set score, a student who has entered a course late and missed the first problem set drops that one, not a later one.

Correcting Errors in Grading

Errors in grading sometimes occur; this section lays out rules and procedures for requesting a correction. The important general rule is that such a request should clearly and succinctly state the unambiguous error you believe has occurred.

Errors in grading arising from illegible or garbled answers are not subject to correction. Students who believe their work has been graded incorrectly should petition for a correction in writing to the Professor. Students should not approach either the instructor or the TA with an oral request before making their written request. Requests should be focused on the specific error and should be made within a week of the work being returned.

The entire graded work (problem set or examination) should be resubmitted; there is no guarantee that grades will rise as, statistically, positive and negative errors in grading are equally likely. If the request arises because you think different students have been graded differently, all the affected students should submit their work as a group.

Here is a suggested way to request to correct an error grading: "Dear Prof. X: I am a student in your economics 222 course. I believe that the grades on my midterm were added up incorrectly. As you can see from the exam I left in your mailbox, I have 25 on each of the four questions, but 73 on the exam. Sincerely, Z."

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If a student is found in violation of academic integrity, it is at the professor's discretion to give the student a failing grade for the assignment and the course.

updated September, 2008