Introduction to Statistics for Business and Economics (Economics 270)
Fall 2010 Syllabus

Sumedha Gupta
Office: Cavanaugh 524
Class meeting: MW 9:00-10:15pm
e-mail: sugupta@iupui.edu
Room: CA 239
Office Hours: W 2-4 pm, by appointment.
Tutor: TBA
Office Hours: M 11-12:15pm W 11-12:15pm

Description: Econ 270 introduces students to statistical thinking. Students will learn how to use statistical thinking to get a handle on the uncertainty and ambiguity in phenomena they want to understand. The course covers sampling distribution, confidence intervals, hypothesis testing, simple regression, and time series. The approach uses many hands-on, in-class experiments to convey the idea that underlies statistics.

Principles of Undergraduate Learning: This course teaches the core communication and quantitative skills principle. In particular, the course teaches how to perform quantitative analysis.

The course also teaches the critical thinking principle. The course teaches how to use data, combined with logic, to reach valid solutions to challenging problems. Also, the course teaches students how to think critically about ambiguous situations.

Finally, the idea that underlies statistics is subtle and powerful. Hence, by teaching this idea, the course advances students’ intellectual depth.

Required texts

To purchase these materials you have two options:

You can either purchase either option through our campus bookstore or through Aplia.com. It is less expensive to purchase through Aplia.com: the hardcopy textbook bundle is $155 (plus shipping and handling), and the E-book text bundle is $80. If you purchase the Ebook text bundle and later in the semester decide you want the hardcopy textbook, Aplia.com will sell it to you for $75 (plus shipping and handling).

If you purchase them from Aplia.com, you will need a “Course Key.” Our course key is:
We will use the Aplia computer-based homework system to do homework. You **must** register for Aplia before our next class meeting!

**Registration**

If you have never used Aplia before...
2. Click the **Create a New Account** link and choose **Student Account**. You will then enter your course key: KV9N-MK2N-HEU4. Continue following the instructions to complete your registration.

If you have used Aplia before...
2. Sign in with your usual e-mail address and password and enter your Course Key when prompted: KV9N-MK2N-HEU4. If you are not prompted for a new Course Key, click the **Enroll in a New Course** button at the top of your My Courses page to enroll in a new Aplia course. Enter your Course Key when you are prompted.

* You will have different payment options after you register for your course. If you choose to pay later, you can use Aplia without paying until 11:59 PM on 09/12/2010.

**Payment**

**Option 1: Digital Textbook with Aplia Access**
- From Aplia: Purchase access to your course from Aplia's website for $80.00 USD.
- From Bookstore: Purchase an Aplia Access Card from your campus bookstore.

**Option 2: Physical Textbook with Aplia Access (also includes digital textbook)**
- From Aplia: Purchase access to your course for $80.00 USD and a physical book for $89.00 USD from Aplia's website.
- From Bookstore: Purchase an Aplia Access Card and a physical book together as a bundle from your campus bookstore.

* If you purchased an Aplia Access Card from a bookstore, enter the Access Card's payment code on Aplia's website as payment for your Aplia course.
* You will have access to your digital textbook up until the end of this course.

**Aplia Live Support Chat**

After you register with Aplia and logon, there will be a “Support” option in the lower right-hand corner of your screen. Click on it to get technical help with Aplia. Live Chat is available from 8:00 AM to 5:00 PM Pacific Time, Monday through Friday. At other times there is e-mail support.

Aplia offers technical support using Aplia, not help with statistics.
**Course Web Page**  
https://oncourse.iu.edu/portal/site/FA10-IN-ECON-E270-4565

**Student responsibilities**

1. Participation in class.  
Because the class time is spent explaining ideas from perspectives not in the text and asking questions, I expect diligent class attendance and participation in class discussions and exercises. You are responsible for catching up on any material covered in case you miss class. Finally, although there is no penalty for absenteeism class attendance and active participation is a measure of student effort. These will be taken into account in case for any reason the student has been unable to perform as well as expected in graded problem sets, midterms and the final exam.  
You must complete reading assignments BEFORE class.

2. Homework.  
We will use the Aplia computer-based homework system to do homework. There will be 5 assignments. You must complete each assignment by the due date and time. If you miss the due date and time, your homework grade will NOT be included in your final grade. All due dates are mentioned on the course web page in the Assignments 2 section. You are responsible for keeping track of submission dates for problem sets.

3. Mid-term exams.  
We will have an exam after each of the first three chapters in the course: Chapter 7 (Sampling Distributions), Chapter 8 (Confidence Intervals), and Chapter 9 (Hypothesis Tests). The fourth midterm will cover Chapter 12 (Simple Linear Regression) and some other topics to be announced. I want to be flexible about when we finish a chapter, so I do not know exactly when the exams will be, but I promise to give one week’s notice.

The midterms and the final will be graded on a straight percentage scale. They are multiple choice tests, but you need to be able to work the problems as in class and in Aplia to be able to select correct answers.

No excuse other than extreme emergency will be accepted for missing a midterm. If an emergency does arise e-mail me or call Ms. Renollet (274-4756) to inform us of the problem before the midterm. In the case of a legitimate emergency, you will be allowed to miss the midterm, and your final exam grade will be reweighted to account for the weight of the missed exam. Out of fairness to the other students I will ask that you subsequently provide me with written verification of the emergency. Make-up exams will not be given. If there is no emergency (or you do not notify me or Ms. Renollet in advance) you will not be offered a reweighted final exam, and your grade for the missed exam will be the class minimum minus ten points.

All Econ 270 sections take a common final to be held on **Thursday December 16, 2010, from 8:00 am – 10:00 am**. You must take the exam at this time, no exceptions. You must not make any plans that would be in conflict with you taking the exam on December 16. If you already have such plans, you must speak to me today or Wednesday this week, or we cannot guarantee alternative arrangements.

**Grading percentages:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework / participation</td>
<td>15 percent</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>15 percent</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>15 percent</td>
</tr>
<tr>
<td>Midterm 3</td>
<td>15 percent</td>
</tr>
<tr>
<td>Midterm 4</td>
<td>15 percent</td>
</tr>
<tr>
<td>Final (May 6)</td>
<td>25 percent</td>
</tr>
</tbody>
</table>

---

**Course grades**

Problem sets and midterms will be graded as follows:

- **A+**: 97-100
- **A**: 93-96.99
- **A-**: 90-92.99
- **B+**: 87-89.99
- **B**: 83-86.99
- **B-**: 80-82.99
- **C+**: 77-79.99
- **C**: 73-76.99
- **C-**: 70-72.99
- **D**: 60-69.99
- **F**: 59.99 or below

In the past, this produces an average grade of around 65 with a standard deviation of around 16. Based on the average and standard deviation, the final course grades will be recalculated based on a curve. Here is how I will curve the course grades. I first calculate a grade based on the above grading percentages. I then give people a grade based on the usual grading scale using which the curve would look something like:

- More than 1.5 standard deviations above average (e.g., 89 or more) . . . A
- Between 1.25 to 1.5 standard deviations above average (e.g., 85 to 89) . . . A-
- Between 1.0 and 1.25 standard deviations above average (e.g., 81 to 85) . . . B+
- Between 0.5 to 1.0 standard deviation above average (e.g., 73 to 81) . . . B
- Between average and 0.5 standard deviation above average (e.g., 65 to 73) . . . C+
- Between 0.5 standard deviation below average to average (e.g., 57 to 65) . . . C
- Between 1.0 and 0.5 standard deviations below average (e.g., 49 to 57) . . . C
- Less than 1.0 standard deviation below average (e.g., 49 or less) . . . D
However, not all students earn the curve grade. Only those whose effort is commendable will earn the curved grade. I gauge effort by how many of the Aplia homework assignments you complete, whether you take the practice final, and your class participation. That is, whether you will get the “straight” grade (usual grading scale) or the curved grade depends on the effort you put into the course.

Note that the “curve” is applied to the final course grade only. I do not curve the individual midterm grades.

Communication: If you send me e-mail through Oncourse, be sure to check the box: Send a copy of this message to recipients’ email address(es)
If you do not check this box, I will not see your e-mail for days.

Americans with Disabilities Act:
If you need any special accommodations due to a disability, please contact Adaptive Educational Services at (317)-274-3241. The office is located in CA 001E.

Fall 2010 Schedule

  Lecture 1 - Discrete random experiments; Continuous random experiments
  Lecture 2 - Random variables; Standardized normal random variables; How to read a z-table; Calculating a standard deviation

Lectures 3 - 12: Sampling distributions. Text chapter 7.
  Lecture 3 - The sampling distribution of the sample mean
  Lecture 4 - $X$ events
  Lecture 5 - The standard error
  Lecture 6 - Intuition and example problems about finding the probability $X$ events
  Lecture 7 - Sampling distribution of a spinner, What happens to the sampling distribution if you increase $n$?
  Lecture 8 - Continued from previous lecture
  Lecture 9 - The Law of Large Numbers and the Central Limit Theorem
  Lecture 10 - The sampling distribution of the sample proportion
  Lecture 11 - Applications of sampling distributions
  Lecture 12 - Midterm 1

  Lecture 13 - Using $X$ to estimate $\mu$
  Lecture 14 - Hypothetical repeated samples from the bag-of-balls population; Correct interpretation of a confidence interval
  Lecture 15 - That’s not normal
  Lecture 16 - Continued from previous lecture: interpretation, discussion, example problems
  Lecture 17 - Example problems of confidence intervals
  Lecture 18 - Midterm 2
Lecture 19 - Using a confidence interval to change your mind about the population mean $\mu$
Lecture 20 - p-values; The standard language of hypothesis testing
Lecture 21 - Testing "one-sided" hypotheses.
Lecture 22 - One-sided hypotheses (continued); Testing a hypothesis about the population proportion $p$; How to decide which hypothesis should be the null hypothesis
Lecture 23 - Example problems of hypothesis testing
Lecture 24 - Midterm 3

Lecture 25 - The population regression function and the sample regression function
Lecture 26 - The sample regression function in hypothetical repeated samples
Lecture 27 - Example problems of simple regression; Summary of the entire course; Causality
Lecture 28a - Midterm 4 (30 minutes)

Lectures 28b: Time-series/forecasting. Text chapter 18.2.

Lectures 29 - 30: Prepare for the final exam
Lecture 29 - You take a practice final exam
Lecture 30 - Go over the practice final exam

When the Aplia homeworks are due:
Week 1 – Introduction to Using Aplia Problem Sets
Week 2 – Probability Review
Week 4 – Problem Set #1
Week 6 – Problem Set #2
Week 9 – Problem Set #3
Week 13 – Problem Set #4
Week 15 – Problem Set #5

This schedule is subject to change. Any changes will be announced in class, but also will be apparent in Oncourse and Aplia’s “Course Outline.” There could also be homework assigned in class that does not use Aplia.

Cheating
Any instance of copying during the midterms and exams will result in a grade of F for the course and a report to the Dean of Student Affairs. Cheating is a personal insult to me and your fellow students. Not much makes me angry, but if you cheat and I catch you, it will be ugly. Statements about cheating and plagiarism from IUPUI’s Student Code of Conduct are reproduced below.
Student Code of Conduct: Section G “Academic Responsibilities and Misconduct”

The following is copied from the Student Code of Conduct. The entire code can be read at: http://www.iupui.edu/code/CSR_0106.pdf

G. Academic Responsibilities & Misconduct

Academic misconduct is defined as any activity that tends to undermine the academic integrity of the institution. The university may discipline a student for academic misconduct. Academic misconduct may involve human, hard-copy, or electronic resources. Policies of academic misconduct apply to all course-, department-, school-, and university related activities, including field trips, conferences, performances, and sports activities off campus, exams outside of a specific course structure (such as take-home exams, entrance exams, or auditions, theses and master’s exams, and doctoral qualifying exams and dissertations), and research work outside of a specific course structure (such as lab experiments, data collection, service learning, and collaborative research projects). The faculty member may take into account the seriousness of the violation in assessing a penalty for acts of academic misconduct. The faculty member must report all cases of academic misconduct to the dean of students, or appropriate official.

Academic misconduct includes, but is not limited to, the following:

1. Cheating

Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.

a. A student must not use external assistance on any “in-class” or “take-home” examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.

b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advance authorization from the instructor to whom the work is being submitted.

c. A student must not use materials from a commercial term paper company; files of papers prepared by other persons, or submit documents found on the Internet. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student’s individual work.

d. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.

e. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.

f. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom he work is being submitted.

g. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.

2. Fabrication

A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of
information.

3. Plagiarism
Plagiarism is defined as presenting someone else’s work, including the work of other students, as one’s own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered “common knowledge” may differ from course to course.

a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
b. A student must give credit to the originality of others and acknowledge indebtedness whenever:
   1. Directly quoting another person’s actual words, whether oral or written;
   2. Using another person’s ideas, opinions, or theories;
   3. Paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
   4. Borrowing facts, statistics, or illustrative material; or
   5. Offering materials assembled or collected by others in the form of projects or collections without acknowledgment.

E270 COMMON FINAL:
Thursday
December 16, 2010
8:00 - 10:00 AM

Every E270 student must plan to take the E270 final at that time. Do not make any other plans that are incompatible with your responsibility to take the final exam at that time!

Do not make travel plans (e.g., buy airline tickets) that are incompatible with your being in Indianapolis on that Thursday morning.

If you have already made such plans let your instructor know IMMEDIATELY.

The exam is not held in your usual classroom. It is held in the Lecture Hall.

This is the building directly south of Cavanaugh Hall.