DECS-434: INTRODUCTION

COURSE DESCRIPTION
The goal of DECS-434 is to teach you to solve real problems using regression analysis and related statistical techniques for quantitative analysis of data. By the end of the course, you should understand what regression is and how to apply it in a variety of decision-making contexts. As well as understanding the statistical theory underlying regression, you should become familiar with a number of applications of regression in areas such as finance, marketing and management.

PREREQUISITES
The only prerequisite for this course is familiarity with some concepts from the statistics portion of the DECS-433 curriculum. In particular, we will make use of the notions of sampling and sampling distribution, the normal and t-distributions, and confidence intervals. Chapter 1 of the textbook reviews all the fundamental concepts from the statistics portion of DECS-433. I highly recommend that you read this chapter to review this material or learn any portion of it that you may have missed. If you waived DECS-433, you should certainly go through Chapter 1. The first two chapters of the Kellogg Statistics Essentials online tutorial (http://ecourses.kellogg.northwestern.edu/kellogg_stats/login/login.cfm) are also useful in this regard.

ASSIGNMENTS, READINGS AND GRADING
Assignments will consist of weekly homework. The questions for the homework assignments will be posted on the course webpage, accessible through the Course Management System (CMS) site at Northwestern (https://courses.northwestern.edu/webapps/login). Please note that the first assignment (to be done individually) is due at the beginning of class on Thursday, January 12. This assignment will cover some material from Chapter 1 and provide practice with the material covered in the first week of class from Chapter 2.

You should bring your textbook with you to class, as we will be making use of it there and you will often find it helpful to consult tables and graphs from the text as we proceed. The class will be divided into study groups (assigned by me), and you should do the group homework assignments with your group (i.e., each group should hand in a single piece of work). In addition,
there will be three pieces of homework to be done individually (the first assignment, one in week 4 of the quarter, and another towards the end of term). There will be a midterm exam, due at the beginning of week 6, and a final exam as per the Kellogg exam schedule. I will feel free to “cold call” students at any point during class. You are expected to have kept up with what has been going on in class and be prepared for such questions.

Your final grade will depend on

- group homework (20%) (homework scores 15%, peer evaluation 5%)
- individual homework (15%)
- midterm (25%)
- final (35%)
- class participation, including discussion of cases (5%)

Homework assignments should be handed in at the beginning of class on the due date. No late work will be accepted. If you cannot attend class, you may email or fax your homework to me. Some homework will require you to download data files from the course homepage, which is accessible from the CMS course page (https://courses.northwestern.edu/webapps/login).

The following is the list of deadlines and homework dates:

Thursday, January 12: Assignment #1 due (individual)
Thursday, January 19: Assignment #2 due (team)
Thursday, January 26: Assignment #3 due (individual)
Thursday, February 2: Assignment #4 due (team)
Thursday, February 9: Midterm Exam due (individual), Assignment #5 due (team)
Thursday, February 16: Assignment #6 due (team)
Thursday, February 23: Assignment #7 due (team)
Thursday, March 2: Assignment #8 due (team)
Thursday, March 9: Assignment #9 due (individual)

The final exam will take place according to Kellogg’s exam schedule and will be three hours long. Exams are individual, open-book, open-notes, and timed; computer use will be required.

COURSE MATERIAL AND SOFTWARE
You are required to purchase the textbook: Managerial Statistics: A Case-Based Approach by Klibanoff, Sandroni, Moselle and Saraniti, 1st ed., Thomson SouthWestern Publishing, 2005. This
is a brand new text, developed and written at Kellogg and tailored for this course. As such, we will be using it extensively and it contains the most important readings. Several HBS cases we will be using are bundled with the text. You are also required to download and use the Kstat statistical package for Microsoft Excel. The file is Kstat.xls and it may be found on the CMS web page for the class along with the rest of the data files we will use. A mini-manual for the Kstat program is contained near the end of the textbook. The CMS course page (https://courses.northwestern.edu/webapps/login) will be used for posting of announcements, homework assignments, homework solutions, additional handouts, and other important materials. You are responsible for regularly checking, downloading, and reading materials posted on the site, as they form an integral part of the class. There are no other required materials for this course. The Kellogg Statistics Essentials Online tutorial (http://ecourses.kellogg.northwestern.edu/kellogg_stats/login/login.cfm) provides an additional resource.

COMPUTER USE IN THE CLASSROOM AND CLASSROOM BEHAVIOUR
We will use Microsoft Excel in almost every class session. You are welcome to bring your laptop to class in order to use Excel and Kstat and perform calculations on your own computer. However, you may not engage in distracting behavior such as using your laptop to surf the Web, to check e-mail, to do instant-messaging or any other activities not directly connected with what is going on in class. General classroom behavior should follow the guidelines in the Kellogg Code of Classroom Etiquette (see http://www.kellogg.northwestern.edu/stu_aff/policies/etiquette.htm).

OFFICE HOURS, CONTACT INFORMATION AND PROBLEM SESSIONS
My office is in Jacobs Center (Andersen Hall), room 534. My office hours will be TBA. If you cannot visit during office hours then write me an e-mail (k-schmedders@kellogg.northwestern.edu) to make an appointment. E-mail is my preferred contact method and is the fastest and most reliable way to reach me. My office phone is (847) 491-5158. Fax is (847) 467-1220. There will be problem and review sessions held by teaching assistants on Wednesdays; time and room TBA.

MISCELLANEOUS
This course may also be taken in a turbo version, DECS-437. If you are thinking about this option and would like some advice, feel free to consult me. Finally, please bring your nameplate to class and display it throughout the term.
**KELLOGG HONOR CODE**

The Kellogg Honor Code is applicable in this class. The complete text of the Honor Code is available on the Honor Code website:

http://www.kellogg.northwestern.edu/stu_aff/policies/honorcode.htm

The Honor Code is enforced at Kellogg and violations are subject to disciplinary sanctions. The following discussion in this syllabus of the Honor Code does not cover all applications of the Honor Code but only highlights some very important aspects of it. If you believe something is unclear or has been omitted, please do not hesitate to speak to me.

**Assignments**

Write-ups must be your original work. You may not use materials containing solutions or partial solutions to the assignments (including solutions prepared by current or former Kellogg students). If your analysis contains information from outside sources, then you must properly cite the sources. You may not discuss the group assignments with any person who is not a member of your group, other than me. You may not discuss the individual assignments with any person other than me.

**Exams**

No assistance may be given or received during an exam. Regardless of when you take the exam, you may not discuss the exam with any other person before the graded exams are returned (in case there are students who have not yet taken the exam). Even casual statements, such as “it was easy” or “it was hard” are not permitted. Exams must be completed within the allotted time and only approved materials may be used. In the event of a take home exam, the exam must be completed within the allotted time and in a consecutive period.

**Attendance**

You are expected to attend each class. Please notify me ahead of time if you will be unable to attend a particular class.
**DECS-434: COURSE OUTLINE**

The table below gives an approximate outline of the course. All readings are from *Managerial Statistics: A Case-Based Approach* (MS). Assignments are due at the **beginning of class**. They can be found on the CMS course web site.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Examples and readings</th>
<th>Assignments due</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction. Hypothesis testing: theory and one-population tests.</td>
<td>Chapter 1 for basic statistics concepts; Chapter 2, sections 2.1-2.3 for hypothesis testing.</td>
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<tr>
<td>2</td>
<td>Introduction to Regression.</td>
<td>Chapter 3.</td>
<td>Assignment (individual) 1</td>
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<tr>
<td>3</td>
<td>Estimating the CAPM model. Prediction and statistical inference in simple regressions. Intercept dummies.</td>
<td>Chapter 4; Handout on “Dummy Variables”</td>
<td>Assignment (team) 2</td>
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<tr>
<td>4</td>
<td>Introduction to multiple regression: omitted variable bias. Slope dummies.</td>
<td>Case Insert 1: “Energy Costs and Refrigerator Pricing,”; Chapter 5, section 5.2; Chapter 7, section 7.5.</td>
<td>Assignment (individual) 3</td>
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<tr>
<td>5</td>
<td>Regression model analysis (curvature, outliers, and influential observations), spurious correlation.</td>
<td>Chapter 5, section 5.3; Chapter 6.</td>
<td>Assignment 4 (team)</td>
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<tr>
<td>6</td>
<td>Statistical inference in multiple regressions. Market share and pricing in the hot dog market.</td>
<td>Chapter 7, sections 7.1-7.4.</td>
<td>Midterm due; Assignment (team) 5</td>
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<td>9</td>
<td>Nopane Advertising Strategy Case; Baseball Case; review.</td>
<td>Case Inserts Three and Four: “Nopane Advertising” and “Baseball”</td>
<td>Assignment (team) 8</td>
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<tr>
<td>10</td>
<td>Case to be determined. Preparation for the Final Exam.</td>
<td>Case materials to be distributed.</td>
<td>Assignment (individual) 9</td>
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