Advanced Statistical Inference
Course Syllabus

Information

Course

MGT 70100, Module 2, Fall Semester 2013.

•Web: `http://www.nd.edu/~mbastats` (Requires an ND log-in when off campus; note that this web page is displayed in Sakai)
•When: 8:00 to 9:50 AM Mondays and Wednesdays.
•Where: L051 Mendoza College of Business.
•Prerequisite: MGT 60100 Statistics (or an equivalent statistics course).

Professor

Ken Kelley, Ph.D.
•Email Address: KKelley@ND.Edu
•Office Hours: Mondays & Wednesdays 2:00–4:00, by appointment, and anytime my office door is open.
•Office Location: 363B Mendoza College of Business.
•Office Phone Number: (574) 631-1459.
•Mobile Phone Number: (574) 607-5478 (Text messages are fine).

Description

Statistics is the science that deals with the collection, description, analysis, interpretation, and presentation of data. In *Advanced Statistical Inferential*, students learn the conceptual underpinnings of statistical methods and how to apply them to address more advanced statistical question than are covered in an introductory MBA statistics course. The statistical methods covered in the course are useful for many types of questions that relate to multiple variables and/or multiple groups. Learning how to effectively use data and statistical methods to make evidence based business decisions is the overarching goal of the course.

Statistical analyses will be performed using SPSS and Excel. Microsoft Word is required for all written assignments (output from SPSS and Excel should be copy/pasted into Word).

Objectives

The course objectives for each of the statistical methods you will learn are as follows:

1. Understand the types of questions that the statistical method addresses;

2. Apply the method to other examples and situations;

3. Implement the method using software (e.g., SPSS or Microsoft Excel);

4. Interpret the results in a way that addresses the question of interest;

5. Use data to make evidence based decisions that are technically sound.

6. Communicate the purposes of the analyses, the findings from the analysis, and the implications of those findings.

Topics Will Include Some of the Following

- Inference for two means (independent and paired);
- Inference for variances;
- Multiple regression techniques;
- One-way analysis of variance and its extensions;
- Analysis of covariance and its extensions;
- Multivariate analysis of variance and covariance;
- Discriminate analysis;
- Inference for proportions and comparison of proportions;
- Chi-square goodness of fit and tests of independence;

Course Format

Class will usually consist of a lecture, discussion, and application of the relevant statistical methods via computer. There will be in-class work for immediate feedback on the topic. Each topic will have an assignment of specific problems and a topical case.

Attendance

Attendance is required.

Participation

Active participation is an important part of the class, which necessarily requires attendance. Participation is required, which necessitates attendance.

Course Notes

I will provide a note packet for each of the topics. However, the course is more than simply a set of note packets. Correspondingly, they should not be regarded as all that is necessary to understand the course material and implement the methods.

Readings

In addition to course notes, I will provide a reading for each of the topics via PDF file on the web site. However, the course is much more than a set of readings. Correspondingly, they should not be regarded as all that is necessary to understand the course material and implement the methods.

Topical Cases

The topical cases will ask specific questions as well as provide the student the opportunity to convey information about the statistical method and the results, especially the meaning of the results and how they relate to the question of interest. Collaboration is encouraged on topical cases; see below for collaboration rules. For each topical case, students will be assigned to work together in a small team environment, much like analysts in the workplace. A single assignment score will represent

the score for each group member. The topical cases will account for 50% of the course grade. If there are any collaboration issues on the topical cases, it is your responsibility to let me know so that a solution can be found.

Assignments

There will be focused assignments that will help focus your reading and understanding of the various methods. For each focused assignment, students may collaborate with whomever they would like, if anyone at all. Assignments will account for 15% of the course grade.

Exam

The exam is an individual based effort, in which you may not collaborate with anyone (inside or outside of the class). The exam is open notes and open readings. Material from outside of the course should not be used to answer any questions. For example, you should not analyze a set of data with a method discussed in a textbook but not our class. The exam will be distributed the last day of class and due by 5PM on Tuesday of exam week. The exam will consist of specific questions, application of statistical methods for data sets to address specific questions, and interpretation of the meaning of results. The exam is a sampling of the assignments, in-class activities, and topical cases. The reason the exam is a take-home rather than done in the classroom is because I do not want there to be any time pressure when taking the exam. The time allowed to work on the exam is not commensurate with the time it will take! Due to students' busy schedule at the end of the semester, I allow ample time (6 days!) for students to complete the exam. Further, unlike an in-class exam, any computer issues will not use valuable exam time. I do not want any computer issues or time pressure to affect a student's performance. The exam will account for 35% of the course grade.

Collaboration

Students are encouraged to discuss readings, lectures, handouts, and the assignments with other students. The topical cases should be discussed *only* with the assigned team members. The final project is an individual based exam and thus does not allow any form of collaboration. For any questions, ambiguities, or issues regarding collaboration, please contact me.

Grading

The course grade consists of (from above) topical cases (50%), assignments (20%), and the exam (30%). Recall that the MBA grading policy stipulates that the course GPA be in the range of 3.3 to 3.6 (http://business.nd.edu/MBA/Academics/Academic_Policies/).

Academic Honesty

Students in *Advanced Statistical Inference* are expected to abide by the University of Notre Dame Mendoza College of Business Graduate Academic Code of Honor.

Syllabus Disclaimer

The information provided on this syllabus is tentative and may be modified. Modifications to the syllabus will be announced during class.