



**Subject: EBGN      Number: 690**

**Course Title: Advanced Econometrics**

**Section: A**

**Semester/year: Fall/2015**

**Instructor or Coordinator: Harrison Fell**

**Contact information (Office/Phone/Email): EH 313/303-273-3757/hfell@mines.edu**

**Office hours: T,TR 3:00 – 4:30**

**Class meeting days/times: T,TR 9:30 – 10:45**

**Class meeting location: EH 211**

**Web Page/Blackboard link (if applicable): Blackboard site available to enrolled students**

**Instructional activity: 37 hours lecture    3 semester hours**

**Course designation:**     Common Core     Distributed Science or Engineering  
                                   Major requirement     Elective     Other (required graduate students)

**Course description from Bulletin:**

A second course in econometrics. Compared to EBGN590, this course provides a more theoretical and mathematical understanding of econometrics. Matrix algebra is used and model construction and hypothesis testing are emphasized rather than forecasting. Prerequisites: Principles of Microeconomics, MATH111, MATH5301, EBGN509, EBGN590; or permission of instructor. Recommended: EBGN511.

**Textbook and/or other requirement materials:**

**Required text:**

*Econometrics Analysis: 7<sup>th</sup> Edition*

William H. Greene

ISBN: 0-13-139538-6

**Other required supplemental information:**

*Econometrics of Cross Section and Panel Data* by Jeffrey Wooldridge

*Mostly Harmless Econometrics: An Empiricist's Companion* by [Joshua D. Angrist](#) and [Jörn-Steffen Pischke](#)

*Microeconometrics: Methods and Applications* by A. Colin Cameron and Pravin K. Trivedi

**Student learning outcomes: At the conclusion of the class students will...**

1. further their abilities to use statistics and economics
2. understand estimation methodologies and data issues relevant in micro-econometric applications
3. gain understanding of the statistical package STATA
4. write a paper that will hopefully be suitable for use in their dissertation

**Brief list of topics covered:**

1. Least Squares and Hypothesis Testing Review
2. Dummy variables and Generalized Error Structures
3. Instrumental variables, System of Equations
4. Maximum Likelihood, Generalized Method of Moments
5. Panel Data Models
6. Policy Analysis Techniques

**Policy on academic integrity/misconduct:** The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining an fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy is [online](#).

**Grading Procedures:** *(Note: all courses must have a published, transparent grading policy that students can use to gauge their performance and progress in the class through the course of the semester.)*

**Coursework Return Policy:** *(Note: all courses must have a published, good-faith policy defining when homework, exams, and other graded coursework will be returned. In general most work should be returned to students within two weeks, along with suitable materials/feedback that enable students to understand how to improve their learning/performance.)*

The grading of this class will be based on 4 deliverables – a midterm, a take-home final, homework assignments, and a research project. The weighting of these deliverables for the final grade are as follows:

Midterm –	25%
Final –	30%
Research Project –	30%

Homework – 10%

Late homeworks will not be accepted. Homeworks should be typed and include code when required.

The research project will require a relatively short written document (maximum of 15 pages, minimum of 8). The project also requires some data analysis and, thus, requires some coding. MS students taking the class can do a team project, consisting of two members. PhD students must submit their own paper. I will provide some research ideas for this project, but students are free to come up with their own ideas as well. Either way, a brief project summary, complete with data sources, is **due by the 8<sup>th</sup> week of class**. We will discuss more requirements

Finally, note that the points do not sum to 100%. I reserve 5% of the grade to be given at my discretion for attendance, participation, and general attentiveness.

**Absence Policy** (e.g., Sports/Activities Policy): Attendance and participation are mandatory. Please notify the instructor of any planned absences.

**Homework:**

- Homework must be turned in before it is due to be graded – plan ahead.
- Exams: If you will be absent during a scheduled exam, you should schedule a make-up time before you leave.

**Common Exam Policy** (if applicable):

**Detailed Course Schedule:** *(Note: it is recommended that the syllabus provide a detailed week-by-week schedule of course activities, including readings, exam and project due dates, etc., as a common courtesy to students.)*

Below is a tentative outline for the class. The readings are all from Greene's book. Additional readings will be assigned as we get closer to the topics covered. Topics, readings, and listed order are all subject to change based on class progress and professor preferences. Please consult the blackboard page for this class frequently for updates on topics covered and required readings.

Week 1 – Least Squares and Hypothesis Testing Review

- Reading: Chapters 2 – 4

Week 2 – Generalized Error Structures and Quantile Regressions

- Reading: Chapters 5 – 6

Week 3 – Instrumental variables

- Reading: Chapters 8, 10

Week 4 & 5 – Maximum Likelihood, Generalized Method of Moments

- Reading: Chapters 12 – 13

Week 6 – Non-parametrics

- Reading: Chapters 12 & 15

Week 7 – Panel Data Models & Midterm

- Reading: Chapter 11

Week 8, 9, & 10 – Policy Analysis: Structural breaks, Diff-in-Diff, Triple Diff, Simulated Controls, Matching estimators, Regression Discontinuity

- Reading: Chapter 9 and external readings

Week 11 & 12 – Discrete Choice Models and Count Data

- Reading: Chapter 17 & 18

Week 13 – Limited Dependent Variables

- Reading: Chapter 19

Week 14 & 15 – Special Topics: Time Series, Spatial Analysis, Double Hurdle Models, Dynamic Discrete Choice, BLP Models

- Readings: to be assigned