COLORADOSCHOOLOFMINES

Subject: Economics and Business Number: EBGN 303

Course Title: Econometrics

Section: A

Semester/year: Spring 2017

Instructor or Coordinator:

Contact information (Office/Phone/Email): Engineering Hall Room 129 / 303-445-2736 / spiper@mines.edu or spiper@usbr.gov

Office hours: Tuesdays 9:15 AM to 10:30 AM or by appointment

Class meeting days/times: Tuesdays and Thursdays 8:00 AM to 9:15 AM

Class meeting location: Alderson Hall, Room 230

Blackboard link: ECONOMETRICS Sec. A - Spring 2017 (Spring2017-EBGN303A)

Instructional activity: 3 hours lecture 3 semester hours

Course designation: Major requirement

Course description from Bulletin: Introduction to econometrics, including ordinary least-squares and single-equation models; two-stage least-squares and multiple-equation models; specification error, serial correlation, heteroskedasticity, and other problems; distributive-lag models and other extensions, hypothesis testing and forecasting applications. Prerequisites: EBGN201 and MATH323.

Textbook and/or other requirement materials:

Required text: Using Econometrics: A Practical Guide, A. H. Studenmund, 7th ed. Pearson Education, Inc., 2016

Other required supplemental information: Handouts as needed.

Student learning outcomes: At the conclusion of the class students will…

1. Estimate and interpret multiple regression models.
2. Determine when the assumptions of the classical model are violated and how to correct an estimated model when the assumptions are not met.
3. Complete and econometric analysis that includes acquiring data, describing an econometric model, completing an econometric analysis, and evaluating results in a report.
4. Review and critique econometric analyses completed by other researchers.
5. Become proficient at using the STATA econometric software program.

Brief list of topics covered:

1. Ordinary least squares
2. Hypothesis testing
3. Classical model
4. Model specification
5. Violations of the classical model
6. Times series models
7. Other models and forecasting

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 and 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 available at:
http://inside.mines.edu/UserFiles/File/PoGo/Policies/STU/STU_Academic_Integrity_August2016.pdf.

Grading Procedures: There will be three exams, periodic homework and quizzes, and class participation is expected. The weights for each activity as a proportion of the total course grade are shown below.

4 Exams (15% each)	= 60%
Final Paper	= 30%
Homework, quizzes, participation	= 10%
Total	**= 100%**

Grades will be based on the following scale.

90%	-	100%	= A
80%	-	89%	= B
70%	-	79%	= C
60%	-	69%	= D
Less than 60%			= F

Coursework Return Policy: Exams, quizzes, and homework will be returned to the student no later than one week following the submission date. For example, an exam taken on a Tuesday will be returned no later than the following Tuesday. Corrections will be provided on the returned assignment.

Absence Policy (e.g., Sports/Activities Policy): An excused absence must be provided to the instructor at least one week before the absence to schedule make-up work for any missed assignments.

Homework and exams:

- Homework must be turned in when 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.

Detailed Course Schedule:

Weeks 1 through 4 - Basic model and hypothesis testing

1. Introduction and statistics review - Chapter 1 including Appendix 1.7, Handout
2. Ordinary Least Squares – Chapter 2
   - Simple single variable model
   - Multivariate model
   - What makes a good model?
3. How to perform and document econometric analyses – Chapter 3
4. Classical model – Chapter 4
   - Classical Assumptions

- Properties of OLS estimators

5. Hypothesis testing and inference – Chapter 5
   - t-tests
   - F-tests
   - Confidence intervals
   - Proper use of tests

Exam #1 – In class exam with one page of notes- Thursday February 9, 2017
Presidents' Day Break – Tuesday February 21, 2017

Weeks 5 through 8 – Class project/paper, model specification, violating classical assumptions

1. Discussion of class project/paper – Chapter 11
2. Model Specification/Functional Form – Chapters 6 and 7
   - Omitted variables
   - Irrelevant variables
   - Specification criteria
3. Multicollinearity – Chapter 8
   - What is it and what are the consequences?
   - How to detect it.
   - How to solve it.

Exam #2 – In class exam with one page of notes- Thursday March 16, 2017

Spring Break March 25th – April 2nd, No class March 28th and 30th

Weeks 9 through 11 - Violations of the Classical Model Assumptions (continued) and Time-Series Models

1. Serial Correlation/Autocorrelation – Chapter 9
   - What is it? Consequences, detection, and solution.
2. Heteroskedasticity – Chapter 10
   - What is it, consequences, detection, and solution.
3. Specification error and other issues – Handouts
4. Time – Series Models – Chapter 12
   - Koyck Lag model
   - Granger causality
   - Spurious correlation

Exam #3 – In class exam with one page of notes– Tuesday April 11, 2017

Weeks 12 through 14 – Additional models and paper presentations

1. Dummy Dependent Variable Models – Chapter 13
   - Linear probability model
   - Logit model

2. Simultaneous Equation Models – Chapter 14
   - Potential bias
   - Identification
   - Correction of bias
   - Two-Stage least squares

3. Forecasting – Chapter 15
   - What are the steps in forecasting?
   - ARIMA models

4. **Experimental and Panel Data – Chapter 16**
   - Fixed effects and random effects

Exam #4 – In class exam with one page of notes – Thursday April 27, 2017

Paper Presentations – Tuesday May 2nd and Thursday May 4th
Last day of class is May 4th
Papers must be handed in/emailed no later than Monday May 8th