

AREC\ECON 735  
Spring 2018

Econometric Theory II: Core Topics (details on the panel data module will follow)

TIME: 9:30-10:45 Tuesday-Thursday Clark C362

**Instructor:** Marco Costanigro

**Contact:**

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**Office Hours** Tuesday 2:00-3:30 pm and by appointment (PM hours)

Texts: **Required:** Microeconometrics: Methods and Applications by A.C Cameron and P. K Trivedi Cambridge University Press. 2005. ISBN: 0521848059

**Suggested:** Econometrics Analysis (sixth edition) by William Greene. Prentice Hall. ISBN: 0135132452

**Suggested:** Microeconometrics Using Stata, Revised Edition. by A.C Cameron and P. K Trivedi ISBN: 1597180734

Objectives:

1. Expand students' fundamental knowledge of econometric core methods beyond the classical linear model to include fully parametric, semi-parametric and non-parametric estimation methods.
2. In addition to technical proficiency, students will gain an understanding of the implications of the assumptions inherent to alternative estimators and modeling approaches; and the ability to use theory, sample and out of sample information to make appropriate methodological decisions
3. Students will acquire the broad foundation necessary to independently consult, comprehend and use advanced econometric models not explicitly treated in class.

Homework Exercises

I will assign 4-5 group homework exercises over the first 10 weeks of course. You may work in groups of *up to 4 people*. If you choose to work in a group, which is highly encouraged, please submit only one copy of each assignment with the names of the participants on the front.

Computer Software:

No specific econometric software is mandated, but homework assignments will imply the joint use of "canned" software (e.g. STATA) and a matrix environment software (e.g. Gauss or MATA). While I will provide some basic guidance, I expect students to use manuals and online help to self-teach the use of the chosen statistical software.

## Course Policies

1. **Homework exercises** are due on the stated due date. Beyond that, no assignments will be accepted.
2. If you have a **documented disability** that requires special arrangements, please let the instructor know immediately at the beginning of the course.
3. **Academic integrity** is expected. This course will adhere to the CSU Academic Integrity Policy as found on the Student' Responsibilities page of the [CSU General Catalog](#) and in the [Student Conduct Code](#). Violations will result in a report to the Office of Conflict Resolution and Student Conduct Services, and the full application of all relevant University policies.
4. Always show appropriate **respect** for your instructor and fellow students. This means, among other things, that **cell phones** should be muted prior to class.

Exams: This is a two credits course, concluded at the end of March. The first exam will be at mid-course. The second exam (comprehensive) will be one week after the end of the course (perhaps outside of class hours). I will discuss options with the class over the course of the semester.

### Course Evaluation:

As a default, the grades are as assigned as follows: A =  $\geq 90\%$ ; B = 80-89%; C = 70-79%; D = 60-69%; F =  $< 60\%$ . Pluses and minuses will be used at the discretion of the instructor.

### Grading

#### Rule A

Group Homework Exercises	30%
Exam I (75 min)	35%
Exam II (comprehensive, 2hours)	35%

#### Rule B

Group Homework Exercises	30%
Exam II (comprehensive, 2hours)	70%

I will use the highest score from calculating both Rule A and Rule B

Tentative course Timeline\_(subject to change at the discretion of the instructor)

Week	Date	Class	Topic	Notes	Homework
1	1/22/2018	1	Matrix review and Properties of Estimators	1	Warmup hW
1		2	Extremum estimator and NLS	2	
2	1/29/2018	3	Extremum estimator and NLS	2	HW1
2		4	Maximum Likelihood Estimation	3	
3	2/5/2018	5	Maximum Likelihood Estimation	3	
3		6	Maximum Likelihood Estimation	3	HW2
4	2/12/2018	7	Quasi-MLE and Sandwich Estimator	4	
4		8	Quasi-MLE and Sandwich Estimator	4	
5	2/19/2018	9	Quasi-MLE and Sandwich Estimator	4	
5		10	Numerical optimization	5	
6	2/26/2018	11	<b>Exam 1 (tentative)</b>		
6		12	Numerical optimization	5	
7	3/5/2018	13	Methods of Moments	6	
7		14	Methods of Moments	6	
8	3/12/2018	15	Methods of Moments	6	HW3
8		16	Wald, LM, LR tests	7	
9	3/19/2018	-	Spring Recess		
9		-			
10	3/26/2018	17	Power, sample size , pitmann-drift (if time allows)	7	
10		18	Nonparametrics	8	
11	4/2/2018	19	Nonparametrics and concluding remarks	8	HW4
11		20	Catch up and review/Exam		

**Table of references**

Topic	C&T	Micro with Stata	Greene
Estimation Frameworks in Econometrics			Chapter 14
Properties of Estimators (MJM E.2.1.4-5-6-7)			
Extremum Estimators	5.3 (124)		
Nonlinear Least Squares	5.8.1 (151)	10.3.5 (325)	
Maximum Likelihood	5.6		
Numerical Methods		11	
Testing	7		
GMM	6		
Nonparametrics	9		

## **Principles of Community**

The Principles of Community support the Colorado State University mission and vision of access, research, teaching, service and engagement. A collaborative, and vibrant community is a foundation for learning, critical inquiry, and discovery. Therefore, each member of the CSU community has a responsibility to uphold these principles when engaging with one another and acting on behalf of the University

### **Inclusion:**

We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents, and contributions.

### **Integrity:**

We are accountable for our actions and will act ethically and honestly in all our interactions.

### **Respect:**

We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

### **Service:**

We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

### **Social Justice:**

We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.