

Course: Topics in Advanced Econometrics

GRADO: Economics/Law and Economics/International Studies and Economics/Philosophy, Politics and Economics

YEAR: 3-4

SEMESTER: 1

COURSE CRONOGRAM

Week	Lecture	DESCRIPTION OF THE LECTURE'S TOPICS	GROUP (Mark X)		Classroom	STUDENT WORK DURING THE WEEK		
			Lecture	Recitation		DESCRIPTION	Number of Lecture Hours	Number of Hours of Work per Week
1	1	Causal relationships and partial effects: conditional expectations, linear projections and partial effects. Elasticities and semi-elasticities. Linear models vs nonlinear models.	X			Read Wooldrige Ch. 1	1,5	6
1	2	Exercises: Properties of conditional expectations and linear projections. Interpretation of partial effects in linear models and nonlinear. Average of the partial effects.		X		Homework on Problem Set 1.	1,5	
2	3	Basic asymptotic theory 1: Convergence in probability and distribution. Law of Large Numbers and Central Limit Theorems.	X			Read Wooldrige Ch. 3.1-3.4, Hayashi, Ch. 2.1	1,5	6
2	4	Exercises: Applications of Slutsky's and continuous map theorems. Consistency and asymptotic distribution of the sample moments.		X		Homework on Problem Set 1.	1,5	
3	5	Basic asymptotic theory 2: The principle of analogy. CAN estimators. The delta method.	X			Wooldrige. Ch. 3.5	1,5	6
3	6	Exercises: Asymptotic distribution of the functions of the sample means. Applications of the delta method.		X		Homework on Problem Set 1.	1,5	
4	7	Least Squares in the uniequational linear model 1: OLS, GCM and quasi-maximum likelihood. Asymptotic consistency and normality in classical and non-standard conditions.	X			Read Wooldrige. Ch. 4.1-4.2	1,5	6
4	8	Exercises: Asymptotic efficiency of the CGM and ML. Trending regressors.		X		Homework on Problem Set 2.	1,5	
5	9	Least Squares in the uniequational linear model 2: Segmented regression. Omitted variables, proxy variables and measurement errors.	X			Read Wooldrige. Ch. 4.3-4.4	1,5	6

5	10	Exercises: Asymptotic bias due to omitted variables and measurement errors.		X		Homework on Problem Set 2.	1,5	
6	11	Least Squares in the uniequational linear model 3. Consistent estimation of the covariance and asymptotic variance standard and non-standard conditions. Confidence interval.	X			Read Wooldrige Ch. 4.3-4.4, Hayashi Ch. 2.5	1,5	6
6	12	Exercises: estimators of the residual variance. Asymptotic inference when innovations are autocorrelated in an unknown way.		X		Homework on Problem Set 2.	1,5	
7	13	Contrasting linear constraints on parameters in the uniequational model 1: Linear constraints and constrained least squares. Consistency, asymptotic power, local alternatives and efficiency. Wald contrast.	X			Read Wooldrige. Ch. 3.4, 4.2, 6.2, Hayashi Ch 2.4, 2.6, 3.7.	1,5	6
7	14	Exercises: Derivation of the asymptotic distribution of the restricted least squares. Derivation of the asymptotic distribution of Wald contrast in local alternatives.		X		Homework on Problem Set 3.	1,5	
8	15	Contrasting linear constraints on the parameters in the uniequational model 2: Likelihood Ratio and Lagrange Multiplier. Contrasts for homoscedasticity and absence of autocorrelation.	X			Read Wooldrige. Ch. 3.4, 4.2, 6.2, Hayashi Ch 2.4, 2.6, 3.7.	1,5	6
8	16	Exercises: Comparison between contrasts.		X		Homework on Problem Set 3.	1,5	
9	17	MIDTERM EXAM	X			EXAM	1,5	6
9	18	Estimation of instrumental variables in the uniequational linear model 1: Identification and instruments. Rank and order conditions. Consistency and asymptotic normality of MC2E.	X			Read Wooldrige Ch. 5.1-5.2. Hayashi Ch. 3.1-3.3	1,5	
10	19	Exercises: Asymptotic distribution of MC2E under non-standard conditions. Asymptotic variance estimator.		X		Homework on Problem Set 3.	1,5	6
10	20	Estimation of instrumental variables in the uniequational linear model 2: Inference with MC2E. Weak instrument and efficiency problems. Endogeneity tests and overidentification restrictions.	X			Read Wooldrige Ch. 5.2	1,5	
11	21	Exercises: Asymptotic efficiency of MC2E. Implementation of endogeneity contrast and overidentification restrictions.		X		Homework on Problem Set 4.	1,5	6

11	22	Linear equation systems 1: OLS and GCM in SUR models. Feasible CGM. Contrasting constraints in the equations.	X			Read Wooldrige Ch 7	1,5	
12	23	Exercises: Efficiency in SUR models. Inference in SUR models. Exercises: Program CGM in a SUR model using R.		X		Homework on Problem Set 4.	1,5	6
12	24	Linear equation systems 2: Identification in models of simultaneous equations with exclusion and general restrictions. MC2E equation by equation. MC2E vs MC3E.	X			Read Wooldrige Ch. 8, 9.1-9.5. Hayashi Ch. 4.1-4.5	1,5	
13	25	Exercises: Asymptotic distribution of the MC3E. Contrasts of linear constraints.		X		Homework on Problem Set 4.	1,5	6
13	26	Extreme Estimators 1: Maximum conditioned likelihood, non-linear least squares, GMM. ID. Asymptotic properties of extreme estimators. Numeric optimization	X			Read Wooldrige Ch. 12.1-12.3 Hayashi 7.1-7.3	1,5	
14	27	Exercises: Examples of models with limited dependent variable. Logit, Tobit and Count.		X		Study for the exam	1,5	6
14	28	END-OF-TERM EXAM				EXAM	1,5	
SUBTOTAL								126
15		Make ups, tutoring, homework assignments, etc.						8
16-18		Final exam/Studying for the final exam.					16	
TOTAL								150