

Course: Time Series Econometrics in Energy

GRADO: Energy Engineering

YEAR: 3

SEMESTER: 2

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	Overall description of the course on energy models and econometric modeling	X			Reading lecture notes and solving exercises	1,5	5
1	2	Examples: working with Eviews and discussion about how to write an empirical project		X		Presenting and discussing exercises with Eviews: How to download data from data bases (FRED, etc.)	1,5	
2	3	Quick overview of Univariate time series models. Stationary and nonsationary trending variables. AR models and MA models: Identification and estimation	X			Reading lecture notes and solving exercises	1,5	5
2	4	Exercises on stationarity and nonstationarity evolutions: Plotting Economic variables and their log transformations with Eviews		X		Presenting and discussing the solutions to exercises and homework.	1,5	
3	5	Overview of univariate ARMA and ARIMA time series models and unit root tests; impulse response effects of permanent and transitory shocks: I	X			Reading lecture notes and solving exercises assigned.	1,5	5
3	6	Exercises on identification and estimation of ARIMA models and unit root tests with the Eviews program: I		X		Presenting and discussing the solutions to exercises and homework.	1,5	
4	7	Overview of univariate ARMA and ARIMA time series models and unit root tests; impulse response effects of permanent and transitory shocks: II	X			Reading lecture notes and solving exercises assigned.	1,5	5
4	8	Exercises on estimation of ARIMA models and unit root tests with the Eviews program: II		X		Presenting and discussing the solutions to exercises and homework.	1,5	
5	9	Unobserved components: Trends and cycles. Hodrick-Prescott (HP) filter, comovements through the business cycles: Empirical regularities	X			Reading lecture notes and solving exercises assigned.	1,5	5

5	10	Exercises using HP filter for different smooting conditions and testing for comovements between cyclical energy variables		X		Presenting and discussing the solutions to exercises and homework.	1,5	
6	11	Internacional evolution of energy prices	X			Reading lecture notes and solving exercises assigned.	1,5	5
6	12	Exercises on price evolution and on absolute beta and sigma convergence regressions		X		Presenting and discussing the solutions to exercises and homework. Student presentations of their proposal for the empirical project	1,5	
7	13	Structural breaks and unit roots tests. Asymmetric AR models, threshold AR models, Smooth transition AR models (LSTAR an ESTAR)	X			Reading lecture notes and solving exercises assigned.	1,5	5
7	14	Exercises: Testing for unit roots with breaks and on alternative empirical nonlinear AR models		X		Presenting and discussing the solutions to exercises and homework.	1,5	
8	15	Estimation and testing for structural changes, nonlinearities and decision rules for selecting LSTAR and ESTAR	X			Reading lecture notes and solving exercises assigned.	1,5	5
8	16	Exercises: Model estimation with dummy variables. nonlinearities and empirical applications with Eviews		X		Presenting and discussing the solutions to exercises and homework.	1,5	
9	17	Volatility and conditional heteroskedasticity: ARCH, GARCH, theshold and exponential ARCH models (T-ARCH and E-GARCH)	X			Reading lecture notes and solving exercises assigned.	1,5	5
9	18	Exercises on volatility and ARCH with Eviews: leverage effects and diagnostic test				Presenting and discussing the solutions to exercises and homework.	1,5	
10	19	Quick overview of single equation regression models: Heteroskedasticity and autocorrelation consistent (HAC) stand errors, endogeneity, IV-variables, measurement errors, coefficient interpretation, misspecification and general to specific modeling	X			Reading lecture notes and solving exercises assigned.	1,5	5
10	20	Exercises on single equation macroeconomic modeling: Exercises on conditional beta and sigma convergence regressions		X		Presenting and discussing the solutions to exercises and homework.	1,5	
11	21	Single equation dynamic energy models: Autoregressive distributed lag (ARDL) models, common factor restrictions and error correction representation	X			Reading lecture notes and solving exercises assigned.	1,5	5
11	22	Exercises on single equation macroeconomic modeling with Eviews		X		Presenting and discussing the solutions to exercises and homework.	1,5	

12	23	Dynamic multipliers, cointegration, error correction models (ECM), Engle and Granger test, Fully modified estimation and nonlinear error correction (NEC) models	X			Reading lecture notes and solving exercises assigned.	1,5	5
12	24	Empirical applications		X		Presenting and discussing the solutions to exercises and homework.	1,5	
13	25	Empirical applications	X			Reading lecture notes and solving exercises assigned.	1,5	5
13	26	Empirical applications		X		Presenting and discussing the solutions to exercises and homework.	1,5	
14	27	Empirical applications	X			Reading lecture notes and solving exercises assigned.	1,5	5
14	28	Empirical applications		X		Presenting and discussing the solutions to exercises and homework.	1,5	
SUBTOTAL								120
15		Make ups, tutoring, homework assignments, etc. Students presentations of their empirical projects				Presenting and discussing student presentations of empirical projects.		8
16-18		Final exam/Studying for the final exam.					3	19
TOTAL								150