

CBN COLLABORATIVE POSTGRADUATE PROGRAMME
DEPARTMENT OF ECONOMICS, UNIVERSITY OF NIGERIA NSUKKA
WORK PLAN

NAME OF LECTURER:

COURSE: ECO 506 ECONOMETRIC THEORY AND PRACTICE

STUDY WEEK	TOPIC SUB-TOPIC	RESULTS LEARNING	TIME Hrs	METHODS	Suggested Videos
Summary					
1	<p>Overview of Classical Regression</p> <p>1.1 Definition, Scope and Methodology of Econometrics</p> <p>1.2 Types of Econometrics and their applications in Economics</p> <p>1.3 Statistical versus deterministic relationship and Regression versus Causation</p>	<p>The students will be able to:</p> <ul style="list-style-type: none"> ▪ Define econometrics ▪ Describe the scope of coverage of econometrics ▪ Explain the basic methodology of econometrics. ▪ Identify and explain different types of econometrics ▪ Apply econometrics to simple economic issues ▪ Explain the difference between regression and causation ▪ Explain differences between correlation and causation ▪ Explain difference between correlation and regression ▪ Explain what constitute deterministic relationship 	3	Face-to-face interaction and presentations	There are many good videos available on the Internet.
2	Estimation Principles		3		

	2.1 Least Squares Principle	<p>The students will be able to:</p> <ul style="list-style-type: none"> ▪ Define and justify least square principle ▪ Estimate least square parameters ▪ Explain what least square is and what constitute its estimates ▪ Explain the reason for using least square method. 		Face-to-face interaction and presentations	There are many good videos available on the Internet.
2.2 The Maximum Likelihood Principle	<ul style="list-style-type: none"> ▪ Explain the meaning of maximum likelihood ▪ What constitute maximum likelihood detector ▪ Describe maximum likelihood phylogenetic tree 				
2.3 Method of Moments (MM) and Generalized Method of Moments (GMM) Principles	<ul style="list-style-type: none"> ▪ Show whether maximum likelihood estimator is unbiased or not. ▪ Properties of maximum likelihood. 				
2.4 Nonlinear Least Squares	<ul style="list-style-type: none"> ▪ Show how the GMM estimators are derived ▪ Explains the relevance of instrumental variable in GMM ▪ Outline the properties of GMM and advantages over least square method ▪ Explain what non-linear regression means in statistics ▪ What constitute non-linear trend ▪ Compute non-linear estimates 				

<p>3</p>	<p>Model Specification, Selection and Evaluation</p> <p>3.1 Model Specification.</p> <p>3.1.1. Model Selection</p> <p>3.1.2 Model Evaluation</p>	<p>Student will be able to:</p> <ul style="list-style-type: none"> ▪ Choice the correct regression model ▪ Familiarise with statistical methods for model specification ▪ Understand the Real World Complications in the Model Specification Process ▪ Explain model specification errors. ▪ Recognize types and results of model specification errors ▪ Grasp the theoretical and Practical basis for Model Specification ▪ List the methods and criteria for model selection ▪ Have overview of model selection techniques ▪ Understanding of the model evaluation techniques for classification of models ▪ Have understanding of the important model evaluation error metrics ▪ Identify and explain the general steps in model evaluation ▪ Present approaches to assessing and enhancing the progress of applied economic research 	<p>3</p>	<p>Face-to-face interaction and presentations</p>	<p>There are many good videos available on the Internet.</p>
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4-6	<p>Time Series Analysis</p> <p>4.1 Concepts of Stationarity and Non-Stationarity</p> <p>5.1 Univariate Time Series Models</p> <p>6.1 Multivariate Time Series Models</p>	<ul style="list-style-type: none"> • Stationary Stochastic Processes: World Decomposition Theorem • Univariate Time Series Analysis: AR, MA and ARMA • ARIMA Modelling and Forecasting • Lag Length Selection • Forecasting Univariate Time Series • Stationary VAR (Specification, Estimation and Variance-Covariance Decomposition) • Integrated Variables and Unit Root Testing • Structural Break and Unit Root Testing • Co-integration and Error-Correction Models; (Engle-Granger Error Correction Models; Engle and Yoo; ARDL approach to co-integration test) • Dynamic OLS (DOLS) and Fully Modified OLS (FMOLS) • Non-stationary multivariate linear models: VAR models with unit roots-co-integration and impulse response functions; Testing and estimation of the co-integrating vector and the VECM 	9	Face-to-face interaction and presentations	There are many good videos available on the Internet.
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7-8	Financial Econometrics 7.1 Autoregressive Conditional Heteroscedastic (ARCH) Models 8.1 Generalized Autoregressive Conditional Heteroscedastic (GARCH) Models and Extensions	Students will be able to: <ul style="list-style-type: none"> ▪ Understand the fundamental relevance of ARCH models ▪ describe, model and apply ARCH techniques to financial series ▪ Understand the procedure for GARCH modelling ▪ describe, model and apply GARCH techniques to financial series ▪ Have understanding of the application of ARCH and GARCH in applied economics ▪ Benefit from Practical sessions, computer applications with the help of statistical Software, Case Study analysis and Quizzes. 	6	Face-to-face interaction, presentations and computer application practices	
9-11	Discrete Choice Models 9.1 Binary Choice Models (LPM, Logit, and Probit) 10.1 Multi-Response Models <ul style="list-style-type: none"> • Conditional and Multinomial Logit Regressions • Nested Logit Regression 11.1 * Multinomial Probit Regression *Ordered Choice Models	<ul style="list-style-type: none"> • Apply binary choice models to real life situation • Describe, specify and model various forms of Binary models. • Apply statistical software to estimate and interpret various forms of Binary model to include LPM, Logit and Probit • Explain • 	9	Face-to-face interaction, presentations and computer application practices	
12-13	Panel Data Analysis		6		

	<p>12.1 Regression with Pooled Time Series/Cross-Section Data</p> <p>12.2 Static Panel Models</p> <p>12.3 Dynamic Panel Models</p> <p>13.1 Non-Stationarity, Unit Roots and Co-integration in Panels</p>	<p>Student will be able to:</p> <ul style="list-style-type: none"> ▪ describe, specify and model a panel regression. ▪ differentiate between pooled, fixed and random effect model ▪ Define and specify a Static Panel models. ▪ Grasp Static panel models variation such as fixed effects and random effects. ▪ Define and specify a DPM. ▪ Grasp the implications of DPM for the choice of choosing between fixed and random effects. ▪ Understand the uniqueness of IV (Instrumental Variable) approach, 2SLS, 3SLS and Panel GMM ▪ Define and specify a panel Stationarity unit root process. ▪ Apply and model panel co-integration. ▪ Apply statistical softwares to detect a co-integration in panel. 	1.5	Face-to-face interaction, presentations and computer application practices	
14	REVISION WEEK				
15	EXAMINATION				

Lecturer:

PROGRAMME LEADER