هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Introduction to Econometrics**
Course Code:	**STA 1423**
Program:	**Bachelor of Science in Applied Statistics**
Department:	**Mathematics and Statistics**
College:	**Science**
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	**2024 – V1**
Last Revision Date:	**2 October 2024**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 (2 Lectures, 1 Lab, 1 Tutorial)					
2. Course type					
A.	☐University	☐College	☒ Program	☐Track	☐Others
B.	☐ Required		☒ Elective		
3. Level/year at which this course is offered: (……)					
Level 7 / Year 4					
4. Course General Description:					
This course covers the statistical tools needed to understand empirical economic research and to plan and execute independent research projects. Topics include statistical inference, regression, generalized least squares, instrumental variables, simultaneous equations models, and evaluation of government policies and programs.					
5. Pre-requirements for this course (if any)**:**					
STA 1322					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
▪ **Give students theoretical and practical background on the use of statistical models in the econometrics.** ▪ **Student knows how to build or construct the economic model and economic relations.** ▪ **Discuss the concept of dummy variables and general form of multi-regression model.** ▪ **Econometrics problems and how to remedy it.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**60**	**100%**
2	E-learning	**0**	**0%**
3	Hybrid • Traditional classroom • E-learning	**0**	**0%**
4	Distance learning	**0**	**0%**

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	15
3.	Field	0
4.	Tutorial	15
5.	Others (specify)	0
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	To state simple and multiple linear regression models.	K1, K2	2 lecture hours per week Classroom discussions	**Direct:** Regular Exams
1.2	To outline the nature and the results of heteroscedasticity	K2, K3	1 tutorial hour per week 1 lab hour per week	**Direct:** Regular Exams Lab Assignments Short Quizzes
1.3	To define basic concepts in time series econometrics.	K1, K3	2 lecture hours per week Classroom discussions	**Direct:** Regular Exams
2.0	Skills			
2.1	To compute elasticities empirically and make an interval estimation.	S1, S2	Self-study Real-life problems	**Direct:** Participations, Lab Exam, Short Quizzes
2.2	To apply the methods for adding more flexibility to the regression model.	S1, S2	Real-life problems	**Direct:** Short Quizzes
2.3	To generate forecasts by using regression results and propose other analyzing methods when the regression analysis is not enough.	S3, S4	Self-study	**Direct:** Lab Exam Participations
2.4	To explain the nature of dynamic econometric models.	S2, S4	Self-study Real-life problems	**Direct:** Regular Exams
2.5	To evaluate the output created by the software.	S4, S5	1 lab hour\week	**Direct:** Participations, Lab Exam, Short Quizzes
3.0	Values, autonomy, and responsibility			

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.1	**To apply ethical concepts and rules to determine viable alternatives in any given situation.**	**V1, V2**	**Personal questions**	**Direct:** Participation Lab Exam,
3.2	**To operate meaningfully and productively with others.**	**V1, V2**	**Teamwork and class discussions.**	**Direct:** Homework Mini projects

C. Course Content

No	List of Topics	Contact Hours
1	**Introduction:** Review of multiple regression models. Interpretation of Ordinary least squares (OLS). Obtaining OLS estimates. The mean and variance of OLS.	**4**
2	**Nonlinear models:** Linearity and nonlinearity. Logarithmic transformations. Models with quadratic and interactive models. Nonlinear regression.	**5**
3	**Dummy variables:** Illustration, Extension to more than two categories and to multiple set. Slope dummy variables. Chow test.	**5**
4	**Specification of regression variables:** Model specification. Effect of omitting a variable. Effect of including a variable. Proxy variables. Testing a linear restriction, Getting the most out of the residuals.	**6**
5	**Heteroscedasticity:** Heteroscedasticity and implications. Detection. Remedies.	**9**
6	**Stochastic Regressors and Measurement Errors:** Assumptions for models. Finite sample properties. Asymptotic properties. Measurement errors. Instrumental variables.	**8**
7	**Simultaneous Equations Estimation:** Models. Bias. Instrumental variables estimation.	**9**
8	**Models Using Time Series Data:** Assumptions. Static models. Models with lagged explanatory variables. Models with a lagged dependent variable. Properties of estimators. Simultaneous equations models.	**9**
9	**Autocorrelation:** Definition and consequences. Detection of autocorrelation. Fitting a model subject. Model specification.	**5**
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**HomeWorks, Quizzes, Mini projects**	**During the term**	**10%**
2.	**First Midterm**	**Week 5-6**	**25%**
3.	**Second Midterm (Lab Exam)**	**Week 10-11**	**25%**

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Final Exam	Week 16-17	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	***Introduction to Econometrics*;** 5th Edition, Christopher Dougherty, Oxford Press, 2016. ISBN: 9780199676828 (Main Reference).
Supportive References	**1-** ***Introduction to Econometrics***, 3rd Edition, James H. Stock, Mark W. Watson, Addison-Wesley Series in Economics, 2010. **2-** ***Introductory Econometrics: A Modern Approach***, Jeffrey M. Wooldridge, Pearson, 2008 **3-** ***Econometric Methods*,** 4th Edition, J. Johnston and John DiNardo, McGraw-Hill, 1997. **4-** ***Econometric*,** R. J. Wonnacott and T. H. Wonnacott, 2nd Edition, John Wiley, Wiley Series in Probability and Statistics - Applied Probability and Statistics Section, 1979.
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	▪ **Each class room should be equipped with a whiteboard and a projector.** ▪ **Laboratories should be equipped with computers and an internet connection.**
Technology equipment (projector, smart board, software)	**The rooms should be equipped with data show and Smart Board.** **All computers should be equipped with the following software:** ▪ **Microsoft Excel** ▪ **IBM SPSS** ▪ **R-Project** ▪ **MATLAB**
Other equipment (depending on the nature of the specialty)	**None**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student and teaching staff	Surveys and Questionnaires
Effectiveness of Students assessment	Course Coordinator	Peer Reviews
Quality of learning resources	Students and teaching staff	Classroom Observations
The extent to which CLOs have been achieved	Student Representatives	Student Performance Evaluations (exams, projects) CLOs Excel sheet.
Other	None	

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL
REFERENCE NO.	8/1446
DATE	(08/10/2024) 05/04/1446