

Course Title:	Econometrics
Course Code:	STAT-407
Semester:	VIII
Credit Hours:	3 Credit Hours
Pre-requisites:	N / A

### Learning Outcomes

On successful completion of this course, students will be able to:

1. Research with econometrics
2. Explain econometrics concepts and results intuitively
3. Derive econometric results mathematically

### Course Contents

#### 1- Foundations of Econometrics

Significance of econometrics and data types, The Econometric Process and Model Building (Nature, methodology and functions)

#### 2- Simple Linear Regression

Understanding Regression Analysis and derivation, Understanding the assumptions of Classical Linear Regression Model, Derivation of the variance of OLS estimators, BLUE property of OLS estimators; Concept and Proof, Hypothesis Testing in Simple Linear Regression

#### 3- Multiple Linear Regression

Linear Regression Model and derivation of OLS estimators, Derivation of variance, BLUE property of OLS estimators; Concept and Proof, Hypothesis Testing and Inference in Multiple Regression, F-test, Chow test

#### 4- Violation of Assumptions, Consequences, Detection and Remedies

Multicollinearity, Causes of Multicollinearity, Consequences of Multicollinearity, Detection of Multicollinearity, Remedial Measures of Multicollinearity.

Non-Spherical Disturbances, Variance-covariance Matrix, Aitken Theorem.

Autocorrelation, Types and causes of autocorrelation, Consequences of autocorrelation, Detection of autocorrelation, Remedial Measures.

Heteroscedasticity, Causes of Heteroscedasticity, Consequences of Heteroscedasticity, Detection of Heteroscedasticity, Remedial Measures.

#### 5- Simultaneous Equations System

Overview of Simultaneous equations system, Concept of exogenous and endogenous variables, Concept of reduced form equations, Identification of simultaneous equations (order and rank conditions), Method of Estimation for identified equations, Indirect Least squares Method, Two-stage Least squares Method, Least Variance Ratio.

- **Teaching-learning Strategies:**

Class Lecture method, which includes seminars, discussions, assignments and projects. (Audio-visual tools are used where necessary)

- **Assignments-Types and Number with calendar:**

According to the choice of respective teacher.

- **Assessment and Examinations:**

According to the University's Semester Rules.

Sr. No.	Elements	Weightage	Details
1	Midterm Assessment	35%	It takes place at the mid-point of the semester.
2	Formative Assessment	25%	It is continuous assessment. It includes: Classroom participation, attendance, assignments, and presentations, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

### Textbook

Wooldridge, J. M., Wadud, M., & Lye, J. (2016). *Introductory econometrics: Asia pacific edition with online study tools 12 months*. Cengage AU.

### Suggested Readings

1. Stock, J. H., & Watson, M. W. (2020). *Introduction to econometrics*. Pearson.
2. Gunst, R. F. (2018). *Regression analysis and its application: A data-oriented approach*. New York: Routledge.
3. Seddighi, H. (2013). *Introductory econometrics: a practical approach*. Routledge.
4. [Peck](#), E. A., [Vining](#), G., & [Montgomery](#), D. C. (2012). *Introduction to Linear Regression Analysis* (5th ed.). Wiley.
5. Gujrati, D. (2003). *Basic Econometrics* (4<sup>th</sup> ed.). McGraw Hill Book Company.