School of Business and Economics
Department of Economics

Course Name	**Introduction to Econometrics**
Course Code & Section No.	**ECO 372; Section: 1**
Semester	**Spring 2025**

INSTRUCTOR AND DEPARTMENT INFORMATION

Instructor Name	**Sakib Bin Amin, Ph.D.** *Associate Professor (Economics)*
Office	NAC 830 (B)
Office Hours	**MW: 1.00 PM-2.30 PM** **Tuesday: 4.00 PM-7.00 PM** or by appointment
Office Phone	+880-2- 55668200, Ext: 1818
Email Address	sakib.amin@northsouth.edu Please include your Name, NSU ID number, and section when emailing me. The subject line must always include "ECO 372.1" along with a summary of the topic(s) that will be covered in the main body, such as "***Missed Class***", "A***ppointment***", etc.
Department	**Economics**

COURSE AND SECTION INFORMATION

Class Time & Location	**MW 02:40 PM-04:10 PM at NAC 401**
Course Prerequisite(s)	ECO 135, ECO 173
Course Credit Hours	3:0
Course Description	Eco 372 is the introductory course in econometrics. In this course, students learn about several techniques for data analysis in economics and related fields, including multiple regression analysis. This course has an applied and theoretical focus. Students will understand the theoretical aspects of different statistical models, their assumptions, and how to incorporate them to address and test economic theories and hypotheses. Using the statistical software STATA or EViews, students will also work with real data sets and apply the theoretical knowledge they have learned.

PROGRAM LEARNING OUTCOMES (PLOs):

PLO1	Be ***equipped with*** substantial knowledge of econometrics and analytical applications for business in industries.
PLO2	***Analyze*** business issues and make logical decisions based on the knowledge of economic science.
PLO3	***Assess*** the business environment, its market structures, and the strategies necessary with a solid foundation in econometrics.
PLO4	***Perform*** quantitative analysis of business-related issues using econometric tools and methods.
PLO5	***Apply*** econometric models to make better decisions from the operational aspects of any business in any particular industry

COURSE LEARNING OUTCOMES (CLOs):

CLO1	***Compare*** and ***contrast*** different models.
CLO2	***Engage*** in the key theoretical ideas that have shaped the evolution of econometrics.
CLO3	***Interpret*** the relevance of key concepts related to econometrics.
CLO4	***Apply*** economic reasoning to assess the implications and levels of efficacy of various policy instruments through econometric modelling

MAPPING PLO vs CLO:

PLO/CLO	CLO1	CLO2	CLO3	CLO4
PLO1	✓	✓	✓	✓
PLO2	✓	✓		✓
PLO3	✓	✓	✓	✓
PLO4	✓		✓	✓
PLO5	✓		✓	✓

TEXTBOOKS

The **required textbook** for the course is:
1. **Gujarati**, D. N., & **Porter**, D. C. (2009). *Basic Econometrics*. McGraw-hill.
2. **Stock** J., & **Watson** M. W. (2019) *Introduction to Econometrics* (4th Edition), Pearson 2019.
The **supplementary textbook** for the course is:
1. **Maddala**, G. S., & **Lahiri**, K. (1992*). Introduction to Econometrics*. New York: Macmillan.
2. **Greene**, W. H. (2003). *Econometric Analysis*. Pearson Education India.

The lecture slides for each lecture can be downloaded from Canvas. It will not be possible to cover all the material in the course of the lectures in detail. So, students are advised to go through the textbook and other recommended books. A handout will be provided if any reference beyond the suggested text is given.

TEACHING STRATEGIES

There are ***2 lectures per week*** in the **Spring 2025** term. The exam questions will be designed based on class lectures, discussions, relevant chapters from the textbook, additional readings, and academic articles. Students are encouraged to read the relevant chapters carefully to raise problems in the following lectures. The format of the questions will be analytical in nature. Students also need to submit a Term Paper at the end of the semester, and the maximum word limit is 5000 words. A term Paper is an independently or group-wise prepared essay exploring a topic in-depth by analysing data and presenting reasoned arguments that support an analytical framework and/or critically evaluated evidence, including policy evaluation. The project will be based on the application of econometric techniques learned in this course using statistical software named STATA or EViews. The maximum group size for this assignment is three. Instructions will be given in due time. **The title of the term paper is to be distributed in Week 7**. Selected term papers will be further polished for publication opportunities.

2 hours will be provided for student consultation in a week per section. The consultation hours give the students the chance to raise their questions and identify and overcome common problems.

ASSESSMENT (Subject to Change)

There will be **2 midterm examinations**, **3 quizzes**, **1 term paper**, and the **final examination**. The schedule will be announced/discussed in class.

GRADING (Subject to Change)

Course Grades will be determined as follows:

Attendance	5%
Quizzes (Best 2 out of 3)	10%
Midterm Examination-1	20%
Midterm Examination-2	20%
Term Paper	15%
Final Examination	30%

Course Grades will be based on a curve system. According to this system, a student's position determines his/her overall letter grade. NSU's grading and performance evaluation policies will be followed in assigning your grade.

COURSE CONTENTS:

Topics	CLOs
1. Introduction: What is Econometrics	CLO1
2. Review of Probability and Statistics	CLO1; CLO2; CLO3
3. Linear Regression with One and Multiple Regressors	CLO1; CLO2; CLO3; CLO4
4. Assumptions of Classical Linear Regression	CLO1; CLO2
5. Hypothesis Tests and Confidence Intervals Important Concepts-I (Multicollinearity, Correlation, Covariance, Endogeneity, Omitted Variables, Etc.)	CLO1; CLO2; CLO3; CLO4
6. Important Concepts-II (*Heteroskedasticity, Homoskedasticity, Slope Homogeneity, Robust Standard Errors, Small and Large Sample Properties, Efficiency, Etc.)*	CLO1; CLO2; CLO3; CLO4
7. Endogeneity and Emergence of Instrumental Variable Regressions	CLO1; CLO2; CLO3; CLO4
8. Dummy Variables in Econometric Modelling	CLO1; CLO2; CLO3; CLO4
9. Interactions in Regressors and Joint Effects; Introduction of Non-Linearity in Model Specifications	CLO1; CLO2; CLO3; CLO4
10. Discrete and Limited Dependent Variable Models	CLO1; CLO2; CLO3; CLO4
11. Time Series Modelling and Forecasting	CLO1; CLO2; CLO3; CLO4
12. Panel Data Econometrics	CLO1; CLO2; CLO3; CLO4

MAPPING⁄ ALIGNMENT OF CLOs VS ASSESSMENT STRATEGY:

CLOs/Assessment methods	Quizzes	Midterm exams	Term Paper	Final Exam
CLO1	✓	✓	✓	✓
CLO2	✓	✓	✓	✓
CLO3	✓	✓	✓	✓
CLO4	✓	✓	✓	✓
CLO5	✓	✓	✓	✓
CLO6	✓	✓	✓	✓

CLASS ETIQUETTE:

Discussion is one of the finest ways to learn and appreciate the relevance of the subject matter. You are highly encouraged to ask questions about specific topics and relevant current events. Since the goal of this course is to build your economic intuition, you are especially encouraged to challenge me when a particular point sounds counterintuitive. Your behaviour in the classroom can affect the learning experience for others in the classroom. Toward these ends, please adhere to the following guidelines:

1. Be on time for class and stay the entire class time.
2. Attendance is strongly recommended. The materials are cumulative in nature, so if a student misses some lectures, he or she will not make sense of subsequent lectures. So, skip at your own risk!
3. Talking, sleeping, Facebooking, reading the newspaper or materials other than those for this class, or working on other assignments and any other activities not related to this class are strictly prohibited.
4. Cell phones should be kept in silent mode before class begins.
5. There will be no **make-up Mid-term exam** if missed. However, if there is a major circumstance that prevents the student from taking any of the two (not both) Mid-term exams, the student may be allowed to appear in a make-up Mid-term exam. Student(s) must provide me with official documents that prove their reason for missing the Mid-term exam. If permission is granted, the date and time of the make-up exam will be set by the instructor and the student is asked to contact the instructor for further information.
6. There will be **NO make-up for the quiz (es).**

Tentative Class Schedule for ECO 372.1 (Subject To Change)

Lecture No.	Date & Day	Topic	Relevant Chapters
1	**January 20, Monday**	General Discussion	-
2	22, Wednesday	Introduction: What is Econometrics	1
3	27, Monday	Review of Probability and Statistics	2,3
4	29, Wednesday	Linear Regression with One and Multiple Regressors Assumptions of Classical Linear Regression	4,6
5	**February 03, Monday**	Hypothesis Tests and Confidence Intervals	5,6,7
6	05, Wednesday	Important Concepts-I (Multicollinearity, Correlation, Covariance, Endogeneity, Omitted Variables, etc.)	5,6,9
7	10, Monday	Important Concepts-II (Heteroskedasticity, Homoskedasticity, Slope Homogeneity, Robust Standard Errors, Small and Large Sample Properties, Efficiency, Etc.)	5,9
8	12, Wednesday	***Quiz-1***	***(Lectures:2-6)***
9	13, Thursday	**Overall Review and Recap for Midterm Examination-1**	-
10	17, Monday	***Midterm Examination***	***(Lectures: 2-7)***
11	19, Wednesday	Endogeneity and Emergence of Instrumental Variable Regressions-I	12
12	24, Monday	Endogeneity and Emergence of Instrumental Variable Regressions-II	12
13	26, Wednesday	Dummy Variables in Econometric Modelling	5
14	**March 03, Monday**	Interactions in Regressors and Joint Effects Introduction of Non-Linearity in Model Specifications	8
15	05, Wednesday	Discrete and Limited Dependent Variable Model	11
16	10, Monday	***Quiz-2***	***(Lectures: 11-14)***
17	12, Wednesday	***Overall Review and Recap for Midterm Examination-2***	
18	17, Monday	***Midterm Examination-2***	***(Lectures: 11-15)***
19	19, Wednesday	Time Series Modelling and Forecasting: History of Time Series Modelling Time Series Econometrics: Univariate Modelling	15
20	24, Monday	Time Series Econometrics: Univariate Modelling	15
21	**April 07, Monday**	Time Series Econometrics: Multivariate Modelling	15
22	09, Wednesday	Time Series Econometrics: Multivariate Modelling	15
23	16, Wednesday	***Quiz-3*** Panel Data Econometrics: Traditional Estimators	***(Lectures: 19-22)*** 10
24	20, Sunday	Panel Data Econometrics: Traditional Estimators	10
		Final Exam (23rd April- 29th April)	***(Lectures:18-24; 11-15)***

**The instructor reserves the right to change the course outline and schedule if necessary.*

ADDITIONAL READINGS (OPTIONAL):

1. **Amin, S.B**., Nepal, R., and Phoumin, H., 2022, "An Econometric Assessment of the Effects of Energy Market Reforms on Bangladesh Economy", in the book titled, Revisiting Electricity Market Reforms Lessons for ASEAN and East Asia, edited by Phoumin, H., Nepal, R., Kimura, F., Uddin, G.S., and Taghizadeh-Hesary, F., Springer Nature International.
2. **Amin, S.B.,** Khan, F., and Samia, B.I., 2024, "Does Capital Efficiency Influence Economic Growth in Bangladesh? Application of the Harrod-Domar Model", *Journal of Economics, Finance and Administrative Science,* DOI 10.1108/JEFAS-06-2021-0096 .
3. **Amin, S.B.,** Jamasb, T., Khan, F., and Nepal, R., 2024, "Electricity Access, Gender Disparity, and Renewable Energy Adoption Dynamics: The Case of Mountain Areas of Bangladesh", *Economics of Energy and Environmental Policy*, Volume 13, Issue 1, pp. 121-138.
https://www.iaee.org/en/publications/10.5547/2160-5890.13.1.sami
4. **Amin, S.B.,** Khan, F., Rahman, F.M**.,** and Taghizadeh-Hesary, F., 2024, "Does Technology Have a Lead or Lag Role in Economic Growth? The Case of Selected Resource-Rich and Resource-Scarce Countries", *Resources Policy*, Volume 89, February 2024. https://doi.org/10.1016/j.resourpol.2023.104558
5. **Amin, S.B.,** Taghizadeh-Hesary, F., Al Kabir, F., and Khan, F., 2022, "Nexus between Energy Intensity and Capital-Output Ratio: A Holistic Approach", *Energy & Environment*, https://doi.org/10.1177/0958305X221115489
6. **Amin, S.B.,** Azreen, A.B., Harvie, C., and Nepal, R., 2021 "The Nexus between Energy and Trade in South Asia: A Panel Analysis", Economic Papers, Volume 40, Issue 2. pp. 134-151. https://doi.org/10.1111/1759-3441.12311
7. **Amin, S.B.,** Chowdhury, M.I., Ehsan, S.M.A., and Iqbal, S.M.Z., 2021, "Solar Energy and Natural Disasters: Exploring Household Coping Mechanisms, Capacity, and Resilience in Bangladesh", Energy Research & Social Science, Volume 79, September 2021, 102190. https://doi.org/10.1016/j.erss.2021.102190
8. **Amin, S.B.,** Khan, A.M., Khan, F., and Ahmed, A., 2021, "Policy Paper on the Post Covid-19 Sustainable Energy Options for Power Generation in Bangladesh", International Energy Journal, Volume 21, Bangabandhu Chair Special Issue 1A, pp. 9-20. http://www.rericjournal.ait.ac.th/index.php/reric/article/download/2598/827
9. **Amin, S.B.,** Audry, N.N., & Ulfat, A.F., 2021. "The Nexus between Oil Price Shock and The Exchange Rate in Bangladesh." International Journal of Energy Economics and Policy, Volume 11, Number 2(2021), DOI: https://doi.org/10.32479/ijeep.10658
10. Alamgir, F., and **Amin, S.B**., 2021, "The Nexus between Oil Price and Stock Market: Evidence from South Asia", *Energy Reports*, Volume 7, pp. 693-703. https://doi.org/10.1016/j.egyr.2021.01.027
11. **Amin, S.B.,** Jamasb, T. & Nepal, R., 2020. "Regulatory Reform and The Relative Efficacy of Government Versus Private Investment on Energy Consumption in South Asia", Economic Analysis and Policy, 2020, DOI: https://doi.org/10.1016/j.eap.2020.12.019.
12. **Amin, S.B.,** Kabir, F.A. & Khan, F., 2020, "Energy-Output Nexus in Bangladesh: A Two-Sector Model Analysis", Energy Strategy Review. Volume 32, Number 2020. 100566. DOI: https://doi.org/10.1016/j.esr.2020.100566
13. **Amin, S.B.,** and Khan, F., 2020, "Modelling Energy Demand in Bangladesh: An Empirical Analysis", Journal of Developing Areas, Volume 54, Number 1, pp. 39-52.
14. **Amin, S.B.,** Khan, F., and Rahman, S., 2018, "Relationship between Renewable Energy Consumption and Economic Growth in Five South Asian Countries: An Empirical Analysis", World Review of Business Research, Volume 8, Number 3, pp. 46-61.
15. **Amin, S.B., and** Alam, T., 2018, "The Relationship between Energy Consumption and Sectoral Output in Bangladesh: An Empirical Analysis", Journal of Developing Areas, Volume 52, No. 3, Summer 2018, pp. 39-54.