Dillard College of Business Administration

Syllabus:
Intro to Econometrics - 20370 - ECON 3543 Section 201
Spring Session, 2025

Classes are on Tuesday and Thursday from 12:30pm to 1:50pm
in Dillard Building 306

CONTACT INFORMATION:

INSTRUCTOR:	Dr. John E. Martinez
OFFICE BLDG:	Dillard College, Second Floor, Rm 255
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OFFICE HOURS:	10:00 am to 11:15 am Mon. thru Thurs. or by appointment

COURSE MATERIALS:

Required Text:

Gujarati, Damodar; **Essentials of Econometrics**, Third edition
ISBN 978-0-07-297092-0, Publisher: McGraw-Hill Irwin, Publication date: 2006
4th edition of the text by the same author parallel closely with the 3rd edition.
See APPENDIX I and II for comparison of 4th with 3rd edition.

Optional Text:

Cody, Ron**: A Gentle Introduction to Statistics Using SAS® Studio in the Cloud,**
Copyright © 2021, SAS Institute Inc., Cary, NC, USA
978-1-954844-49-0 (Hardcover); 978-1-954844-45-2 (Paperback); 978-1-954844-46-9 (Web PDF); 978-1-954844-47-6 (EPUB); 978-1-954844-48-3 (Kindle)

Important! Be sure to bring Required text to each class.

Access to the following software is required for this class: SAS OnDemand for Academics and access to EXEL

SAS University Edition was a free version of SAS, but you had to download software to create a virtual computer on your real computer, then download the SAS software, and finally, set up a way to read and write files from your "real" computer to the "virtual computer". This caused many people massive headaches (including the author). The great news about SAS OnDemand for Academics (hence forth called **SODA – SAS OnDemand of Academics**) is that you don't have to download anything! You access SAS on a cloud platform. Also, reading data from your real computer is quite simple.

SODA uses SAS Studio as the interface. SAS Studio provides an environment that includes a point-and-click facility for performing many common tasks, such as producing reports, graphs, data summaries, and statistical tests.

Registering for SODA
To gain access to SODA, you need to register with SAS Institute. Part of the registration process is to create a SAS profile. If you already have a SAS profile, skip that portion of the instructions. To start, point your browser to: https://welcome.oda.sas.com. To sign up, just create your free SAS Profile and then sign in above to begin the registration process.

The text is designed to help students fully understand statistical analysis, its components, and its uses. Taking into consideration current statistical technology, its focuses on the use and interpretation of software, while also demonstrating the logic, reasoning, and calculations that lie behind any statistical analysis. Furthermore, the test emphasizes the application of regression tools to real-life business concerns. This multilayered, yet pragmatic approach fully equips students to derive the benefit and meaning of a statistical analysis.

Other Required Materials:
Students are required to have a video webcam. RESPONDUS will be used for monitoring purposes. Each student should have a thumb drive (USB) on which to keep various data sets and assignments that will be a part of each class. Projects and other selected assignments will include the requirement that electronic versions of your work be submitted. Maintaining these items on an accessible storage device will reduce stress that may otherwise develop with respect to submissions

COURSE DESCRIPTION:
The application of statistical methods to economic and financial analysis; particular attention is given to the regression analysis including limited and dichotomous dependent variables, regression diagnostics, hypothesis testing, analysis of variance, and selected topics in time series forecasting. Students can earn a SAS Badge upon successful completion of this class, along with another approved course. See the **Addendum I** below for **Information about SAS Certification.**

COURSE PREREQUISITE:
Junior standing or above or consent of the chair, and BUAD 3033 or equivalent.

OBJECTIVES:
LEARNING GOALS:
General Learning Goals:
Upon successful completion of this course, the student should:

- Demonstrate problem-solving and decision-making abilities through the critical analysis, evaluation, and interpretation of business information.
- Demonstrate a competency in speaking and writing for common business scenarios.
- Be able to utilize available technology for common business applications.

Course Specific Learning Goals:
Upon successful completion of this course, the student should:

- Be able to utilize SAS and EXCEL programs for solving business and economic problems. Demonstrate a competency, not only in using SAS and EXCEL programs, but also in interpreting output generated from those technologies.
- Understand basic ordinary least squares (OLS) regression and its application in economic research.
- Grasp the assumptions under which OLS regression analysis is developed and understand the reasons for these assumptions.

- Develop an understanding of the classical regression model and understand issues that arise when its fundamental assumptions are violated and to develop an appreciation for limitations that accompany OLS regression analysis and be able to identify instances in which application exceed common sense limitations.
- Demonstrate ability to read and interpret articles in which regression analysis is employed and identify specific items that validate (or invalidate) the model(s) and application(s).
- Understand extended applications of basic OLS regression analyses in selected, specialized econometric models.

Assessment:
Attainment of learning goals will be assessed by a combination of class discussions, problems and exercises in class, quizzes, and exams. Exercises and exams will assess student problem solving and decision making abilities as demonstrated by critical analysis, evaluation, and interpretation of business and economic information.

SYLLABUS CHANGE POLICY:
This syllabus is a guide for the course and is subject to change. All changes will be announced in class and students will be responsible for incorporating the changes into the syllabus. If, at some point, the university switches to an online format, then there will be significant changes in the manner in which exams are administered. Any exam taken online will be monitored through RESPONDUS, which will require students to have access to a webcam video.

COURSE POLICIES:
A. Attendance Policy:
Attendance is required for all in-class sessions for this course. You are expected to log into D2L a minimum of once weekly to check for updates and announcements via postings and email. See the university catalog for the University Class Attendance Policy.

B. Other Related Policies
Contact Procedures:
Sending messages either through my email is preferred [john.martinez@msutexas.edu]. If email is not possible, then through D2L. is the easiest asynchronous method of contacting me with a substantial issue. I respond to your emails within 48 hours (usually much faster). Text messages to my cell phone work well for emergency issues. Calling me by cell is for pressing matters only.

Course Time: Deadlines indicated in the syllabus/D2L are for Central Daylight Time. If you are completing coursework in another time zone, please note the time difference and plan accordingly.

Missed Examination Policy: Not applicable. You are responsible for managing your schedule to complete the quizzes by the posted time / date. If an emergency arises (e.g. serious injury, serious illness or death in your immediate family) contact me ASAP for different test arrangements.

GRADING and EVALUATIONS:
A student's grade will be based on one of the following:
Option I

Three Major Exams	75%	750 Points
Research Project	25%	250 Points

Option II

Three Major Exams	60%	600 Points
Research Project	20%	200 Points
Final Exam	20%	200 Points

GRADE EVALUATION:
As a percent of total points:
A (Above 90), B (80-89), C (70-79), D (60-69), F (below 60)

Option I Total Points:
[Exam Avg. X 7.5] + ~~[Final Exam Score X 4.0]~~ + [Res. Proj. X 2.5] + [Bon Pts.]

Option II Total Points:
[Exam Avg. X 6.0] + [Final Exam Score X 2.0] + [Res. Proj. X 2.0] + [Bon Pts.]

Major exams:
Three major exams will be given. Each exam is equally weighted and will involve calculation and derivation of answers as well as their interpretation and meaning. **Questions will come primarily from output generated from designated SAS programs and from textbook examples.** The SAS programs required to generate the SAS output are provided in a separate WORD file. Failure to take an exam on the scheduled date without prior approval will result either in an 'F' or 'I' (Incomplete) for the course. Online Exams have a specified time limit of two hours. Within a two-day window, students have the option as to the time, but are limited to one attempt only. Additional attempts constitute cheating and will be severely punished. The last major exam (III) is scheduled to be taken on the last day of class of the regular semester (prior to Final Exam week).

Final exam:
An **optional** final exam will be given with primary emphasis over the last section of the class. The Final will involve calculation and derivation of answers as well as their interpretation and meaning. **Questions will come primarily from output generated from designated SAS programs.**

Research Project:
See separate attachment about the requirements for your research project.

Missed Final Exam Policy:
No makeup exams are given. If a student has a legitimate reason for missing an Exam, the final exam score will replace the missing exam score. It is **your responsibility** to talk to instructor well in advance to ask to take the exam early. If I am not available in my office, you must leave a text message or e-mail **before the exam begins.** Provided there is a legitimate reason for missing the last exam, a student will receive a grad of 'I' for the course.

Class Participation:
Students are expected to participate in all class discussions.
Bonus Points:
Students may earn bonus points on a variety of assignments or on any number or other instructor approved activities.
Campus Carry:
Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For information regarding campus carry, please refer to the University's webpage at Campus Carry Polices Link.
Academic Integrity:
With regard to academic honesty, students are referred to the "Student Honor Creed" of **Midwestern State University Undergraduate Catalog**.
Americans with Disabilities Act:
This class follows the guidelines suggested by the Center for Counseling and Disabilities Services for those students who qualify for disability services. **See Midwestern State University Undergraduate Catalog.**
D2L:
The Midwestern State University D2L program will be incorporated into this class and will provide the primary default means of communication. Grades will be posted using D2L. **Each student is expected to master the use of the university website, D2L.** Assistance to achieve comfort using this program will be available as needed.
Syllabus Change Policy:
This syllabus is a guide for the course and is subject to change. All changes will be announced in class and students will be responsible for incorporating the changes into the syllabus. This syllabus is a guide for the course—not a "contract"—and is subject to change. Syllabus changes will be communicated via D2L.

OTHER RELEVANT INFORMATION:
Midwestern State University Student Handbook:
See the most recent MSU Student Handbook for a statement of the university's policy on academic dishonesty. Any other questions not specifically addressed by this syllabus are governed by the student handbook. Make sure you have a copy and are familiar with all the procedures therein. Pay close attention to the Code of Student Conduct section.

Medical or Other Serious Problems:
Please take time and make the effort to advise me if you have difficulties that require my attention to properly evaluate your classroom participation and activities.

Tape Recordings and Cell Phones:
Tape recording of lectures is permitted. You may not tape record any information or class discussion when a graded test is being reviewed. Cell phones and pagers are prohibited unless the instructor has granted permission to have them in class.

Return of Exams: For any in-class exam, failure to return exam will result in a 0 for that exam.

Grade Postings: Exam grades will be posted using D2L.
Plagiarism Statement:
"By enrolling in this course, the student expressly grants MSU a "limited right" in all intellectual property created by the student for the purpose of this course. The "limited right" shall include but shall not be limited to the right to reproduce the student's work product in order to verify originality and authenticity, and educational purposes."

Lower Grades:
The instructor reserves the right to lower any student's final grade by a letter grade for:
(A) A negative, rude, unreasonably argumentative or inattentive attitude in class, or,
(B) Repeatedly disrupting the class for any reason (tardiness), or,
(C) Not showing respect for fellow classmates' questions or opinions.

For Version 4, some datasets are found at this site:
https://highered.mheducation.com/sites/0073375845/student_view0/data_sets.html

Course Content and Outline:

Essentials of Econometrics, 3/e Damodar N. Gujarati
Chap 1 The Nature and Scope of Econometrics
[Problems to be solved with SAS] – 1.6 & 1.7
Part I BASICS OF PROBABILITY AND STATISTICS
Chap 2 Review of Statistics I: Probability and Probability Distributions
[Problems to be solved with SAS] – 2.14, 2.16-17
Chap 3 Characteristics of Probability Distributions
[Problems to be solved with SAS] – 3.9-10, 3.13, 3.15-16
Chap 4 Some Important Probability Distributions
[Problems to be solved with SAS] – 4.10-11, 4.13, 417, 4.19-20
Chap 5 Statistical Inference: Estimation and Hypothesis Testing
[Problems to be solved with SAS] – 5.7-10, 5.12, 5.15, & 5.20
Exam I: Scheduled to begin on Friday, Feb. 21 starting at 8:00am and to be completed by midnight on Saturday, Feb. 22. The Exam will be online via D2L - with a two-hour time limit – and monitored by RESPONDUS.

Part II THE LINEAR REGRESSION MODEL
Chapter 6 Basic Ideas of Linear Regression: The Two-Variable Model
[Problems to be solved with SAS] – 6.12, 6.13, 6.15, 6.16, 6.17, 6.18, 6.19 & 6.21
Chapter 7 The Two-Variable Model: Hypothesis Testing
[Problems to be solved with SAS] – 7.12-16, 7.18-23
Chapter 8 Multiple Regression: Estimation and Hypothesis Testing
[Problems to be solved with SAS] – 8.14, 8.16, 8.17, 8.18, & 8.19
Chapter 9 Functional Forms of Regression Models
[Problems to be solved with SAS] – 9.12, 9.13, 9.15, 9.16, 9.17, 9.18, 9.19 & 9.21
Chapter 10 Dummy Variable Regression Models
[Problems to be solved with SAS] – 10.11, 10.12, 10.19, 10.20 & 10.21

Exam II: Scheduled to begin on Friday, April 4 starting at 8:00am and to be completed by midnight on Saturday, April 05. The Exam will be online via D2L - with a two-hour time limit – and monitored by RESPONDUS.

Part III REGRESSION ANALYSIS IN PRACTICE
Chapter 11 Model Selection: Criteria and Tests
Chapter 12 Multicollinearity: What Happens if Explanatory Variables are Correlated?
Chapter 13 Heteroscedasticity: What Happens if the Error Variance is Nonconstant
Chapter 14 Autocorrelation: What Happens if Error Terms are Correlated?
Exam III: Is scheduled for the last class period of the regular semester on Thursday, May 8. The Exam is scheduled for in-class with a one-hour and 15 minute time limit.

Final exam- https://msutexas.edu/registrar/schedule/finalexamschedule.php
Thursday May 15 from 10:30am-12:30pm.

ADDENDUM I
Information about SAS Certification

Taking SAS certification exams help you validate your skills and increase your value to an employer. You can choose SAS certifications across many subjects, including programming, data management, and analytics, to name a few. For more information on SAS certification go here: https://www.sas.com/en_us/certification.html. All students, teachers, professors or staff associated with an academic institution qualify for **50% discount** on all SAS certification exams. Please contact certification@sas.com to receive the discount code that will reduce the exam fee by 50% during the registration process.

Resources for Learning SAS
SAS Certification Prep Guides: https://www.sas.com/store/books/categories/certification-guide/cBooks-cbooks_categories-cbooks_categories_12-p1.html
SAS Skill Set Learning Goals include: Data Visualization, SAS Programming, Statistical Analysis, and Descriptive Analytics. Visit SAS Communities Visit our online sites to share and connect with other SAS users and build your SAS skills. Don't miss key communities including: SAS Certification, SAS Training, SAS Academy for Data Science, SAS Programming, New SAS User, SAS Analytics U and SAS Viya for Learners.
https://communities.sas.com/t5/Learn-SAS/ct-p/learn

Spring Semester 2024* Priority Application Date for Admission

Martin Luther King's Birthday observed.....January 20
Classes begin.....January 21
Change of Schedule and Late Registration.....January 21-24
Final Deadline for May graduates to file for graduation .....February 17
Part of Term A Last Day for "W", 4:00 p.m. –
Drops after this date will receive grades of "F." >>>>>>>>>>>..... March05
Spring Break begins 5:00 p.m. .....March 8 (March 9-15)
Classes resume .....March 17
Holiday Break begins 10:00 p.m. .....April 16
Classes resume ..... April 21
Last day of classes..... May 9
Last Day for "W", 4:00 p.m. – Drops after this date will receive grades of "F." .....April 30

APPENDIX I	
Essentials of Econometrics - 4th edition compared to 3rd ed. Damodar N. Gujarati	
Essentials of Econometrics **4th ed**	Essentials of Econometrics **3rd ed**
Chap 1: The Nature and Scope of Econometrics **Introduction: Basics of Probability and Statistics** Appendix A: Review of Statistics: Probability and Probability Distributions Appendix B: Characteristics of Probability Distributions Appendix C: Some Important Probability Distributions Appendix D: Statistical Inference: Estimation and Hypothesis Testing EXAM-I	Chap 1 The Nature and Scope of Econometrics **Part I BASICS OF PROBABILITY AND STATISTICS** Chap 2 Review of Statistics I: Probability and Probability Distributions Chap 3 Characteristics of Probability Distributions Chap 4 Some Important Probability Distributions Chap 5 Statistical Inference: Estimation and Hypothesis Testing EXAM-I
Part I: The Linear Regression Model Chap 2: Basic Ideas of Linear Regression Chap 3: The Two-Variable Model: Hypothesis Testing Chap 4: Multiple Regression: Est. and Hyp. Testing Chap 5: Functional Forms of Regression Models Chap 6: Dummy Variable Regression Models EXAM-II	**Part II The Linear Regression Model** Chap 6 Basic Ideas of Linear Regression: Chap 7 The Two-Variable Model: Hypothesis Testing Chap 8 Multiple Regression: Est. and Hyp. Testing Chap 9 Functional Forms of Regression Models Chap 10 Dummy Variable Regression Models EXAM-II
Part II: Regression Analysis in Practice Chap 7: Model Selection: Criteria and Tests Chap 8: Multicollinearity: Correlated Explanatory Vars? Chap 9: Heteroscedasticity: Nonconstant Error Variance? Chap 10: Autocorrelation: Correlated Error Terms? EXAM III	**Part III Regression Analysis In Practice** Chap 11 Model Selection: Criteria and Tests Chap 12 Multicollinearity: Correlated Explanatory Var? Chap 13 Heteroscedasticity: Nonconstant Error Variance Chap 14 Autocorrelation: Correlated Error Terms? EXAM III
~~**Part III: Advanced Topics in Econometrics**~~ ~~Chap 11: Simultaneous Equation Models~~ ~~Chap 12: Selected Topics in Single-Equation Regression Models~~	~~**Part IV Advanced Topics In Econometrics***~~ ~~Chap 15 Simultaneous Equation Models~~ ~~Chap 16 Selected Topics in Single Equation Regression Models~~
~~**Appendices**~~ ~~APPENDIX E: STATISTICAL TABLES~~ ~~APPENDIX F: COMPUTER OUTPUT OF EVIEWS, MINITAB, EXCEL, AND STATA~~	~~**Appendices**~~ ~~**APPENDIX A: STATISTICAL TABLES**~~ ~~**APPENDIX B: COMPUTER OUTPUT OF EVIEWS, MINITAB, EXCEL, AND STATA**~~

Final examinations begin ..... May 12
Commencement ..... May 17

ECON 3543 – Econometrics

Name _____ **Date** _____

Student Econometric Research Project - General guidelines

1. By signing this assignment, you agree to work independently. However, if the instructor finds out that you have received help, you and the helper (if in this class) will receive zero credits.
2. You must submit your assignment through the Drop Box on D2L by the deadline. Late submissions will receive zero credit. A separate drop box folder has been set up for each part.
3. Please follow the instructions: click on assessments, then on assignments, then on Research Project, then on add file, then on my computer, then on upload, then choose your file, then on open, then on add, then on submit, and then on done. Then, your will receive a submission receipt email.
4. All three parts are due by midnight on **Tuesday, May 06**.
5. Severe penalties will be assessed for late submissions.
6. Submissions must be in Microsoft WORD form.
7. If I cannot open your file due to a different computer operating system, you will receive zero credits. If you have a computer that uses a Mac operating system, make sure your file can be open with a computer that uses Microsoft Windows. The student is responsible for submitting a file that can be managed with Microsoft operating system.
8. Provide a screenshot of your SAS OnDemand Profile Registration name or number for each part (I-III) of the research project [see below]: Do not provide your Profile in typed form. Failure to use appropriate screenshot procedures will result in you receiving zero credits.

The econometric research project consists of the following:

I. The research project consists of three parts: I - III

II. For each Part below, answer the following:

1. Using SAS regression procedures, insert the estimated coefficients for each model 1-4 in Table 1-3 below.
2. Interpret the results of the output generated for each model.

Summary of Functional Forms Involving Logarithms			
Model	Dep. Var.	Ind. Var.	*Beta1*
Level-level	Y	X	$\Delta Y=\beta 1 \Delta x$
Level-Log	Y	Log(x)	$\Delta Y=(\beta 1/100)\%\Delta x$
Log-Level	Log(Y)	X	$\%\Delta Y=(100\beta 1)\Delta x$
Log-Log	Log(Y)	Log(X)	$\%\Delta Y=\beta 1\%\Delta x$

3. For each model (1-4), determine if the CLRM assumptions are met.
   Specifically, answer the following questions:
   - Is their misspecification of the model?
   - Is heteroskedasticity of the error terms present?
   - Is multicollinearity present?
   - Is autocorrelation present?
   - Are the error terms normally distributed?
   - To what degree are there significant outliers or observations with extremely high leverage?
4. Evaluating the relative performance of each model? In answering this question, determine if the effect of the two squared variables are jointly significant.

III. Append your answers to the above questions for each part at the end of each 'b' table.

IV. At the end of each Part (1-III), create an Appendix (I-III) that consists of the SAS code used for all the regression models for each individual part.

Part I. (Level-Level Regression Models)
SAS OnDemand Profile Registration name or number: _____

Use data from wage.xlsx to estimate each regression model 1-4 in Tables 1 below.

Table 1a: Level-Level Regression Model				
	Model-1	Model-2	Model-3	Model-4
Dep Variable	wage	wage	wage	Wage
Independent Vars.				
	Constant	Constant	Constant	Constant
Educ	Educ	Educ	Educ	Educ
Exper		Exper	Exper	Exper
Tenure		Tenure	Tenure	Tenure
Expersq			Expersq	Expersq
Tenuresq			Tenuresq	Tenuresq
Female				Female
Female*educ				Female*educ

Table 1b: Level-Level Regression Models				
	Model-1	Model-2	Model-3	Model-4
Dep Variable	wage	wage	wage	Wage
Independent Vars.				
Constant				
Educ				
Exper				
Tenure				
Expersq				
Tenuresq				
Female				
Female*educ				

Part II. (Log-Level regression Models)
SAS OnDemand Profile Registration name or number: _____

Use data from wage.xlsx to estimate each regression model 1-4 in Tables 2 below.

Table 2a: Log-Level Regression Model				
	Model-1	Model-2	Model-3	Model-4
Dep Variable	lwage	lwage	lwage	Lwage
Independent Vars.				
	Constant	Constant	Constant	Constant
Educ	Educ	Educ	Educ	Educ
Exper		Exper	Exper	Exper
Tenure		Tenure	Tenure	Tenure
Expersq			Expersq	Expersq
Tenuresq			Tenuresq	Tenuresq
Female				Female
Female*educ				Female*educ

Table 2b: Log-Level Regression Models				
	Model-1	Model-2	Model-3	Model-4
Dep Variable	Log_wage	Log_wage	Log_wage	Log_wage
Independent Vars.				
Constant				
Educ				
Exper				
Tenure				
Expersq				
Tenuresq				
Female				
Female*educ				

Part III. (Log-Log regression Models)
SAS OnDemand Profile Registration name or number: _____

III. Use data from wage.xlsx to estimate each regression model 1-4 in Tables 3 below.

Table 3a: Log-Log Regression Model				
	Model-1	Model-2	Model-3	Model-4
Dep Variable	lwage	lwage	lwage	Lwage
Independent vars.				
	Constant	Constant	Constant	Constant
Educ	lEduc	lEduc	lEduc	lEduc
Exper		lExper	lExper	lExper
Tenure		lTenure	lTenure	lTenure
Expersq			lExpersq	lExpersq
Tenuresq			lTenuresq	lTenuresq
Female				Female
Female*educ				Female*educ

Table 3b: Log-Log Regression Model				
	Model-1	Model-2	Model-3	Model-4
Dep Variable	log_wage	log_wage	log_wage	log_wage
Independent vars.				
Constant				
Log_Educ				
Log_Exper				
Log_Tenure				
Log_Expersq				
Log_Tenuresq				
Female				
Female*educ				