

BUSI 6220 – Applied Regression Analysis Fall 2020

CLASS (DAY/TIME): W 3:30 – 6:20 pm , BLB 170
INSTRUCTOR : Dr. Arunachalam Narayanan (Chalam)
OFFICE: BLB 379J (but all office meetings will be through zoom, as the office is not setup for 6 ft .distance)
OFFICE HRS:

- Monday 6-7:30 pm
- Tuesday 6-7:30pm
- Wednesday 6:20 – 7:30pm, or by appointment

Zoom link: <https://unt.zoom.us/my/chalamunt>
E-MAIL (preferred): Arunachalam.Narayanan@unt.edu

Textbooks:

1. Kutner, Nachtsheim, & Neter, *Applied Linear Regression Models*, 4th Ed., McGraw-Hill, ISBN 978-0073014661 (***recommended text***)
2. Pardoe, *Applied Regression Modeling*, 2nd Ed., Wiley, ISBN 978-1118097281 (***OPTIONAL – good to have***)
3. Mendenhall and Sincich, *A second course in statistics and regression analysis*, Pearson Education, ISBN 9780321691699 (***OPTIONAL***)

Software

Preferred: Excel, MINITAB 17, IBM SPSS 24/25
Good to have: STATA, R 3.4, SAS 9.4 all available at CoB.

Learning Management System (Canvas)

The course is on Canvas. Please check frequently for updates.

Remote exams: May require respondus lock down browser. Make sure you have a system with web camera for interaction.

Course Description

BUSI 6220 Applied Regression Analysis. 3 hours. Applications of multivariate regression analysis, analysis of variance procedures, canonical correlation analysis and nonparametric statistical procedures to issues in business research involving multivariate data. Topics include building, evaluating, and validating a regression model; analyzing models using hierarchical regression, contrast coding, partial correlations and path analysis; logistic regression; and comparing parametric and corresponding nonparametric tests. Prerequisite(s): DSCI 5180 or equivalent and BUSI 6450 (may be taken concurrently with BUSI 6220).

Learning Goals

At the end of the course, you should:

1. Understand the problems and opportunities when dealing with Regression Analysis.
2. Understand the role of regression analysis in decision making:
3. Understand how Regression models can be used to analyze research data and test research hypotheses.
4. Understand how regression coefficients establish testable relationships between

variables.

5. Become familiar with some major statistical packages, such as Excel, MINITAB, IBM SPSS, STATA, SAS, and R, and be able to use them and perform regression analysis.

Class Attendance

Regular class attendance and informed participation are expected at a PhD level seminar. However there are COVID exceptions (see policies below later on in the syllabus). We will have assigned seating in the classroom and your attendance will be taken to enable contact tracing (if necessary). The room seats 80 students and we expect the class size to be between 15-20 students. The room layout is attached at the end of the syllabus. You will have plenty of space to spread out and sit. There are additional policies at the end of the syllabus.

Exams

Three exams are scheduled for the semester: two midterms and a comprehensive final exam. A basic test on statistical tools (“diagnostic test”) will be administered in the second week of class as per the BUSI 6220 course guidelines. Midterms will be administered on the days indicated in the course schedule. The final exam is comprehensive and will take place as scheduled officially by UNT. The exams will mostly consist of problem-oriented questions and will typically be closed books & notes. Some of it may require using computer (software) to solve. In addition, I may assign part of the exams as a “take-home” portion.

Quizzes

A number of short, in-class quizzes will be given. These will typically refer to the lecture material, homework problems, and case studies, presented in the current and in the previous class period.

Homework Assignments

Homework problems and exercises will be assigned throughout the semester. I expect everyone to complete the assignments on time. Assignment reports will be turned in electronically, by uploading them on Canvas. You may be asked to present your solution to the class. I strongly encourage you to work the solutions to these problems on your own. However, I also want you to feel free to exchange ideas with other students in the course (except during the exams!) Keep in mind that homework problems, appropriately modified, may re-appear as exam problems.

Case Studies and Published Papers

Case studies and papers will be discussed throughout the semester. Each one of them is trying to make an important point, which you need to understand very well, and remember throughout the semester (and, hopefully, the rest of your career as a researcher or an academic!) In the research papers, which are sampled from business journals, the focus will be on the methods/research design, and results/statistical analysis sections. You are not asked to turn in any reports on case studies or published paper readings, and there will be no grade component directly assigned to the case studies or the published papers. However, keep in mind that the main points discussed in the case studies and the papers may appear on quizzes and exams.

Project

The course has a term project.

Option 1:

The project should involve data you collected personally, including survey data, company data, personal data, or archival data from any source (public and private) – proper acknowledgement must be given for the source. You are encouraged to work in groups (of 2 members). You may expand on work you started in your Research Methods class (BUSI 6450) or other equivalent class, as long as you perform some original data analysis. Project status updates will take place throughout the semester. Results of your analysis will be presented to class in a brief (10 min or less) presentation, during the last week of classes.

Option 2:

If you are not able to collect data or retrieve archival data for your project, reach out to me, I may assign you a project related to COVID data. It is based on a concept called “Levitt Metric”, several groups can work on it, and each can pick up a City or State and predict the progress of the pandemic (work involved – collecting data, performing the pre-regression steps and finally using regression to predict the progress).

For both options:

Deliverables include

- (1) your **data set** in Excel format,
- (2) your **presentation slides** in PowerPoint format, and (3) your **methods write-up** in Word format.

Statistical Software

You are expected to be able to use relevant software required for solving problems assigned as homework and for take-home portions of the exams. I will provide examples, or even step-by-step instructions from time to time, but there will still be a lot of self-learning involved. We will use IBM SPSS and MINITAB extensively in this course. We will introduce STATA and R to a smaller extent. However, you are free to use any of these statistical packages for your analysis of exam/homework questions.

Grading

Your total grade in the course is on a **600**-point grading scale. Each midterm exam is worth 100 points; the final exam is worth 150 points. Each one of 10 graded HW assignments is worth 10 points, for a total of 100 points. The term project is worth 100 points. Each one of 5 quizzes is worth 10 points, for a total of 50 points.

Exam 1	100	
Exam 2	100	
Final Exam	150	
HW assignments	100	(10 home works)
Project	100	
Quiz	50	(5 quizzes)
Additional Bonus opportunities		(Will be discussed in class- Max 25 points)

Course grades will be assigned as follows:

> 90 % = A; 80 to 89 % = B; 70 to 79 % = C; 60 to 69% = D; < 60 % = F

Academic Integrity

This course adheres to the UNT policy on academic integrity. The policy can be found at <http://policy.unt.edu/sites/default/files/06.003.pdf>. If you engage in academic dishonesty related to this class, you will receive a failing grade on the test or assignment, and a failing grade in the course. In addition, the case will be referred to the Dean of Students (for graduate courses, also the Dean of Toulouse Graduate School) for appropriate disciplinary action.

The term “cheating” includes, but is not limited to,

(1) use of any unauthorized assistance in taking quizzes, tests, or examinations; (2) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (3) the usage, without permission, of tests or other academic material belonging to a faculty member or staff of the university; or

(4) dual submission of a paper or a project without express permission from the instructor. The term “plagiarism” includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full or clear acknowledgment, or proper citation and reference. It also includes the unacknowledged use of materials prepared by another person or agency in the selling of term papers or other academic materials. (Source: Code of Conduct and Discipline at the University of North Texas; please check online for the most updated version and related definitions.)

Students with Disabilities

UNT complies with the Americans with Disabilities Act in making reasonable accommodations. Please see your instructor as soon as possible to discuss.

Deadlines

Dates of drop deadlines, final exams, etc., are published in the university catalog and the schedule of classes. Please be sure to stay informed about these dates.

Student Perceptions of Teaching (SPOT)

Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This short Web-based survey will be available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in this feedback from my students, as I work to continually improve my teaching. I consider SPOT to be an important part of your class participation.

Campus Closures

Should UNT close campus, it is your responsibility to keep checking your official UNT e-mail account to learn if your instructor plans to modify class activities, and how.

COVID-19 impact on attendance

While attendance is expected as outlined in the syllabus, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or

unable to attend class due to COVID-19 including symptoms, potential exposure, pending or positive test results, or if you have been given specific instructions to isolate or quarantine from a health care provider or a local authority. It is important that you communicate with me prior to being absent so I may make a decision about accommodating your request to be excused from class.

If you are experiencing any symptoms of COVID-19 please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Hotline at 844-366-5892 or COVID@unt.edu for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.

Remote Instruction:

The UNT fall schedule requires this course to have fully remote instruction beginning November 28th. Additional remote instruction may be necessary if community health conditions change or you need to self-isolate or quarantine due to COVID-19. Students will need access to a [webcam and microphone – faculty member to include what basic equipment is needed] to participate in fully remote portions of the class. Additional required classroom materials for remote learning include: laptop with ability to access statistical software house in College of Business servers and ability to view/interact with zoom and Canvas website. Learn more about how to be successful in a remote learning environment

Class recordings

Sessions in this course will be recorded for students enrolled in this class section to refer to throughout the semester. Remember, the recordings will be the basic slides and my voice during the in-class presentation, the class is not equipped to capture audience interactions. Class recordings are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.

Face coverings

1. Face coverings are required in all UNT facilities. This course has been approved for an exception to the face covering requirement to facilitate student learning. Portions of the class to be delivered without face coverings. Times when face coverings can be removed will be indicated during each class period. If you are unable to wear a face covering or do not feel you can safely attend class without your face covering due to a disability, please contact the Office of Disability Access to request an accommodation. UNT face covering requirements are subject to change due to community health guidelines. Any changes will be communicated by your instructor.
2. Face coverings are required in all UNT facilities. Students are expected to wear face coverings during this class. If you are unable to wear a face covering due to a disability, please contact the Office of Disability Access to request an accommodation. UNT face covering requirements are subject to change due to community health guidelines. Any changes will be communicated via the instructor.

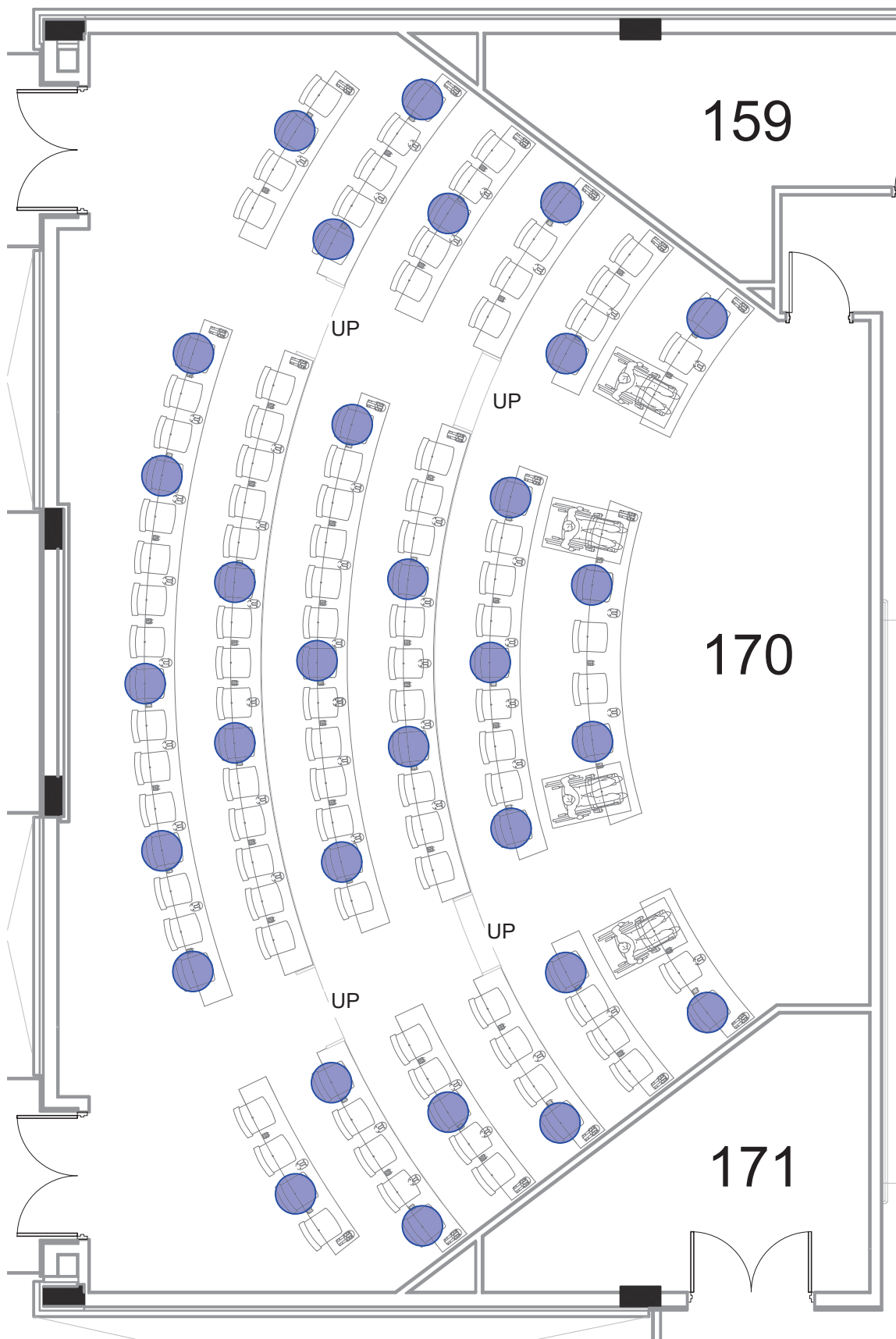
BUSI 6220 TENTATIVE TIME SCHEDULE – Fall 2020

The schedule below is a tentative outline for the semester. It is meant to be a guide and several items are subject to change. Certain topics may be stressed more or less than indicated.

TEXTBOOK LEGEND: P=Pardoe, KNN (recommended text)= Kutner, Nachtsheim, Neter.

Week (Wednesday)	Topics Covered	Readings and Exercises
1 (Aug 26)	Syllabus Lecture 1: Introduction to Simple Linear Regression, estimation of parameters <ul style="list-style-type: none"> • Analytical solution to LS estimation • Use of Excel, SPSS, MINITAB, and STATA 	P 2.1-2.3, KNN 1 HW0 (Diagnostic Test prep), HW1 Case 1: When test scores seem too good
2(Sep 2)	Diagnostic Test (1 hour duration) Remaining discussions from Week 1	
3 (Sep 9)	Lecture 2: Inference in Regression Analysis, Model assumptions, analysis of residuals <ul style="list-style-type: none"> • Measures of Strength of Association • ANOVA approach to Simple Regression • Model assumptions 	P 2.3, KNN 1, KNN 2 HW2 Case 2: The Market Model and investment portfolio selection
4 (Sep 16)	Lecture 3: Diagnostics and remedial measures, Box-Cox transformation and Yeo-Johnson Transformations	P 2.4, KNN 2, KNN 3 HW3, Q1
5 (Sep 23)	Lecture 4 : Simultaneous inference, Confidence Intervals, Prediction Intervals	P 2.6, KNN 3, KNN 4 HW 4, Q2 Project Update: Topic, group members
6 (Sep 30)	September 30, Exam 1	
7 (Oct 7)	Lecture 5: Matrix approach to Simple Linear Regression and Multiple Regression Analysis <ul style="list-style-type: none"> • Matrix approach • Interpretation of coefficients • Model assumptions & residual analysis • Partial regression 	KNN 5 , KNN6 HW5 Project Update: Research Questions, Survey Items

8 (Oct 14)	<p>Lecture 6: Multiple Regression contd.</p> <ul style="list-style-type: none"> • Multicollinearity • Remedial measures for Multicollinearity <p>Nominal and Qualitative Scales</p> <ul style="list-style-type: none"> • Dummy Coding 	<p>P 3.1-3.4, KNN 6, KNN 7 HW6 Case 3: The red car paradox</p>
9 (Oct 21)	<p>Lecture 7: Interactions, construct reliability How to develop scales</p>	<p>P 4.1-4.3, KNN 8, Q3 HW 7 Case 4: Survey analysis/part 1 Case 5: Can regression make a case for causality?</p>
10 (Oct 28)	<p>Lecture 8: Building the Regression Model</p> <ul style="list-style-type: none"> • Model Selection • Model Validation • Diagnostics 	<p>P 5.3, KNN 9 HW 8, Q4, Paper1</p>
11 (Nov 4)	<p>November 4, Exam 2 (Monday, Nov 2: Last day to drop the course and avoid an F)</p>	
12 (Nov 11)	<p>Lecture 9: Regression Model Diagnostics, and Autocorrelation in Time Series Data</p> <ul style="list-style-type: none"> • Outliers • Influential observations • Autoregressive techniques • ACF and PACF plots 	<p>P 5.1, KNN 10, 11, 12 HW 9 Project Update: data collection status</p>
13 (Nov 18)	<p>Lecture 11: Additional topics of interest</p> <ul style="list-style-type: none"> • Mediation effects • Logistics Regression 	<p>KNN 14 HW 10, Q5 Project Update: status Case 6: survey analysis/part 2</p>
14 (Nov 25) <u>(Thanksgiving Wednesday)</u> – <u>Possible no class</u>	<p>Lecture 12: Endogeneity Papers assigned for reading in Week 13 (May move it to earlier depending on the progress of the class)</p>	<p>Three papers on endogeneity and empirical research, challenges and solutions</p>
15 (Dec 2) – Remote class	<p>Term project presentations Review for the final exam</p>	<p>Final Exam take-home portion assigned Term Project presentation</p>
16 (Dec 9)	<p>FINAL EXAM</p> <ul style="list-style-type: none"> • Take-home portion due on Wednesday, Dec 9, 9:00 AM • In-class comprehensive final exam (remote using respond us lockdown browser) <p>Wednesday, Dec 9, (remote – 2 hour exam, the exam will be open for 1 to 7pm for convenience)</p>	



COVID 6'-0" SOCIAL DISTANCING PLAN - FALL 2020

BLB
RM 170

SD CAP:

31

