TEXAS A&M UNIVERSITY COMMERCE
COLLEGE OF SCIENCE, AGRICULTURE AND ENGINEERING
DEPARTMENT OF MATHEMATICS

CLASS SYLLABUS

Instructor:	Dr. Joshua Patterson	Semester:	Fall, 2022
Office Phone:	903-468-8660	Office Hours:	MWF @ 12-1pm or by appointment
Office:	Binnion 303A		& TR @ 1-2pm [ONLINE]
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I. Course: MATH 561.01W, Regression Analysis, 3 credit hours

II. Course Description: Any conclusions or inferences made from a model are only as valid as the model itself. Thus, the appropriate model should be used for each application. To that end, this course will discuss both the tools and techniques for selecting a valid model. In addition, we will study the mathematical properties of linear and some limited non-linear models and how they should be interpreted.

Prerequisites: MATH 401 or MATH 502 or MATH 402 and MATH 403, each with a grade $\geq$ 'C'.

III. Text (required): A Modern Approach to Regression with R by Sheather, Simon J. (2009). Springer Texts in Statistics. ISBN: 978-0-387-090607-0, e-ISBN: 978-0-387-09608-7

IV. Technology: Access to a CAS (computer algebra system) is required, such as Mathematica, Matlab, or R. While I am not going to require a specific CAS, it is worth noting that R is both designed for statistical applications, open-source and free. Use the following steps to install both R, and it's companion RStudio:

(a) Go to https://cran.r-project.org/ to download and install R for your choice of operating system.

(b) Go to https://www.rstudio.com/products/rstudio/download/ to download and install RStudio for your choice of operating system.
NOTE: R must be installed before installing RStudio.
For documentation on how to use R, see https://cran.r-project.org/doc/contrib/Faraway-PRA.pdf

V. Student Learning Outcomes:

- Identify appropriate graphs, summary statistics, models, and inferential statistics for various contexts.
- Interpret graphs, statistics, and models in various contexts.
- Calculate summary and inferential statistics.
- Compare and contrast various models.
- Create appropriate models for various contexts.

VI. Methods of Evaluation:

Evaluation methods may include grading homework, chapter or major **oral** exams, quizzes, and computer assignments.

Participation: Since this class is online, we will be using **Discord** to facilitate collaboration. Discord has many advantages over Zoom; namely it allows everyone to collaborate with everyone else, it supports LaTeX for math symbols, WolframAlpha for in-text computation, voice, video, and text. It has an app for all major phone operating systems, and can be installed on PC and Mac; best of all, it's **free for everyone.**

Discord Invite Link: https://discord.gg/5tNPFvFP2X

Homework: Homework assignments will be uploaded and assigned through D2L. They will be due approximately every three (3) to four (4) weeks. Selected questions will be graded. Each homework assignment will be worth 100 points. Late work will be subject to a reduction of 5 points per day. At least half of all homework assignments need to be to be completed or the course grade will be an automatic F.

Final Exam: The Final Exam will be comprehensive and is worth of 150 points. It will be facilitated by a take-home written exam which is uploaded to D2L. Students will then work the problems assigned and schedule a time with me to conduct the oral exam on Discord. The purpose of the take-home written exam is to motivate the oral discussion. Your Final Exam grade is determined entirely by the oral portion–written work will not be graded. A copy of the rubric I use for evaluating the oral portion will be included at the end of this syllabus.

Extra Credit: On occasion, we may have an extra credit opportunity extended to the class. These extra credit opportunities will be limited to a maximum of 5 points per opportunity and no more than 15 points for the entire class.

Grades: If one does not complete at least half of all homework assignments, the course grade will be an F. The maximum possible points available in this course are:

3 Homeworks	300 points
Final Exam	150 points
Total	450 points

Your course grade will be based on the percentage of the points you make to the total points available in the course:

$$A \geq 90\%, \qquad B \geq 80\%, \qquad C \geq 70\%, \qquad D \geq 60\%, \qquad F < 60\%$$

VII. Other Information:

- The information for students with disability: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: Office of Student Disability Resources and Services, Texas A&M University-Commerce, Gee Library, Room 162, Phone (903) 886- 5150 or (903) 886-5835, Fax (903) 468-8148, email: StudentDisabilityServices@tamuc.edu
- Basic Tenets of Common Decency: "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (Student's Guide Handbook, Policies and Procedures, Conduct.) This means that rude and/or disruptive behavior will not be tolerated.
- Free tutoring service is provided by the Math Skill Center (Binnion Hall Room 328) with the following hours: M and W, 8am–8pm; T and R, 8am–6pm; and F 8am–12pm

CLASS SCHEDULE, Fall 2022
MATH 561.01W
ONLINE

Week of	Monday
8/29	Syllabus & Introduction / Motivational Material
9/5	Simple Linear Regression
9/12	Simple Linear Regression in R
9/19	Diagnostics and Transformations for Simple Linear Regression & HW
9/26	Weighted Least Squares
10/3	Multiple Linear Regression
10/10	Multiple Linear Regression in R
10/17	Diagnostics and Transformations for Multiple Linear Regression & HW
10/31	Variable Selection
11/7	Logistic Regression
11/14	Logistic Regression in R
11/21	Thanksgiving & HW
11/28	Serially Correlated Errors
12/5	Review
12/12	FINAL ORAL EXAM: **Schedule your time early!**

*This schedule is for reference. The actual coverage of each week may be different. Please join the Discord server to stay up to date with any changes that may take place.

EXTRA CREDIT OPPORTUNITY

Those who use the discord invite link on pg. 2 to join the discord server before 9/5/2022 will earn 5 points extra credit to be applied to the first homework grade.

WELCOME TO THIS CLASS
HAVE A SUCCESSFUL SEMESTER

MATH 561.01W Final Exam Grade Report

Instructor Name	Student Name	Student ID	Discord Username
Joshua Patterson, PhD			

Grading Rubric for Oral Final Exam

Trait	Description	Score	Weight	Grade
Resolution	Answers and results are accurate.	0 1 2 3 4 5	×6	
Knowledge	Displays a deep and systematic wealth of knowledge of the material.	0 1 2 3 4 5	×6	
Sythesis	Student demonstrates that they have internalized and consolidated the major concepts and ideas.	0 1 2 3 4 5	×6	
Communication	Information is clearly and effectively delivered.	0 1 2 3 4 5	×2	
				Total: /100

Score	Description	Explanation of Score
5	Strong	Shows control and skill in this trait; many strengths present.
4	Competent	Strengths outweigh the weaknesses; a small amount of revision is needed.
3	Developing	Strengths and need for revision are about equal.
2	Emerging	Need for revision out weighs strengths.
1	Initiation	A initial beginning of their journey in Math.
0	Absent	Student did not take the Exam.

Comments

The End