



Dillard College of Business Administration

ECON 6333: Data Analytics – Statistical Learning

Online Class

Fall 2023

Contact Information

Instructor: Dr. Andrew Holt

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Office: Dillard Building 217

Office Hours: Tuesday: 11:00-12:30

Wednesday: 10:00-12:00

Thursday: 11:00-12:30

The subject line of any email you send to me must be **“StatLearn: First Name, Last Name”**. If the subject line is wrong, then I will ignore your email or maybe I will ask you to resend your email with the correct subject line.

Course Materials

- Introduction to Statistical Learning Python Edition, 1st Edition
- A working webcam along with Lockdown Browser and Respondus Monitor
- Python 3: Download Python 3 onto your computer.
- Anaconda: Go to <https://www.anaconda.com> and install the free version of anaconda. We will use Spyder to code in Python.

Course Description

This is a graduate course intended to introduce you to the field of statistical learning. Student's will learn about a variety of statistical learning techniques and how to implement them using Python.

Objectives:

General Learning Goals: Students will be asked to demonstrate their critical thinking and problem-solving skills by applying statistical learning techniques in their homework assignments and exams. This course aims to contribute to developing students' ability to communicate their analyses in a professional manner. Student's will have to integrate the statistical knowledge they acquire from this course with multiple business disciplines.

Course Specific Learning Goals: Students will learn topics including Linear Regression, KNN Regression, Classification, Resampling, Ridge and Lasso Regressions, Dimension Reduction techniques, Spline Regressions, and Tree-Based methods. While we will mostly focus on intuition this class will also be useful as an introduction to Python coding.

Assessments:

1. Homework Assignments: There will be 8 homework assignments. The types of questions on the homework will be similar to the types of questions on the exams.

2. Exams: There will be two exams: a mid-term that will cover chapters 1-5 and a final which will cover chapters 6-9. Students will be required to take exams online with a webcam turned on.

Missed Exam Policy:

If you miss one of the midterm exams, then 90% of your grade on the final will replace the missing grade. So, if you miss the first exam and make a 100% on the final, then you only get 27 points for the midterm that you missed.

Grading:

Assignment	Points
Homework Assignment #1	10
Homework Assignment #2	10
Homework Assignment #3	10
Homework Assignment #4	10
Homework Assignment #5	10
Homework Assignment #6	10
Homework Assignment #7	10
Homework Assignment #8	10
Midterm Exam	30
Final Exam	30

A= 89.5-100% C =69.5-79.5%
B= 79.5-89.5% D= 59.5-69.5% F= <59.5%

Cheating:

We will be using Respondus Monitor and LockDown Browser for the exams. I will monitor the recordings. Student's will not be allowed to use notes on the exam. If a student's eyes move away from the monitor I will judge this as a student cheating. The first time that I catch you cheating on an exam, I will give you a 0 for that exam. The second time I will give you a 0 in my course.

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 by not be limited to the right to reproduce the student's work product in order to verify the originality and authenticity.”

Tape Recordings:

Students are not allowed to record lectures.

Americans with Disabilities Act

This course follows the university policies and guidelines suggested by the Disability Support Services Office for qualified students. Students are referred to the Midwestern State University Undergraduate Catalog for details.

Campus Carry Policy

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 more information regarding campus carry, please refer to the University's webpage at [link to MSU campus carry rules and policies](#).

Syllabus Change Policy

This syllabus is a guide for this course and is subject to change with advanced notice.

References

Midwestern State University Student Handbook

Midwestern State University Undergraduate Catalog

Course Content

Week	Dates	Topics	Chapters	Homework	Exams
1	Aug 27 th – Sept. 2 nd	Intro to Statistical Learning	2		
2	Sept. 3 rd – Sept. 9 th	Linear Regression	3.1 – 3.4		
3	Sept. 10 th – Sept. 16 th	KNN Regression	3.5 – 3.6	HW 1 Due Sept. 11 th	
4	Sept. 17 th – Sept. 23 rd	Logistic Regression & Discriminant Analysis	4.1 – 4.4	HW 2 Due Sept. 18 th	
5	Sept. 24 th – Sept. 30 th	Generalized Linear Models	4.5 – 4.7		
6	Oct. 1 st – Oct. 7 th	Resampling	5	HW 3 Due Oct. 2 nd	
7	Oct. 8 th – Oct. 14 th		Exam Week	HW 4 Due Oct. 9 th	Exam 1 Due Oct. 13 th
8	Oct. 15 th – Oct. 21 st	Shrinkage & Principal Component Regression	6.1 – 6.3		
9	Oct. 22 nd – Oct. 28 th	Practical Problems with High Dimensions	6.4 – 6.5		
10	Oct. 29 th – Nov. 4 th	Polynomial Regression & Regression Splines	7.1 – 7.5	HW 5 Due Oct. 30 th	
11	Nov. 5 th – Nov. 11 th	Local Regression & General Additive Models	7.6 – 7.8		
12	Nov. 12 th – Nov. 18 th	Decision Trees & Boosting	8	HW 6 Due Nov. 13 th	
13	Nov. 19 th – Nov. 25 th		Thanksgiving	HW 7 Due Nov. 20 th	
14	Nov. 26 th – Dec. 2 nd	Vector Support Machines	9.1 – 9.3		
15	Dec. 3 rd – Dec. 9 th	SVMs with More than Two Classes	9.4 – 9.6		
16	Dec. 10 th – Dec. 16 th		Exam Week	HW 8 Due Dec. 11 th	Exam 1 Due Dec. 14 th