Biometry for the Coastal Sciences (COA 606)

Date: 21 August 2024

Instructor: Dr. Robert Leaf

Office: GCRL Oceanography 119

Office Hours: I have an open door policy and welcome your questions and concerns. Stop in to see me anytime or make an appointment and lets meet to discuss your needs. Unfortunately, sometimes I have deadlines and travel and will not be able to accommodate "drop in" students every time but will make every reasonable effort to accomodate your schedule.

Email: robert.leaf@usm.edu

Course Meeting Day and Time: MW, 4:00 to 5:15 PM

Course Description and Objectives

This course addresses basic approaches to experimental design, statistical analysis, and presentation of quantitative information.

At the conclusion of this course:

By the end of this course, you will be able to:

- Define what comprises the field of statistical analysis.
- What is meant by random samples, random sampling, and understanding how these aspects of sampling are critical for description and inference.
- Explain the differences and similarities among variables, statistics, and parameters.
- Define a cumulative density function and a probability density function and describe several common distributional families (e.g., normal, binomial, chi-square).
- Understand and be familiar with the applications of:
- Frequency distributions
- Power analysis
- Summary statistics as a tool for describing data
- Means comparison techniques for testing hypotheses
- ANOVA comparison techniques for testing hypothesis
- Linear regression techniques for describing relationships between random variables.
- Make appropriate decisions as a part of a statistical data analysis.

Course Materials - Online and in the Caylor Library

Statistics for Engineers and Scientists 4th Edition by William Navidi

Readings https://tinyurl.com/r5r6sy58

Homework https://tinyurl.com/ycxeshw3

Course Workload Statement

The expectation of the University of Southern Mississippi is that students should spend approximately 2 to 3 hours outside of class each week for every hour in class working on reading, assignments, studying, and other work for the course. Time management is thus critical for student success. All students should assess

their personal circumstances and talk with their advisors about the appropriate number of credit hours to take each term. Resources for academic support can be found at https://www.usm.edu/success.

Course Scheduling

Class Number	Date	Section	Activity	Additional Resources
1	Wednesday, August 21, 2024	Sampling and Descriptive Statistics 01	Navidi Ch. 1	Amitav and Chaudhury 2010, Broman and Woo 2018
2	Monday, August 26, 2024	Sampling and Descriptive Statistics 02		
3	Wednesday, August 28, 2024	Sampling and Descriptive Statistics 03	HW01 Due, In Class Assignment	
4	Monday, September 2, 2024	Labor Day Holiday		
5	Wednesday, September 4, 2024	Probability 01	Navidi Ch. 2	
6	Monday, September 9, 2024	Probability 02	In Class Assignment	
7	Wednesday, September 11, 2024	Exam 01	HW02 Due	
8	Monday, September 16, 2024	Commonly Used Distributions 01	Navidi Ch. 3	Manikandan 2011
9	Wednesday, September 18, 2024	Commonly Used Distributions 02		
10	Monday, September 23, 2024	Commonly Used Distributions 03	In Class Assignment	
11	Wednesday, September 25, 2024	Confidence Intervals 01	HW03 Due, Navidi Ch. 5	
12	Monday, September 30, 2024	Confidence Intervals 02	In Class Assignment	
13	Wednesday, October 2, 2024	Exam 02	HW04 Due	
14	Monday, October 7, 2024	Hypothesis Testing 01	Navidi Ch. 6	Hurlburt 1984, Pernet 2016
15	Wednesday, October 9, 2024	Hypothesis Testing 02		
16	Monday, October 14, 2024	Hypothesis Testing 03		

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Class Number	Date	Section	Activity	Additional Resources
17	Wednesday, October 16, 2024	Correlation and Simple Linear Regression 01	HW05 Due, Navidi Ch. 7	Aggarwal and Ranganathan 2016
18	Monday, October 21, 2024	Correlation and Simple Linear Regression 02	In Class Assignment	
19	Wednesday, October 23, 2024	Exam 03	HW06 Due	
20	Monday, October 28, 2024	Multiple Regression 01	Navidi Ch. 8	
21	Wednesday, October 30, 2024	Multiple Regression 02	In Class Assignment	
22	Monday, November 4, 2024	Factorial Experiments 01	HW07 Due, Navidi Ch. 9	Andrew and Underwood 1993
23	Wednesday, November 6, 2024	Factorial Experiments 02		
24	Monday, November 11, 2024	Factorial Experiments 03	In Class Assignment	
25	Wednesday, November 13, 2024	Exam 04	HW08 Due	
26	Monday, November 18, 2024	Factorial Experiments 04		
27	Wednesday, November 20, 2024	Computer Intensive Sampling Approaches 01		Hesterberg 2015
28	Monday, November 25, 2024	Computer Intensive Sampling Approaches 02	In Class Assignment	
29	Wednesday, November 27, 2024	Thanksgiving Holiday		
30	Monday, December 2, 2024	Multimodel Inference 01		Burnham and Anderson 2011
31	Wednesday, December 4, 2024	Multimodel Inference 01	In Class Assignment	
32	Monday, December 9, 2024	Final Exam	HW09 Due	

Course Evaluation

Percentage	Letter Grade
93-100	A
90-92	A-
86-89	B+
83-85	B
80-82	B-
76-79	C+
73-75	C
70-72	C-
66-69	D+
63-65	D
60-62	D-
< 60	F

Grading scale

Evaluation type	Number	Points per item	Total points
HW	9	20	180
Exam 01	1	20	20
Exam 02	1	20	20
Exam 03	1	20	20
Exam 04	1	20	20
Final Exam	1	20	20

Academic Support Resources

If a student knows or believes that they have a disability which is covered by the Americans with Disabilities Act (ADA) and makes them eligible to receive classroom accommodations, they should contact the Office for Disability Accommodations (ODA) for information regarding the registration process. Disabilities covered by the ADA may include but are not limited to ADHD, learning disabilities, psychiatric disabilities, physical disabilities, chronic health disorders, temporary illnesses or injuries and pregnancies. Students should contact ODA if they are not certain whether their documented medical condition qualifies for ODA services. Students are only required to disclose their disability to the Office for Disability Accommodations. All information submitted to ODA by the student is held with strict confidentiality.

Mental Well-Being Statement

I recognize that students sometimes experience challenges that make learning difficult. If you find that life stressors such as anxiety, depression, relationship problems, difficulty concentrating, alcohol or drug problems, or other stressful experiences are interfering with your academic or personal success, consider contacting Student Counseling Services on campus at 601-266-4829. More information is also available at https://www.usm.edu/student-counseling- services. All students are eligible for free, confidential individual or group counseling services. In the event of emergency, please call 911 or contact the counselor on call at 601-606-HELP (4357).

Nondiscrimination Statement

The University of Southern Mississippi offers to all persons equal access to educational, programmatic and employment opportunities without regard to age, sex, sexual orientation, disability, pregnancy, gender identity, genetic information, religion, race, color, national origin, and/or veteran status pursuant to applicable state and federal law.

Confidentiality and Mandatory Reporting

As an instructor, one of my responsibilities is to help create and maintain a safe learning environment. I have a mandatory reporting responsibility related to my role as a faculty member. I am required to share information regarding sexual misconduct or information about a crime that may have occurred on the USM campus with certain University officials responsible for the investigation and remediation of sexual misconduct. The information will remain private and will only be shared with those officials necessary to resolve the matter. If you would like to speak in confidence, resources available to students include Confidential Advisors with the Shafer Center for Crisis Intervention, the Counseling Center, and Student Health Services. More information on these resources and University Policies is available at https://www.usm.edu/sexual-misconduct.

Academic Integrity

All students at the University of Southern Mississippi are expected to demonstrate the highest levels of academic integrity. Forms of academic dishonesty include cheating (including copying from others work), plagiarism (representing another persons words or ideas as your own; failure to properly cite the source of your information, argument, or concepts), falsification of documents, disclosure of or use of test material or other assignment content to another student, submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members involved, unauthorized academic collaboration with others, conspiracy to engage in academic misconduct. What is Barry Bonds' lifetime slugging percentage?

Engaging in any of these behaviors or supporting others who do so will result in academic penalties and/or other sanctions. If a faculty member determines that a student has violated our Academic Integrity Policy, sanctions ranging from resubmission of work to course failure may occur, including the possibility of receiving a grade of XF for the course, which will be on the student transcript with the notation "Failure due to academic misconduct."