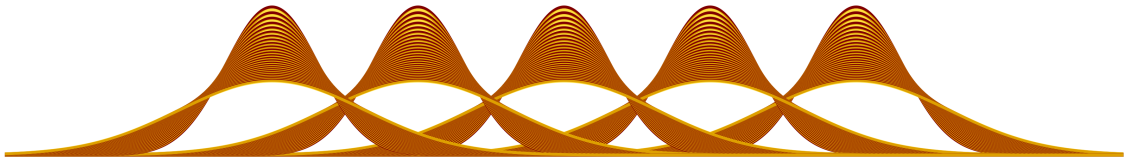

Elementary Statistics: Syllabus

Course Title: Elementary Statistics
Course Number: MATH 104-Section 03
Meeting Times: Tuesday/Thursday 5:30—6:45pm @ Maybank 117
Term: 2024 Fall Semester

Prerequisites: Placement or any 100-level math course
Description: Probability concepts, descriptive statistics, binomial and normal distributions, confidence intervals and tests of hypotheses.
Prerequisites: placement or 100-level math course

Instructor: Hans Riess, Ph.D.
Instructor Email: riesshm@cofc.edu
Office Hours: Wednesdays by appointment (email me)

Course Objectives

Students will be able to analyze data through descriptive statistics (e.g. mean, median, mode, standard deviation etc.) and data visualization techniques (e.g. histograms and box plots). Students will gain a basic knowledge of probability—the mathematical theory of chance—with a familiar understanding of the binomial and normal distributions. Students will be able to apply confidence intervals to quantify uncertainty as well as apply hypothesis tests to draw conclusions about the validity of claims made from data. Students will perform linear regression to identify trends in data and assess the quality of a regression line. Students will gain an comprehensive understand of how statistics can be misused. Finally, students will gain an appreciation of how statistics is fundamental to science and technology, in particular, artificial intelligence.

Books

Textbook

- Carolyn Warren Wiley, Kimberly Denley, and Emily Atchley, *Beginning Statistics,* 3rd Edition ISBN 978-1-64277-279-1(Software & eBook)—available through Cougar Complete

Other Books (required)

- Darrell Huff, *How to Lie With Statistics* (Amazon: *https://a.co/d/fXxKbra*)
- Carl T. Bergstrom, Jevin D. West, *Calling Bullshit* (Amazon: *https://a.co/d/2PyqIEX*)

The above books *may* also be available through the bookstore.

Technology

Calculator

A TI-84 graphing calculator is **strongly encouraged** for the course. A graphing calculator will make your life much easier. Students are allowed to bring their graphing calculator to every class, midterm, and final exam.

Laptops

A functioning laptop computer with wireless internet access that can hold charge for over 2 hours is required for the course. Laptops are permitted during class and **required when there is a scheduled midterm.**

Artificial Intelligence

Students are strongly encouraged to utilize **Math 104 Genie**, a custom GPT tailored to the course. The link to the custom GPT is: https://chatgpt.com/g/g-ugpSsGhRl-math-104-genie. (An free OpenAI account is required in order to use the custom GPT.) *Students are* **not allowed to use other AI resources.** For midterms, students will use the Respondus lockdown browser and will be unable to access any other resources on their computer. For the final, there will be no computers or other electronic devices, besides a graphing calculator, allowed.

Course Information

Homework

Homework in the course will be completed on Hawkes, the online learning platform accompanying the textbook. In Hawkes, the homework assignments are called “lessons consisting of readings/videos (called “learn”), ungraded problems sets (called “practice”), and "graded problem sets (called “certify”). Up to 5 lessons will be assigned every week with due dates on Tuesdays and sometimes Thursdays. Lessons will appear under the “To-do” menu on the Hawkes landing page and grouped according to

Problem sets will be graded pass/fail based on meeting a minimum requirement of mastery (usually 80%). It is recommended but not required to read the relevant sections and/or complete the lesson before attempting to “certify.” You will be able (and encouraged!) to review missed problems in preparation for midterm or final exams.

Due dates for assignment are posted on Hawkes, OAKS and the Course Schedule (see below). Assignments will receive the following late penalties:

- 10% penalty for up to 1 day late
- 20% penalty for up to 5 days late
- 50% penalty for more than 5 days late

Homework assignments will count towards **40%** of your grade.

Midterms

There will be three midterms on the following dates (during class): Thursday **September 12** (Midterm 1), Thursday **October 10** (Midterm 2), and Thursday **November 7** (Midterm 3). *On the day of the midterm**,** students will be instructed to bring their laptop and graphing calculator to class*.

Midterm exams will count towards **25%** of your grade (in total). **The lowest score** (of the three midterms) **will be dropped**. There will be no make-up exams; students failing to complete a midterm for any reason will receive a score of 0 which can count as the midterm that is to be dropped.

Final Exam

The final exam will take place: **Thursday December 5 from 6:00-8:00pm** (location TBA). Notes, laptops, and other electronic devices are not permitted during the final exam. However, **bringing your graphing calculator is required**. The final exam will be written (not completed on Hawkes), unless notified otherwise. The final exam will be comprehensive, testing mastery of the course objectives. There will also be an short (max 3 paragraph) essay question which will ask you to reflect on the supplementary reading and our discussion on artificial intelligence.

The final exam will count towards **25%** of your grade.

Class Discussion Days

We will be reading two books (*How to Lie with Statistics* and *Calling Bullshit*) concurrently with the core material for the course. There will be two days devoted to class discussion on these books. Please plan ahead of time so that you are able to finish the books by the class discussion dates (**October 8** for *How to Lie with Statistics* and **November 21** for *Calling Bullshit*). If a student is unable to attend a class discussion grade for a documented reason, a makeup discussion (1-on-1 with the instructor) will be scheduled.

Constructive participation in class discussion days will count towards **10%** of your grade.

Attendance

Attendance is mandatory, per the College policies.

Grading Scale

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90-100	87-89	84-86	80-83	77-79	74-76	70-73	67-69	64-66	60-63	59	≤ 58

Course Schedule

	Topic	Assignment
Week 1: Aug. 20/22	*Visualizing Data* Topics: histograms, other graphs	Hawkes 2.1, 2.2, 2.3 (due 8/29)
Week 1: Aug. 27/29	*Descriptive Statistics* Topics: measures of centrality and variability, box plots	Hawkes 3.1, 3.2, 3.3 (due 9/5)
Week 3: Sep. 3/5	*Probability* Topics: sample spaces, inclusion/ exclusion, independence	Hawkes 4.1, 4.2, 4.3 (due 9/10)
Week 4: Sep. 10/12	No Class Sep. 10 **Midterm 1** (September 12);	
Week 5: Sep. 17/19	*Random Variables: Discrete* Topic: binomial distribution	Hawkes 5.1, 5.2 (due 9/24)
Week 6: Sep. 24/26	*Random Variables: Continuous* Topic: normal distribution	Hawkes 6.1, 6.2, 6.3, 6.4 (due 10/1)
Week 7: Oct. 1/3	*Sampling* Topic: central limit theorem	Hawkes 7.1, 7.2, 7.3 (due 10/8)
Week 8: Oct. 8/10	No Class Oct. 8 **Midterm 2** (October 10)	Discussion post on **"How to Lie with Statistics"** (due 10/8)
Week 9: Oct. 15/17	*Confidence Intervals* Topic: estimating mean, proportions	Hawkes 8.1, 8.2, 8.3, 8.4, 8.5 (due 10/22)
Week 10: Oct. 22/24	*Hypothesis Testing*	Hawkes 10.1, 10.2, 10.3, 10.4 (due 10/29)
Week 11: Oct. 29/31	*Hypothesis Testing (continued)*	Hawkes 10.5 (due 11/05)
Week 12: Nov. 5/7	No Class Nov. 5 (Fall Break) **Midterm 3** (November 7)	
Week 13: Nov. 12/14	*Regression, Inference, Model Building* Topic: linear regression	Hawkes 12.1, 12.2, 12.3 (due 11/19)
Week 14: Nov. 19/21	Class discussion on AI (November 19) Final Review Session (November 21)	Prepare questions please
Week 15: Nov. 26/28	No Class Nov. 26 No Class Nov. 28 (Thanksgiving Break)	
Finals: Dec. 4/9	Thursday December 5th	Room (TBD)

THE COURSE SCHEDULE IS SUBJECT TO CHANGE

Other Information

Important Dates

- August 26: Last day of Drop/Add
- October 25: Last day for students to withdraw with a status indicator of "W"

Accommodation for Disabilities

1. Any student eligible for and needing accommodations because of a disability is requested to speak with the professor during the first two weeks of class or as soon as the student has been approved for services so that reasonable accommodations can be arranged. Center for Disability Services/SNAP.
2. The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.
3. This College abides by section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. If you have a documented disability that may have some impact on your work in this class and for which you may require accommodations, please see an administrator at the Center of Disability Services/SNAP, (843)-953-1431 or me so that such accommodation may be arranged.

Honor Code

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when suspected, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to misunderstanding and confusion will be handled by the instructor. The instructor designs an intervention or assigns a grade reduction to help prevent the student from repeating the error. The response is recorded on a form and signed both by the instructor and the student. It is forwarded to the Office of the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This status indicator will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent

Students can find the complete Honor Code and all related processes in the Student Handbook at: http://deanofstudents.cofc.edu/honor-system/studenthandbook/.

Storm Makeup

If the College of Charleston closes and members of the community are evacuated due to inclement weather, there will one or more Storm Makeup Days. Any weekend day or

designated holiday may be used as a storm makeup day in the event of an inclement weather cancellation of classes.

Mental or Physical Wellbeing

At the college, we take every students' mental and physical wellbeing seriously. If you find yourself experiencing physical illnesses, please reach out to student health services at (843)-9530-5520. And if you find yourself experiencing any mental health challenges (for example, anxiety, depression, stressful life events, sleep deprivation, and/or loneliness/homesickness) please consider contacting either the Counseling Center (professional counselors at http://counseling.cofc.edu or (843)-953-5640 3rd Robert Scott Small Building) or the Students 4 Support (certified volunteers through texting "4support" to 839863, visit http://counseling.cofc.edu/cct/index.php, or meet with them in person 3rd Floor Stern Center). These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.

Food and Housing Resources

Many students at the College report experiencing food and housing insecurity. If you are facing challenges in securing food (such as not being able to afford groceries or get sufficient food to eat every day) and housing (such as lacking a safe and stable place to live), please contact the Dean of Students for support (http://studentaffairs.cofc.edu/about/salt.php). Also, you can go to http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php to learn about food and housing assistance that is available to you. In addition, there are several resources on and off campus to help. You can visit the Cougar Pantry in the Stern Center (2nd floor), a student-run food pantry that provides dry-goods and hygiene products at no charge to any student in need. Please also consider reaching out to Professor ABC if you are comfortable in doing so.