Statistics for the Behavioral and Social Sciences

BIOL/PSYC/SOCI 224

MWF 1:25 - 2:20, St. Clair Hall 301

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Course Description: The students participating in this class should expect to learn the statistical practices familiar to contemporary research in the behavioral, social, and natural sciences. Students will learn both the mechanics and logic of these practices with special emphasis on their application in their chosen field of study.

Prerequisite(s): Math 150.

Course Objectives: At the completion of this course, students will be able to compute and interpret descriptive/inferential statistics as well as choose the appropriate models and post-hoc tests (goodness of fit, interpreting VIF, etc.). Students should be prepared to describe, design, and carry out simple linear regression modeling for their own research (with an eye to their senior capstones or theses).

Text(s):

- *Statistics for the Behavioral and Social Sciences: A Brief Course*, 6th edition. (2019) **Author(s):** Arthur Aron, Elliot J. Coups, & Elaine N. Aron; **ISBN-13** 978-0205989065
- Additional readings will be made available on the course's D2L site as required.

Grade Distribution:

Participation	100
Homework	200
Data & R Assgn.	150
Exam 1	125
Exam 2	175
Exam 3	250
Total	1000

Letter Grade Distribution:

>= 900	A
800 - 899	B
700 - 799	C
600 - 699	D
<= 599	F

Course Policies:

- **Attendance**
  - Attendance is mandatory, as in you must come to class. Make-up tests and quizzes will only be allowed in the event of a **documented** medical or family emergency, or College sanctioned event. In the case of the latter, student athletes, or members of any other College organization, it is in your and my best interest that I be informed of any of these events as soon as possible so that we may schedule a make-up.
  - **No makeup quizzes or exams will be given without the proper documentation.**
- **Academic Honesty**
  - **Don't cheat**. The honor code is in effect throughout the semester. By taking this course, you affirm that it is a violation of the code to cheat on exams, to plagiarize, to deviate from the teacher's instructions about collaboration on work that is submitted for grades, to give false information to a faculty member, and to undertake any other form of academic misconduct. You agree that the teacher is entitled to move you to another seat during examinations, without explanation. You also affirm that if you witness others violating the code you have a duty to report them to the honor council.
  - Do familiarize yourself with the practices and policies in the Columbia College Student Handbook.
- **Classroom Conduct**
  - The students in this class will be respectful of others. I welcome diverse opinions and invite you all to do the same. I invite you to review the Columbia College Standards of Conduct and to familiarize yourself with those expectations I and the College have, not only for your conduct, but also for that which you should expect in the classroom. If you have questions or concerns about your learning environment you are encouraged to contact the professor or the Office of Student Conduct:
    - studentconduct@ccis.edu; (573) 875-7877
  - I invite you to review the College's Notice of Non-Discrimination and Equal Opportunity:
    - Notice of Non-Discrimination and Equal Opportunity: http://www.ccis.edu/policies/notice-of-non-discrimination-and-equal-opportunity.aspx
  - If for any reason you are made to feel uncomfortable, have been the victim of, or feel you may at risk of, sexual misconduct, harassment and/or discriminatory behavior, you are encouraged to contact the professor or the Title IX officer directly.
    - Title IX Office: titleixcoordinator@ccis.edu

- **Disability Services**
  - Columbia College is committed under the Americans with Disabilities Act and its Amendments and Section 504 of the Rehabilitation Act to providing appropriate accommodations to individuals with documented disabilities. If you have a disability-related need for reasonable academic adjustments in this course, provide the instructor(s) with an accommodation notification letter from Student Accessibility Resources office. Students are expected to give two weeks- notice of the need for accommodations. If you need immediate accommodations or physical access, please arrange to meet with instructor(s) as soon as your accommodations have been finalized.
  - If you have any questions about your eligibility for accommodations please contact the Student Accessibility Resources office:
    * sar@ccis.edu
    * (573)875-7626

Assignments:

- **Participation**
  - Students are expected to participate in class. This means join in during discussions, ask questions, and practice engaged learning.
  - Students will be regularly asked to complete work in a group or demonstrate their work in front of the class. Part of mastering statistics is being able to communicate in the language of statistics. To be counted as participating students should come to class ready to discuss both solutions to the homework assigned, but also questions they may have.
- **Data & R Assignments**
  - At approximately the quarter-post of the semester we will begin to create and employ datasets in our class work and R labs.
  - Students will be evaluated on their maintenance of said data, as well as their understanding of what these sets contain.
  - Students will further be evaluated on their ability to port the data into R and complete given assignments. This not only includes being able to create the output asked for, but being able to interpret said output, *and* to know when certain functions are required.
- **Exams**
  - Students will have three exams.
  - These tests will be a mix of computation and short answer.

Tentative Course Outline:
The weekly coverage might change as the the progress of the class demands. However, you must keep up with the reading assignments. All weeks, save for those with exams, are structured approximately the same: We begin the week with a lecture on the stated topic and by mid-week apply what we have discussed in group or individual in-class and/or homework. We will part at week's end with my assigning individual homework, which, barring holidays will be due the following Monday.

- **Week 1: January 6, 8, & 10**
  - **Description:** Class Introduction; Frequency tables (matrices) & a discussion of data.
  - Readings: AEA Chapter 1
    - Homework: Flavor and temperature matrix **due Monday 1/13**
- **Week 2: January 13, 15, & 17**
  - **Description:** Variance: The reason we do what we do; Calculating a population mean, standard dev., and z-scores.
  - AEA Chapter 2
    - Homework: "Simple" calculations worksheet **due Wednesday 1/22.**
- **Week 3: January 22 & 24**
  - **NO CLASS:** January 20 - MLK Day
  - **Description:** Understanding correlation (statistics) and what it means to our research theoretically (causality).
  - AEA Chapter 3
    - Homework: "Intermediate" calculations worksheet **due Monday 1/27.**
- **Week 4: January 27, 29, % 31**
  - **Description:** Beginning to discuss regressions (predictions) and their use in research (the culmination of weeks 2 & 3).
  - AEA Chapter 3 Cont'd.
    - Exam 1: In class, **January 31.**
- **Week 5: February 3, 5, & 7**
  - **Description:** Lab Week #1
  - We will meet in **LAB** to introduce students to R.
    - Data input and summary statistics exercise will be **due Friday 2/7.**
- **Week 6: February 10, 12, & 14**
  - **Description:** Inferential statistics - or - What comes after the regression?
  - AEA Chapter 4
    - Homework: Interpretation Worksheet #1 **due Monday 2/17.**

- **Week 7: February 17, 19, & 21**
  - **Description:** Hypothesis Testing, Part 1.
  - AEA Chapter 5
    - Homework: Interpretation Worksheet #2 **due Monday 2/24.**
- **Week 8: February 14, 26, & 28**
  - **Description:** Hypothesis Testing, Part 2.
  - AEA Chapter 6
    - Homework: Calculations worksheet **due Monday 3/2.**
- **Week 9: March 2, 4, & 6**
  - **Description:** The Cult of Significance: Statistical & Substantive Significance
  - AEA Chapter 7
  - Exam 2: In class, **March 6.**
- **Week 10: March 9, 11, & 13**
  - **Description:** Lab Week #2.
  - Students will have the week to complete Lab Exercises #2, due **Monday 3/16.**
- **Week 11: March 16, 18, & 20**
  - **Description:** t-Tests, Part 1
  - AEA Chapter 8
    - Homework: **due Friday 3/20.**
- **Week 12: March 23, 25, & 27**
  - **NO CLASS: Spring Break**
- **Week 13: March 30, April 1 & 3**
  - **Description:** t- Tests, Part 2
  - AEA Chapter 9
    - Homework: **due Monday 4/6.**
- **Week 14: April 6, 8, & 10**
  - **Description:** ANOVA
  - AEA Chapter 10
  - Homework:**due Monday 4/13.**
- **Week 15: April 13, 15, & 17**
  - **Description:** Non-normal distributions

  - AEA Chapter 11
  - Homework: Final R assignment released 4/17 and **due Monday 4/20.**

- **Week 16: April 20, 22, & 24**
  - **Description:** What to expect in graduate school. And prepare for FINAL
  - AEA Chapter 12

- **FINAL EXAM:** April 28, 8a - 10a
  - Regular classroom.