

ELEMENTARY STATISTICS

SYLLABUS

STAT 02100-01 Wednesdays and Fridays, 9:30 am – 10:45 am / James Hall 3114

Instructor: Anthony J. Marchetta, marchetta@rowan.edu; office hours: Wed & Fri 10:45 pm – 12:00 pm,

by appointment only

Prerequisites: Foundation of Mathematical Reasoning or Basic Algebra II or Equivalent

Textbook: Custom version of *Mann* (8th ed.) as the default text: *Introductory Statistics*, 8th edition. By Prem S. Mann (“2013”). John Wiley & Sons. ISBN 978-1-118-79245-2. (The custom version will purposely have some sections omitted).

Required Calculator: TI-83/84 (Plus or Silver), TI-89/NSpire.

Course Description: This course gives a basic introduction to the fundamental concepts and methods of statistics. Its topics include: basic measures of central tendency and variability, graphical displays, descriptive simple linear regression, elementary probability, the normal and t-distributions, confidence intervals and hypothesis testing.

Course Objectives:

- * Students will learn the basic concepts of types of data, data production, sample vs. population, and statistic vs. parameter.
- * Students will gain an understanding of concepts of, and how to construct, basic graphical techniques for presenting data.
- * Students will gain an understanding of concepts of as well as the calculation of basic descriptive statistics.
- * Students will be able to construct the regression line for numerical bivariate data, and they will understand what that regression line describes (but not do inference).
- * Students will be able to take data and, when appropriate, construct one-sample confidence intervals for means and proportions, and know what they mean.
- * Students will be able to take data and, when appropriate, perform one-sample hypothesis tests for means and proportions, and know what the results mean.

Course Activities: The classroom activities will include formal & informal lectures where statistical concepts & statistical problems will be explained. Students will have the opportunity to contribute to the discussion and to ask questions about the material. Homework will be reviewed as necessary during class time.

Homework and Preparedness: At the end of each lecture, students will receive a homework assignment. Students must complete these assignments before the next class meeting, and It is also recommended that students read and outline the chapters that will be discussed in the lecture for the next meeting beforehand. Although homework is not graded, its completion is imperative as exam questions are modeled directly from homework questions. Every class lecture begins with a brief homework review and material from the previous lecture is used to clarify homework.

Course Outline

Day	Date	Class No.	Topics / Exams	Text Sections
W	1/23	1	Review of the Syllabus Branches of Statistics, Population vs Sample, Basic Terms	Sec 1.1-1.3
F	1/25	2	Types of Variables Summation Notation, Sources of Data, and Sampling Techniques	Sec 1.4 Sec 1.7 & A1/A2
W	1/30	3	Frequency Distributions, Relative Frequency, Pie Charts, Frequency Histogram, and Cumulative Frequency	Sec 2.1-2.3
F	2/1	4	Stem Leaf & Other Numerical Graphical Displays: i.e. Dot plots	Sec 2.4/2.5
W	2/6	5	Measures of Center: Mean, Median and Mode Intro to Measures of Dispersion (Ungrouped Data)	Sec 3.1 / 3.2
F	2/8	6	Measures of Variability: Range, variance and standard deviation Shapes of Distribution / Empirical Rule	Sec 3.2-3.4
W	2/13	7	Measures of Location: five number summary, Quartiles, IQR, & Concept of Percentile; Outliers	Sec 3.5
F	2/15	8	Intro. to Probability: Basic Probability, Conditional Probability; Complement Rule	Sec 4.1-4.3
W	2/20	9	Probability: Multiplication rule w/ Contingency Tables; Addition Rule	Sec 4.4-4.5
F	2/22	10	Random Variables & Discrete Probability Distributions	Sec 5.1/5.2
W	2/27	11	Exam 1	
F	3/1	12	Discrete Random Variables: Mean and Standard Deviation (and Variance)	Sec 5.3
W	3/6	13	Continuous RVs & Intro to Normal Distribution	Sec 6.1/6.2
F	3/8	14	Normal Distribution (finding probabilities)	Sec 6.1/6.2

W	3/13	15	Applications of Normal Distribution & Finding values	Sec 6.3/6.4
F	3/15	16	Sampling Distributions	Sec 7.1-7.2
			SPRING BREAK	
W	3/27	17	Mean & Standard Deviation of x-bar	Sec 7.2
F	3/29	18	Central Limit Theorem & Applications of the Sampling Distribution of x-bar	Sec 7.3-7.4
W	4/3	19	Exam 2	
F	4/5	20	Introduction to Point estimation & Confidence Interval for mean	Sec 8.1
W	4/10	21	Confidence Interval for mean (1 sample & σ unknown) with assumptions check; (normality or $n \geq 30$)	Sec 8.3
F	4/12	22	Point Estimation & Confidence Interval for proportion (1 sample) w/ required assumptions check	Sec 8.4
W	4/17	23	Introduction to Hypothesis Testing	Sec 9.1
F	4/19	24	Hypothesis Testing for mean: 1 sample when σ unknown including assumptions check	Sec 9.3
W	4/24	25	Hypothesis Testing: 1 sample proportion including assumptions check	Sec 9.4
F	4/26	26	Scatterplots & Correlation	13.1
W	5/1	27	Simple Linear Regression	13.4
F	5/3	28	Normal Quantile Plots	Appendix 6.1
W	5/8	29	Review for Final	
F	5/10		Comprehensive Final Exam - per schedule on Section Tally	

Note: Adjustments of the outline may be made by instructor and if so, will be discussed in class:

Rowan Core (General Education)

Starting in Fall 2018, first-year undergraduate students at Rowan University must complete the new general education requirements, known as Rowan Core. (Continuing students and new transfer students will follow the existing general education requirements.) Students in Rowan Core must complete course requirements in six literacies: Artistic, Communicative, Global, Humanistic, Quantitative and Scientific. This course belongs to the Quantitative Literacy. All students in this course will be assessed on the following Rowan Core Learning Outcomes for this literacy:

- * 3. Students can describe the differences between continuous (e.g. measurable) and discrete (e.g. countable) quantities and how this affects how they can be analyzed.
- * 1. Students can define basic statistical and regression vocabulary and also qualitatively describe the meanings relative to a set of given data (e.g. mean vs. median, what does the standard deviation represent; correlation coefficients, and model parameters
- * 4. Students can perform basic statistical and regression analyses on data and also qualitatively describe the meaning of the results (e.g. how they change as new data are added, limits of regression models and how they can infer correlation and/or causality)
- * 6. Students can perform basic analyses on both discrete and continuous data.

For details on the new Rowan Core and existing general education requirements, please consult your advisor or the 2018-19 Undergraduate Catalog (<https://sites.rowan.edu/catalogs/>).

There are **many majors** that require Statistics I or Biometry, or who give students the choice between Elementary Statistics and Statistics I, so you should be aware of the following information:

- a) All College of Business and Psychology students should be in Statistics I, not Elementary Statistics
- b) All Biology students should be in Biometry, not Elementary Statistics
- c) Students considering the possibility of taking Statistics II or are in the Statistics/Operations Research concentration should be in Statistics I

Class attendance policy: To receive credit for this course, students must attend no less than 80% of the class meeting times (in other words, students may not exceed 5 absences). Attendance is taken at random times during the class meeting period. If missed attendance, it is your responsibility to communicate with the instructor to be marked present. *Half-absences:* students who are more than 20 minutes late, or who leave before the rest of the class is dismissed, will receive a half-absence.

E-mail policy: Students may receive an email if campus is closed or if class is cancelled. Otherwise, please only email the instructor for emergencies like extended absences, and for office hours requests. All communications should during class time otherwise.

Testing: Bring a TI approved calculator, at least two pencils, and an eraser. Cell phones are not permitted during testing. The instructor may allow a handwritten formula sheet for quizzes and exams when appropriate. For the quizzes, some will be take-home while others will be sit-in during class. The take-home will not be announced in advance, but the sit-in will be announced in advance.

Evaluation:

Grade Component	Percentage (%)
Exam 1	20
Exam 2	20
Final Exam	25
Activities	25
Class Attendance & Participation	10
Total	100

The final exam will be administered per Rowan Final Exam schedule found on Section Tally.

Grading:

93 - 100	A
90 - 92	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
77 - 79	C+
73 - 76	C
70 - 72	C-
67 - 69	D+
63 - 66	D
60 - 62	D-
59 and below	F

Tutoring: Visit the Tutoring Center (x4460, Savitz Hall) or the statistics tutors who are available in the Mathematics Learning Center. **Use Starfish to find out when statistics tutors are available.**

Disabilities: Students with disabilities are encouraged to speak with me as early in the semester as possible about your needs for special accommodations. If you have not already done so, you should also speak with the office of Disability Resources in the Academic Success Center, Savitz Hall 302 (x4234).

See also <http://www.rowan.edu/studentaffairs/asc/disabilityresources>.

If you are failing the course and do not wish to have an F appear on your transcript, the best option is to withdraw before the withdrawal deadlines and take the class again at a later date. Check the Rowan website for the dates of the withdraw deadlines and get insight on what formal paperwork/signatures are required.

Academic integrity: The integrity of academic programs is imperative to Rowan University's mission. Students are therefore expected to uphold the highest standards of academic integrity and not engage in nor tolerate academic dishonesty. Academic dishonesty includes, but is not limited to, fabrication, cheating or plagiarism. Any violation of academic integrity will be investigated and, where warranted, the student will receive **appropriate sanctions** through the University's Student Conduct Process. Please familiarize yourself with the current Rowan University Student Handbook. In particular, adherence to the Student Conduct Policy and Academic Integrity Policy will help to ensure that your learning and living experiences are founded on integrity.

Note: Using any electronic device other than your calculator for quizzes and exams is also considered "cheating" because of using unauthorized material.

Cell Phones and Laptops and Electronics: All electronics/ laptops /tablets/cell phones must be turned off during class time. Cell phones must be set to silent mode during instruction and should be avoided as much as possible while students are in class. Only students with special needs documentation may use electronic devices as seen fit by a child study team.