Math 163, Basic Statistics, Spring 2020

Statistics is the field of study involving (1) the collection, summarization, and analysis of data; and (2) the drawing of inferences about a population from the examination of a sample of the population. The goals of this course are to introduce each student to the practice of statistics and to provide an overview of common topics in statistical inference.

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Official course website:
https://d2l.arizona.edu/d2l/home/871755
Course Location: Bio Sci West, Room 237
Office Hours: Tuesday 5pm – 6pm
                Wednesday 3:30pm – 4:30pm
                Thursday 5pm – 6pm

Tutoring: http://math.arizona.edu/~tutoring   **Think Tank:** Wednesday 2pm – 3pm (MTL 121)
Official course communication: duronc@math.arizona.edu

Objectives and Expected Learning Outcomes for Math 163:
Students will gain an appreciation of statistics. Learning outcomes include the following:
- Organize and interpret data, create data summaries.
- Perform simple linear regression analysis.
- Understand importance of a valid design of experiments and surveys, and random sampling techniques.
- Understand properties of a normal distribution and a binomial distribution.
- Calculate basic probabilities.
- Identify proper inference procedures for one and two sample tests on the mean, one and two sample test of proportion, and chi-squared test. Interpret p-values.
- Use Excel and a Calculator as statistical analysis tools.

Course Structure and Attendance
Math 163 is a 3-credit hour course. Students will meet in person three days per week except when there are no class meetings due to University holidays. Daily attendance is expected from every student. Students who miss the first class meeting may be administratively dropped unless they have made other arrangements. Absences for any sincerely held religious belief, observance, or practice will be accommodated where reasonable: policy.arizona.edu/human-resources/religious-accommodation-policy.
Absences pre-approved by the UA Dean of Students (or dean's designee) will be honored.

Math 163 Description: Organizing data: displaying distributions, measures of center, measures of spread, scatterplots, correlation, regression, and their interpretation. Design of experiments: simple random samples and their sampling distribution, models from probability, normal distributions, and normal approximations. Statistical inference: confidence intervals and hypothesis testing, t procedures and chi-square tests. Not intended for those who plan further studies in statistics. Except as per University policy on repeating a course, credit will not be given for this course if the student has credit in a higher-level math course. Such students may be dropped from the course. Examinations are proctored.

Required Materials:
Launchpad for *The Basic Practice of Statistics*, 7th Edition, by David S. Moore, Notz, Fligner is required. The Launchpad includes an e-book. See D2L for more information.
Launchpad is an online portal that includes the textbook as an e-book, problems, quizzes, and several student resources including tutoring, video clips, a discussion component, and case studies. Students will be required to read sections of the textbook and use additional resources as needed. Homework and quizzes will be done through the LaunchPad, as well as in class. Students are expected to follow the calendar and due dates in LaunchPad along with additional assignments posted on the course website or announced in class.

Graphing Calculator: Each student is required to have, and to know how to use, a graphing calculator that can do the statistical calculations, correlation, and linear regression. You are expected to bring this to class. In-class quizzes and exams will require calculators. No calculator swapping will be permitted during exams or quizzes. A TI-83 or TI-84 is recommended. I am not able to provide support for the use of other calculators. Calculator guides for TIs are in LaunchPad. You cannot use your phone or a device that can access the internet as a Calculator.

Homework

Aside from a few exceptions, each chapter covered will have one online quiz and one online homework associated with it. These assignments will be due at midnight on their due date. It is up to the student to keep track of due dates in Launchpad. In addition to online assignments, there will be an in-class quiz or take-home quiz every week, except for test weeks. Lastly, there will be 3 Excel assignments spread out over the semester.

To account for issues that may arise during the semester, one or two low scores in each category (except for Excel) will be dropped at the end of the semester.

Examinations: Three midterm examinations will be given during the weeks indicated in the Course Schedule. Tentative exam dates are on February 20th, March 26th, and April 30th. The final examination will be given in our regular classroom.

Please note the following:

- University rules relating to final examinations may be found at:
  https://www.registrar.arizona.edu/courses/final-examination-regulations-and-information
- The University final exam schedule may be found at:
  https://www.registrar.arizona.edu/students/courses/final-exams

Unless there are extenuating circumstances, a missed midterm examination or a missed final examination will result in a score of zero for that work. The instructor must be notified within 48 hours of the exam for a make-up to be considered, and the student must have a verifiable excuse. Any make-up exam is at the discretion of the instructor. University policy will be followed regarding final exams. An early final will not be given unless there is a University of Arizona excused absence or conflict.

Course Grades:

In class exams (3)	300 pts
In class quizzes/written homeworks	70 pts
Online homework	80 pts
Online quizzes	20 pts
Excel assignments (3)	30 pts
Final exam	200 pts

Do not expect a curve or extra credit. There is a total of 700 points. At the end of the Semester, grades will be assigned based on the following scale: 90%: A, 80%: B, 70%: C, 60%: D, Below 60%: E

Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.). Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave and may be reported to the Dean of Students.

Links to the following UA policies are provided here: https://academicaffairs.arizona.edu/syllabus-policies

- **Absence and Class Participation Policies**
- **Threatening Behavior Policy**
- **Accessibility and Accommodations Policy**
- **Code of Academic Integrity**
- **Nondiscrimination and Anti-Harassment Policy**

Subject to Change Statement: The information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Tentative Weekly Schedule

Week	Start Date	Chapters in Textbook	Topics Covered
1	Jan 13 Jan 20	Chapters 1 and 2	Introduction, Picturing Distributions with Graphs, Describing Distributions with Numbers
2	Jan 27	Chapter 3	Normal Distribution
3	Feb 3	Chapters 4 and 5	Scatterplots, Correlation, Linear Regression
4	Feb 10	Chapters 8 and 9	Design of Sample and Experiment
5	Feb 17	Chapter 12	Introduction to Probability, **MIDTERM 1**
6	Feb 24	Chapter 13	General Rules of Probability
7	Mar 2	Chapter 14	Binomial Distributions
8	Mar 9		Spring break
9	Mar 16	Chapters 15 and 16	Sampling Distributions, Confidence Intervals
10	Mar 23	Chapter 17	Tests of Significance, **MIDTERM 2**
11	Mar 30	Chapter 18	Inference in Practice
12	April 6	Chapter 20	Inference on the Population Mean
13	April 13	Chapter 21	Comparing Two Means
14	April 20	Chapter 22	Inference on a Population Proportion
15	April 27	Chapter 23	Comparing Two Proportions, **MIDTERM 3**
16	May 4	Chapter 25	Chi-Squared Test