Math 115 Introduction to Statistics Spring 2019

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115A meets in Olin 113 on MWF 11:00-12:00. 115B meets in Olin 113 on MWF 1:30-2:30.

Office Hours: **MWF 12:15-1:15, Tues. 11:00-12:30**, **or by appointment.** If my office hours conflict with your schedule, talk to me after class or e-mail me to set up an appointment.

Textbook: **Moore, Notz, Fligner,** ***The Basic Practice of Statistics***, **7e**, Freeman, 2015. ISBN: 9781464142536.

Prerequisites: A basic level of competence in algebra (manipulating linear equations) is expected. A student will not receive credit for Math 115 if they already have credit for an introductory statistics course (Bio 256, Mgt 150, Psych 350, Soc 350).

Catalog description: The course uses data sets from the social and natural sciences to help students understand and interpret statistical information. Computer software is used to study data from graphical and numerical perspectives. Topics covered include descriptive statistics, correlation, linear regression, contingency tables, probability distributions, sampling methods, confidence intervals, and tests of hypotheses.

Course objectives: After completing this course, students should be able to 1) summarize the distribution of a variable with graphs and numbers, 2) describe the relationship between two variables and perform simple linear regression, 3) construct and interpret confidence intervals, 3) implement one- and two-sample hypothesis testing procedures for means and proportions, 4) correctly interpret *P*-values, 5) apply chi-square tests for independence and goodness-of-fit, and 6) carry out one-way ANOVA procedures.

Grades: The course grade will be determined from three exams (3×1/6), a final project (1/6), lab reports (1/6), and homework/attendance/participation (1/6). Grades are competency-based (my expectations) rather than curved (scores of other students).

Homework Policy: Read the assigned section before coming to class. Start working on the homework as soon as possible. Homework will be due **two class periods** after it is assigned, at the **beginning** of class. **Late homework will not be accepted without prior approval**.

Labs: There will be four lab assignments using **SPSS** to analyze a data set and Word to write a report on your findings. You will work with a **different partner on each lab.** Completion of each lab is mandatory.

Working with others:

- Discussing **homework** problems with classmates is encouraged. Standards of academic honesty apply to homework as well as exams: **what you turn in should be your own work.** The time and effort you expend on assignments will help prepare you for exams.
- **Lab** work should be evenly shared, and each partner should understand the entire activity. If you have questions about using SPSS, try its help menu or ask a classmate or ask me.
- **Exams** are measures of individual performance. Violations will be reported to the Honor Council.

Sources of Assistance:

- **The textbook**. Read the book! I will lecture on the main ideas and leave some of the details to the book. You can check answers to odd-numbered exercises in the back of the book, but always show your work on assignments, so that reviewing your homework will help you study for exams.
- **Math Clinic tutors** are available for homework help on Sunday through Thursday evenings, 7:00-9:00 p.m. in Olin 108.
- **My office hours**. Come prepared with specific questions. Get organized in the hallway, then knock on my door.
- **SASC** offers one-on-one tutoring; the earlier you ask, the more likely a tutor is available.

Diversity statement: I believe in fostering an inclusive learning environment. All students should enjoy an environment free of any form of harassment or discrimination. Members of the Luther community are expected to act respectfully toward each other, whatever our gender, sexuality, disability, religion, ethnicity, race, culture, or socioeconomic status. If you have a disability, please come to my office early in the semester to discuss your accommodation plan.

If you have a **conflict** with a scheduled exam, let me know at least **one week in advance.**

Week	Date	Chapter	Topics
1	W 2/6	1	Descriptive statistics: graphical
	F 2/8	2	Descriptive statistics: numerical
2	M 2/11	3	Normal distributions
	W 2/13	4	Scatterplots, correlation
	F 2/15	L	**Lab 1:** Descriptive statistics, scatterplots, correlation
3	M 2/18	5	Regression
	W 2/20	6	Two-way tables
	F 2/22	L	**Lab 2:** Regression
4	M 2/25	*7*	*Review, Read Ch. 7*
	W 2/27		**Exam 1: Descriptive Statistics**
	F 3/1	8	Sampling methods
5	M 3/4	9	Design of experiments
	W 3/6	12	Probability
	F 3/8	12	Discrete and continuous probability models
6	M 3/11	15	Sampling distributions, Law of Large Numbers
	W 3/13	15	Central Limit Theorem
	F 3/15	16	Confidence intervals
7	M 3/18	*19*	*Review, Read Ch. 19*
	W 3/20		**Exam 2: Probability**
	F 3/22	17	Significance tests, hypotheses, *P*-values
	S 3/23 – N 3/31		*Spring Break*
8	M 4/1	18	One-sample *z*-test for a population mean, assumptions
	W 4/3	20	One-sample *t*-test, matched pairs
	F 4/5	21	Comparing two means, two-sample *t*-test
9	M 4/8	L	**Lab 3:** Inference for means, *t*-tests
	W 4/10	22	Inference for a proportion
	F 4/12	23	Comparing two proportions
10	M 4/15	25	Chi-square test of independence
	W 4/17	25	Chi-square test for goodness-of-fit
	F 4/19 – M 4/22		*Easter Break*
11	W 4/24	L	**Lab 4:** Chi-square tests
	F 4/26	*24*	*Review, Read Ch. 24*
12	**M 4/29**		**Exam 3: Inference**
	W 5/1	27	One-way ANOVA for comparing several means
	F 5/3	27	ANOVA *F*-statistic, discuss final project
13	M 5/6	L	search for data sets
	W 5/8	L	import data sets, explore data, **submit prospectus**
	F 5/10		*Research Day – no classes*
14	M 5/13	L	work on final project, *evaluations*
	W 5/15	L	work on final project
	F 5/17	L	work on final project
115A: Mon. 5/20, 10:15-12:15 a.m. **115B: Wed. 5/22, 1:15-3:15 p.m.**			**Final Project: Poster Presentations**