

Introduction to Mathematical Statistics II

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Office Hours	T 3-4pm and W 1-2pm
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Office Hours	M 4-5pm and W 4-5pm
Class Hours	MWF 9:55-10:45 in B302 Birge
Discussions	311: W 1:20 in 0394 Van Hise 312: W 12:05 in 214 Ingraham 313: R 1:20 in 116 Ingraham
Textbook (required)	<i>Probability & Statistics for Engineering and the Sciences</i> , 8th edition, by Jay L. Devore
Web	learn@UW

- **Course Objective.** The goal is to provide undergraduate students with a theoretical and applied background to modern statistical inference. Calculus-based probability theory will be assumed, such as covered by Statistics 309 or Stat/Math 431. From this foundational background, students will be able to go on to more specialized statistical courses.
- **Computing.** We will make use of the software R, for data visualization, practical statistical analysis, and for conducting simulation experiments. R is open source, free and available on all platforms (Windows, Mac and linux), and is of growing importance in both academic and corporate environments. Being proficient in R is a skill that reads well on a CV.
- **Homework.** There will be weekly homework assignments. Doing homework on a regular basis is the best way to learn. Much of your learning will take place while working the problems. Homework has 2 aspects: It is THE way to make yours all what you read and listen to, and it will provide you with feedback on your work. Homework will be posted on the course's web page on Fridays, due the following Friday in your TA's mailbox by 4pm, and returned the following week in discussion section. Each assignment will be graded on a total of 10 points. Assignments turned 3 days late by noon on Mondays will receive a maximum of 5 points. Assignments turned later than that will not receive any credit. Late assignments may be accepted with no penalty under extenuating circumstances and *if prior* arrangements have been made with me. Your homework solutions should be well organized and neat. If your assignment does not make it easy for the grader to follow your approach to each solution, because of organization or hand-writing, your grade assignment will be lowered by 2 points.
- **Grading.** There will be two midterm exams and a final exam. Exams will cover lecture materials, handouts, homework and readings in the text. Midterm exams will be on Monday **Feb. 25** and Monday **April 15**, both during the regular class time (room TBD). The final exam will be Tuesday **May 14** at 10:05 am - 12:05 pm. Each midterm will count for 20% of the course score, the homework will count for 20% and the final exam for 40%. Letter grades will depend on the course scores based on a curve. I will not give letter grades for midterm exams.

- **Honors.** Students taking the course for honors will complete a project of particularly challenging problems, including computer work. If you are taking the course for honors, you need to contact me early in the semester.
- **Academic honesty.** You are encouraged to talk to other students, your teaching assistant or me about your homework. I am convinced it is very beneficial to solve problems with other students, share and discuss ideas. However, you may not present other people's work as your own. If you work with other students solving problems, you still have to write up your own solution independently. You must work independently during exams. You may not share calculators or pass notes or use laptops or cell phones during exams.
- **Tentative Schedule.** We will cover chapters 1, 6-9 and some selected topics in chapters 10-15.

WF 1/23,25	Introduction, descriptive stat and data visualization	Ch. 1
MWF 1/28,30 & 2/1	Point estimation: MSE, bias, MVUE, SE	Ch. 6
MWF 2/4,6,8	Method of moments, maximum likelihood	Ch. 6
MWF 2/11,13,15	Interval estimation: for general estimators	Ch. 7
MWF 2/18,20,22	Interval estimation (cont.): for a mean	Ch. 7
M 2/25	Midterm	Ch. 1, 6, 7
WF 2/27, 3/1	Interval estimation (cont.): proportions, variances	Ch. 7
MWF 3/4,6,8	Hypothesis testing: error types, test for one mean, for one proportion	Ch. 8
MWF 3/11,13,15	sample size determination, p-values	Ch. 8
MWF 3/18,20,22	Two sample comparison: for means	Ch. 9
MWF 3/25-29	Spring recess	
MWF 4/1,3,5	sample size determination, paired samples	Ch. 9
MWF 4/8,10,12	Two sample comparison for proportions	Ch. 9
M 4/15	Midterm 2	cumulative
WF 4/17,19	Likelihood ratio test (Normal, Poisson, Binomial models)	
MWF 4/22,24,26	Analysis of variance: one factor	Ch. 10
MWF 4/29 & 5/1,3	ANOVA: power, variance stabilizing transformations	Ch. 10
MW 5/6,8	Multiple comparisons	Ch. 10
F 5/10	If time permits: Categorical data analysis	Ch. 12
T 5/14	Review: bring your questions	
	Final exam	cumulative