

STAT 422 Mathematical Statistics
Spring 2019, MWF 9:00-9:50, Math 312

Course Information

- **Instructor:** David Patterson, Math 208, 243-6748, david.patterson@umontana.edu
- **Textbook:** Probability and Statistics , 3rd or 4th ed., DeGroot and Schervish
- **Prerequisites:** M 273 (Multivariable Calculus), M 307 (Intro to Abstract Math)
- **Software:** Some assignments will require the use of R. R is a free program which can be downloaded from <http://www.r-project.org/>. It is also available in the Math 206 computer lab. It is helpful to also learn to use Latex, a mathematical document preparation program. More details on both programs is provided on the Moodle page.
- **Office Hours:** See Moodle page

Grading (+/- grading will be used):

- Homework: 20%
- Midterm Exams 1,2: 20% each (dates to be determined)
- Weekly quizzes (10 best, no makeups): 15%
- Final Exam: 25%

STAT 422 is the second semester of a year-long course in probability and mathematical statistics. In the second semester, we will cover Chapters 6-8 plus some additional material. Use of computer software (R, mainly) will be integrated into the course as needed.

Catalog description:

Offered spring. Prereq., STAT 421. Introduction to the theory of point estimation, interval estimation, and hypothesis testing. Level: Undergraduate-Graduate

Learning Goals:

1. To understand how to derive estimators and their properties, such as distribution, variance, bias, MSE, and consistency and other asymptotic properties.
2. To understand the theory behind confidence intervals and hypothesis tests.
3. To understand likelihood theory and apply it to estimation and hypothesis testing.
4. To gain an understanding of the theory behind normal-based inference procedures for the one and two-sample problems.
5. To be able to use software to obtain numerical solutions to problems where analytical solutions are not possible and to carry out simulations to compare inference procedures.

Homework

Homework will be assigned about every week, to be handed in about one week later. Up to two late homeworks will be accepted without penalty if they are handed in by the start of the next class. In addition, your lowest homework score will be dropped. Homework is vital to your success in this class. Working with other students on homework is allowed and even

encouraged, so long as you hand in your own work, and do not simply copy someone else's work.

Quizzes

A 10-minute quiz (one problem) will be given every week on current material. No makeups are allowed for any reason. Your 10 best quiz scores are worth 15%.

Midterm Exams

The exams will be either open book/open notes or a combination of closed book/closed notes and open book/open notes. The exact dates will be given later. If you cannot make it to an exam for a good reason, please let me know well ahead of time.

Final Exam

10:10-12:10 am, Tuesday, April 30.

Important dates:

- **Monday, January 21:** Martin Luther King, Jr. Day, no classes.
- **Thursday, January 31:** last day to drop course with refund. A "W" will appear on transcript for courses dropped after this date.
- **Monday, February 18:** Presidents' Day, no classes.
- **Friday, March 15:** last day to drop course with instructor's and advisor's signatures. After this date changes require Dean's signature and a WP or WF will appear on transcript.
- **Mon-Fri, March 25-29:** Spring break, no classes.
- **Friday, April 26:** last day of classes.
- **Tuesday, April 30, 10:10-12:10:** Final Exam

Incompletes

Incompletes are given at the discretion of the instructor and are only considered in cases where the student has been in attendance and doing passing work up to three weeks before the end of the semester, and for reasons beyond the student's control and which are acceptable to the instructor, the student has been unable to complete the requirements of the course on time. Negligence and indifference are not acceptable reasons.

Students with disabilities are welcome to discuss accommodations with me.

Academic Honesty

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary action by the University. All students need to be familiar with the Student Conduct Code. You can find it in the A-Z index on the UM home page.