

STT 442 - 001: Probability and Statistics II

Fall, 2019

E-mail: ikpedenn@msu.edu

Class Hours: M W F 9:10 -10:00am

Office: C401 Wells Hall

Instructor: Dennis Ikpe

Web: <https://d2l.msu.edu/d2l/home/831576>

Class Room: 111 Berkey Hall

Office Hours: M W 1:45 - 2:45 p.m.
and by appointment

Course Description

The specific topics of the course include point estimation, interval estimation, hypothesis testing, likelihood method, nonparametric methods, simple and multiple regression analysis, time series (ARMA model, data analysis, forecasting) and other topics. The course will cover Chapters 5-9, and Chapters 11-14. We will make use of computers where they will help to improve our understanding of fundamental concepts of the course, or where they will perform tedious calculations quickly. We will use applications from a statistical package (such as MINITAB and R).

Required Materials

- **Book:** Mathematical Statistics and Data Analysis, 3rd Edition, by John Rice
- **Graphing Calculator:** Graphing calculator capable of calculating probability distributions- e.g. TI-83/84, TI-89, TI-Nspire, or similar

Prerequisites/Corequisites

- (MTH 309 or MTH 314 or MTH 415) and STT 441, or equivalent courses.

Homework

Practice as many problems as you can from the text. The book has solutions to most odd-numbered problems and it is recommended that you try these problems out on your own. I will work out some of the problems in class and will give you a list of problems to work on. While I would encourage you to work out all the problems in the text these are the minimum that you should work on. A few of these problems will be chosen randomly as in-class quiz problems.

Quizzes and Exams

There will be **seven** quizzes, two in-class exams during the semester and a final exam during the finals week. The final exam will be **cumulative**.

Grading Policy

The following grading scale will be used. I reserve the right to curve the scale dependent on overall class scores and a student's class attendance record at the end of the semester. The grade will count the assessments using the following proportions:

- 30% of your grade will be determined by **two** in class midterm exams (15% each).
- 35% of your grade will be determined by **seven** quizzes
- 35% of your grade will be determined by the final exam

Extra Credits: There will be a 3% extra credit for attendance and participation. There is no other form of extra credits. This class will not be curved. Attendance will be taken at the instructor's discretion.

The final grade would be based on your total grade percentage and will be determined roughly as:

Percentage	90-100	80-90	70-80	65-70	60-65	55-60	50-55	0-50
Grade	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.0

Course Policies

During Class

I understand that the electronic recording of notes will be important for class and so computers will be allowed in class. Please refrain from using computers for anything but activities related to the class. Phones are prohibited as they are rarely useful for anything in the course. Eating and drinking are allowed in class but please refrain from it affecting the course. Try not to eat your breakfast in class as the classes are typically active.

Attendance Policy

Attendance is expected in all lecture and lab sections. Valid excuses for absence will be accepted before class. In extenuating circumstances, valid excuses with proof will be accepted after class. Make up quizzes will be granted for no penalty if a valid excuse is communicated to the instructor before the quiz day. After the quiz day, make up quiz will be granted for a 50% deduction to the score up to 2 days. After this no make up of a missed quiz will be granted.

Academic Integrity and Honesty

The Department of Statistics and Probability adheres to the policies of academic honesty as specified in the General Student Regulations 1.0, Protection of Scholarships and Grades, and in the All-University of Integrity of Scholarship and Grades which are included in Spartan Life: Student Handbook and Resource Guide.

Schedule and weekly learning goals

The schedule is tentative and subject to change. The learning goals below should be viewed as the key concepts you should grasp after each week, and also as a study guide before each exam, and at the end of the semester. Each exam will test on the material that was taught up until 1 week prior to the exam (i.e. fitting probability distribution will not be tested until exam 2). The applications in the second half of the semester tend to build on the concepts in the first half of the semester though, so it is still important to at least review those concepts throughout the semester.

Week 01, 08/26 - 08/30: LLN, Convergence & CLT

Week 02, 09/02 - 09/06: χ^2 , t , and F Distributions, The Sample mean and Variance, & **Quiz 1** (Sept 6 2019, 9: 40am-10:00am)

Week 03, 09/09 - 09/13: Population Parameters & Simple Random Sampling, Estimation

Week 04, 09/16 - 09/20: Methods of Maximum Likelihood, & **Quiz 2** (Sept 20 2019, 9: 40am-10:00am)

Week 05, 09/23 - 09/27: The Bayesian Approach, & **Exam 1** (Sept 27 2019, 9:10am-10:00am)

Week 06, 09/30 - 10/04: Confidence interval and Hypotheses Tests, & **Quiz 3** (Oct 04 2019, 9: 40am-10:00am)

Week 07, 10/07 - 10/11: Multinomial Distribution, Poisson Tests

Week 08, 10/14 - 10/18: Summarising Data and Comparing Two Independent Samples, & **Quiz 4** (Oct 18 2019, 9: 40am-10:00am)

Week 09, 10/21 - 10/25: Comparing Paired Samples, Experimental Design

Week 10, 10/28 - 11/01: The Analysis of Variance, Fisher's Exact Test, & **Exam 2** (Nov 01 2019, 9:10am-10:00am)

Week 11, 11/04 - 11/08: Chi-Square Tests of Homogeneity & independence, & **Quiz 5** (Nov 08 2019, 9: 40am-10:00am)

Week 12, 11/11 - 11/15: Matched- Pairs Designs & Odds Ratios

Week 13, 11/18 - 11/22: Simple Linear Regression, & **Quiz 6** (Nov 22 2019, 9: 40am-10:00am)

Week 14, 11/25 - 11/29: The Matrix Approach to Linear Least Squares, & **Quiz 7** (Nov 29 2019, 9: 40am-10:00am)

Week 15, 12/02 - 12/06: Review & catching up

Week 16, 12/09 - 12/13: Final Exam (Dec 12 2019, 7: 45am-9:45am)

Important Dates Fall, 2019

Last day to drop with refund (8:00pm)

9/23/2019

Wednesday, 8/28	Classes begin
Monday, 9/2	Holiday – University closed
Wednesday, 10/16	Middle of semester
Thursday, 11/28 – Friday, 11/29	Holiday – University closed
Friday, 12/6	Classes End
Monday, 12/9	Final Exam