

Syllabus: MAT 525: Introduction to Probability and Statistics, 2016 Summer Session II

Instructor: Professor Pinyuen Chen
Carnegie 316 B
443-1577
pinchen@syr.edu

Text: Probability and Statistics, 4th Edition, Morris H. DeGroot and Mark J. Schervish,
Addison Wesley

Course Description:

Most contents in Sections 5.6 – 9.5 of the textbook will be covered.

The course will discuss statistical estimation and hypothesis testing. Point estimation will be taught with discussion on efficiency. Interval estimation and hypothesis testing will be discussed focusing on the likelihood ratio test. Goals of this course would be to understand basic ideas of statistical inference (estimation and testing), to learn the theoretical basis of fundamental inferential procedure, and to apply them in real data analysis.

See Page 2 for more details.

Prerequisite: Calculus and MAT 521 or equivalent. You need at least 12 credit hours of calculus to be able to handle the multiple integration and infinite series in the course.

Calculator: You will need a calculator for the course. No specific calculator is required.

Grading Policy: Homework & Quizzes (40%), Exam 1 (30%), Exam 2 (30%)

Course Rules:

1. There will be **NO** make-up quizzes and exams.
2. Students are expected to attend the class. Attendance record collected through quizzes and class surveys will be considered toward the extra credit.
3. Homework may be collected based on the availability of the grader. Quiz problems will be similar to HW questions.
4. All cases of academic dishonesty will result in a grade of "F" and will be reported to the Office of the Dean.
5. Students with disabilities who need special accommodations should contact the instructor as soon as possible.

MAT 525 Tentative Schedule

Course Schedule:

Tuesday July 5

- D & S 5.6 The Normal Distributions

Wednesday July 6

- D & S 5.7 The Gamma Distributions

Thursday July 7

- D & S 5.8 The Beta Distributions

Monday July 11

- D & S 6.2 The Law of Large numbers
- D & S 6.3 The Central Limit Theorem

Tuesday July 12

- D & S 6.4 The Correction for Continuity
- D & S 7.5 MLE

Wednesday July 13

- D & S 7.6 Properties of Maximum Likelihood Estimators;
- D & S 7.7 Sufficient Statistics

Thursday July 14

- D & S 7.8 Joint Sufficient Statistics
- D & S 7.9 Improving an estimator

Monday July 18

- HW discussion

Tuesday July 19

- **EXAM 1**

Wednesday July 20

- D & S 8.1 Sampling Distribution;
- D & S 8.2 Chi-Square distribution;

Thursday July 21

- D & S 8.3 Sample mean and sample variance;
- D & S 8.4 The t Distribution.

Monday July 25

- D & S 8.5 Confidence Intervals
- D & S 8.7 Unbiased Estimators

Tuesday July 26

- D & S 8.8 Fisher Information

Wednesday July 27

- D & S 9.1 Testing hypotheses

Thursday July 28

- D & S 9.2 Testing Simple Hypotheses

Monday August 1

- D & S 9.3 Uniformly Most Powerful Tests

Tuesday August 2

- D & S 9.4 Two-Sided Alternatives

Wednesday August 3

- D & S 9.5 The t tests

Thursday August 4

- D & S 9.6 Comparing the Means of two Normal Distributions

Monday August 8

- **D & S 9.7 The F distribution**

Tuesday August 9

- **Home Work Discussion**

Wednesday August 10

- **Review**

Thursday August 11

- **Exam 2**

Learning Goals

Students will be expected to

- 1) use and understand basic mathematical notation;
- 2) select and apply an appropriate mathematical model for certain elementary probabilistic problems;
- 3) do basic hand calculations with accuracy;
- 4) use appropriate hardware and/or software related to certain probability distributions.

Students with Disabilities: If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), <http://disabilityservices.syr.edu>, located in Room 303 of 804 University Avenue, or call 315-443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible coordinating disability-related accommodations and will issue students with documented Disabilities Accommodation Authorization

Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. You are also welcome to contact me privately to discuss your academic needs although I cannot arrange for disability-related accommodations.

Academic Integrity: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see <http://academicintegrity.syr.edu>

Religious observances policy. SU religious observances policy recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice (Student Services -> Enrollment -> My Religious Observances) from the first day of class until the end of the second week of class.