

Syllabus: MAT 525: Introduction to Probability and Statistics, 2014 Summer Session II

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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 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 (20%), Quizzes (20%), Exam 1 (30%), Exam 2 (30%)

Course Rules:

1. There are NO make-up exams except rare situations.
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:

Monday June 30

- D & S 5.6 The Normal Distributions

Tuesday July 1

- D & S 5.7 The Gamma Distributions

Wednesday July 2

- D & S 5.8 The Beta Distributions

Thursday July 3

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

Monday July 7

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

Tuesday July 8

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

Wednesday July 9

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

Thursday July 10

- HW discussion

Monday July 14

- **EXAM 1**

Tuesday July 15

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

Wednesday July 16

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

Thursday July 17

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

Monday July 21

- D & S 8.8 Fisher Information

Tuesday July 22

- D & S 9.1 Testing hypotheses

Wednesday July 23

- D & S 9.2 Testing Simple Hypotheses

Thursday July 24

- D & S 9.3 Uniformly Most Powerful Tests

Monday July 28

- D & S 9.4 Two-Sided Alternatives

Tuesday July 29

- D & S 9.5 The t tests

Wednesday July 30

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

Thursday July 31

- D & S 9.7 The F distribution

Monday August 4

- Home Work Discussion

Tuesday August 5

- Review

Wednesday August 6

- Review

Thursday August 7

- **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.

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>

Disability

Students who may need academic accommodations due to a disability are encouraged to discuss their needs with the instructor at the beginning of the semester. In order to obtain authorized accommodations, students should be registered with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498 and have an updated accommodation letter for the instructor. Accommodations and related support services such as exam administration are not provided retroactively and must be requested in advance."

For more information about services and policy, see [Office of Disability Services](#)

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