New York University – Courant Math
Course Syllabus for MA-UA 234 Mathematical Statistics
Spring 2019
Course Instructor: Yisong Yang
Lecture room and time: WWH 202; 3:30pm-4:45pm Tuesdays & Thursdays
Office: WWH 726
Email: yisongyang@nyu.edu
Office Hours: Thursday 1:00pm—3:00pm or by appointment

Recitation Instructor: Alexisz Gaal
Recitation room and time: WWH 312; 3:30pm-4:45pm Fridays

Course Pre-requisites: MA-UA 233 or equivalent

Main Textbook:
All of Statistics, Larry Wasserman, Springer-Verlag 2004, ISBN 0-387-40272-1

Course Description:
Mathematical Statistics is a subject that organizes, analyzes, and interprets the data collected regarding a random phenomenon and makes scientifically grounded inference about the random phenomenon using mathematical tools such as probability theory, linear algebra, calculus, optimization. Topics to be covered in this introductory course will include sampling theory, parametric and non-parametric estimations, significance tests, hypothesis testing, likelihood methods, the Bayesian analysis/statistics, statistical decision making, regression, etc.

Course Content:
The core course content will be Chapters 6,7, 9 – 13 of our main textbook plus sampling theory and sampling distributions.

Unit 1: Models, statistical inference and learning (Chapter 6)

Unit 2: Non-parametric inference (Chapter 7)

Unit 3: Parametric inference (Chapter 9)

Unit 4: Hypothesis testing (Chapter 10)

Unit 5: Bayesian inference (Chapter 11)

Unit 6: Statistical decision making (Chapter 12)

Unit 7: Regression (Chapter 13)

Unit 8: Sampling theory and sampling distributions (to be developed and presented at due places wherever needed)

(Note: The above is a topic list but not a topic schedule.)

We aim to achieve a thorough mathematical understanding on various subjects of study rather than present stacks of methods as work recipes.

Course Structure:
The 3-credit, full-semester course meets for lecture twice a week for 1 hour and 15 minutes each time. In addition, each Friday, there will be a recitation session where homework problems, conceptual issues, and related computational questions will be discussed. Homework will be assigned on a weekly basis and collected and graded. No computational projects will be given separately.

Examinations: One 75-minute Midterm Exam will be given during class time, and a *cumulative* Final Exam will be given at the end of the semester.

Exam Dates (tentative):
- Midterm Exam: Thursday, March 14, 2019 in class.
- Final Exam: **To be announced.**

Homework:
We will collect and grade about 12 homework assignments. Your homework scores will be based on the best 10 of these. Due time: Homework assigned in a week will be due at the recitation session of the next week.

Grading Policy

Course Grade: Final grades will be calculated according to the rules below. The course grade is determined by the best of your course averages using the table below.

	Average 1	Average 2
Midterm	30%	10%
Final Exam	50%	70%
Homework	20%	20%

Grade scale conversion: 90% or better = A; 80% or better = B; 65% or better = C; 50% or better = D; below 50% = F

Make-up Policy
A make-up exam may only be arranged due to documented medical emergencies or a family crisis so that a student has to miss a scheduled exam.

No homework may be made up.

Incomplete Grade Policy
An "Incomplete" grade may only be issued to a student who is unable to take the final exam due to documented medical emergencies or a family crisis but has fulfilled other course requirements.

In case of confusion or conflict, we will always follow the school policies which can be found at the school website or from other official sources.

-End of Syllabus-