

Math 3081- Probability and Statistics (Fall 2020-Section 2- CRN 10521)

Instructor: He Wang

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Class time and location: 10:30 am - 11:35 am MWR at West Village G 104

Office Hours: (On Zoom) Tuesday 8-9am. 5-7pm and other time by appointment.

Zoom Link for office hours: Join Zoom Meeting

<https://northeastern.zoom.us/j/9798680433?pwd=SHpOOFFhYTJVVTRzemlVYnJNMTJBdz09>

Meeting ID: 979 868 0433

Passcode: 2020HeWang

Text: An Introduction to Mathematical Statistics and its Applications, R. Larsen and M. Marx, 6th edition. published by Pearson. (It is **not** required that you purchase a printed textbook.)

This is an introduction course to the theory of probability and statistics. Its goal is to develop the mathematical tools and concepts necessary for modeling uncertainty and data analysis in real-world problem. This is a Calculus-based course and assumes a working knowledge of single-variable calculus as well as some acquaintance with multi-variable calculus (including multiple integration).

NUFlex hybrid lectures and learning: This section is taught using NUFlex method. I will lecture in person on campus and the class is available on Zoom lively. A day-by-day guide will be shared each week in Canvas. We will *approximately* follow the tentative pacing guide at the end of the syllabus. (Detailed suggestions about learning method are on **Canvas**) It is possible to fall behind in a single day. If you miss a lesson for any reason, make an immediate attempt to contact the instructor to discuss how to catch up. **It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced on Canvas/email.** Read all emails and announcements.

TA's and Recitation MATH 3082:

There are three TAs assigned to the course: Xin Shen, Jiewei Feng, and Xuezhu Lu. Their office hours will be announced later.

There is a **recitation** for the course, **MATH 3082**, on Mondays from 4:35-5:40 in 454 RY (this may change). It is a voluntary session for questions and help with homework.

Homework and take-home quizzes:

Homework is an essential component of the course, and together with some take-home quizzes make up 15% of the course grade. Students should schedule typically around 5 hours every week to work on it. It will be assigned at the end of every class on Canvas and will be due weekly, and graded partially. (Due day and time will be announced on Canvas.) A completeness grade, ranging from 0 to 4 points will be given for the homework, and 6 problems, each worth 1 points, will be graded. Students are encouraged to discuss on the homework, but the write-ups must be done separately. Take-home quizzes will be announced later in the process of the classes. Late homework will not be accepted but one lowest score will be dropped. **Only a final result without explanation, or copied answer from solution book will receive no point. To get full points of homework, answer the questions in order, label the section and question number, write the answer clearly and circle the final result. Submit the homework on Canvas/Assignment in a single pdf file.**

Grading:

15% Homework and take-home quizzes

55% 3 Tests

30% Final Exam

(0.5 and more will be rounded up to 1, 0 to 0.49 to 0.)

Tests: We will have **three 65-minute tests** during the first seven weeks of the semester. No dropped score on tests. However, the lowest test score counts 15%, the other two tests count 20% each. The tentative dates for the three exams are **Thursdays: Oct 1. Oct 29. Nov 19.**

Final Exam: The 2 hours required cumulative final exam on the **final exam day (to be scheduled)**. All will be administered via Canvas.

NOTE: This course, or parts of this course, may be recorded by instructor for educational purposes. These recordings will be made available on Canvas only to students enrolled in the course, the TAs and instructors, and other math department or administrative personnel for training, oversight, or evaluation purposes. If you have any concerns, please let me know.

Only students who have arranged an accommodation with the Disability Resource Center may use mechanical or electronic transcribing, recording, or communication devices in the classroom. Students with disabilities who believe they may need such an accommodation may contact the Disabilities Resource Center.

IMPORTANT:

1. The best way to learn this material is to do the homework problems every week. Please ask me questions about things you don't understand, either in class or at my office. DON'T wait until you feel completely lost!
2. It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced in class, or as posted on the course webpage. Students are responsible for all information given when they are absent.
3. We need to use a calculator for the homework and exams after Chapter 4. (TI-83/ TI-84 or above will be enough). Computer software R is highly recommend for working on a project or lab (a short introduction will be on Canvas after we start learning statistics).
4. The grade I (Incomplete) will be given only if you have a good attendance record, have missed the Final for a good reason, and otherwise are doing passing work. Makeup exams are not given unless you have missed the exam for a valid reason and can prove it. Both makeups and incomplete are given at the discretion of the instructor.
5. Cheating will not be tolerated. All incidents of cheating will be reported to the Office of Judicial Affairs. The University's cheating policy and related disciplinary actions are detailed in the Student Handbook. The Handbook also includes a description of what is considered cheating by the University. Cheating in this class includes (but is not limited to): looking at the papers of others during a quiz or test, talking to other students during a quiz or test. See <http://www.northeastern.edu/osccr/academicintegrity>
6. If you have a concern about the course or the instructor that is not or cannot be resolved by speaking with the instructor, the next step is to contact the next step is to speak with the course coordinator John Lindhe, x4882, j.lindhe@northeastern.edu. For matters that remain unresolved Prof. Alexander Martsinkovsky, at a.martinkovsky@northeastern.edu.
7. All students without legitimate conflicts will take the final exam at the scheduled date and time. Do not make travel plans that conflict with the final exam.
8. The last day to drop a course without a W grade is Tuesday September 29. The last day to drop a course with a W grade is Thursday December 10. The last day to submit a Final Exam conflict form is Friday October 2.
9. Free tutoring is available via the Peer Tutoring Program. All tutoring sessions will be online and appointments can be made via your mynortheastern portal. The free tutoring center is expected to start soon after the semester begins. Students sign up through their MyNortheastern (you can look at it here: <https://undergraduate.northeastern.edu/peer-tutoring/>) where they can see the available tutors and the classes that each tutor will be able to help you with.
10. You are expected to fill out the **TRACE** evaluations at the end of the semester.

Math 3081 PACING GUIDE, Fall 2020
(TENTATIVE GUIDELINE: SUBJECT TO CHANGE)

Week	Sec.	Topic
Sept. 9-11	2.2 2.3 2.4	Sample Spaces and the Algebra of Sets The Probability Function Conditional Probability
Sept.14-18	2.4 2.5 2.6	Conditional Probability, <i>Continued</i> Independence Combinatorics
Sept. 21-25	3.2 3.3 3.4	Binomial Probabilities Discrete Random Variables Continuous Random Variables
Sept. 28-Oct 2	3.5	Expected Values Test 1 (Oct1)
Oct. 5-9	3.6 3.7	The Variance Joint Densities
Oct. 12 Oct 13-16	3.9 4.2	Columbus/Indigenous People's Day: No Class Further Properties of the Mean and Variance The Poisson Distribution
Oct. 19-23	4.3	The Normal Distribution
Oct. 26-30	5.2 5.4	Estimating Parameters Properties of Estimators Test 2. (Oct29)
Nov. 2-6	5.3	Interval Estimation
Nov. 9-13 Nov 11	6.2 6.3	Hypothesis tests Testing Binomial Data Veteran's Day: No Class
Nov. 16-20	7.2 7.3 7.4 6.4	The t-distribution Deriving the t-distribution Drawing Inferences about μ Type I and Type II Errors Test 3. (Nov19)
Nov. 23-24 Nov. 25-27	9.2 9.4	Testing $H_0: \mu_X = \mu_Y$ Binomial Data: Testing $H_0: p_X = p_Y$ Thanksgiving: No Classes
Nov. 30-Dec 4	7.5 9.3	Drawing Inferences about σ^2 The F-test
Dec. 7-9 Dec. 10		Final Review Reading Day: No Classes
TBA		Final Exam (Final Exams from Dec. 11- 18)