

DEPARTMENT OF MATHEMATICS  
NORTHEASTERN UNIVERSITY

MATH 3081: PROBABILITY AND STATISTICS  
SECTION 02 (MORNING) AND 03 (AFTERNOON)

FALL 2013

Version: September 4, 2013<sup>1</sup>

**Class:** (please double-check in what section you are)

Section 02 (“morning”): MWR 10:30–11:35, Forsyth Building (FR) 151

Section 03 (“afternoon”): MW 2:50–4:30, Shillman Hall (SH) 325

**Instructor:** Leonid Petrov

**Office:** 433 Lake Hall; phone 617-373-3893

**email:** [l.petrov@neu.edu](mailto:l.petrov@neu.edu) (preferred), [lenia.petrov@gmail.com](mailto:lenia.petrov@gmail.com)

**Office hours:** Monday and Wednesday 12:30pm –2:00pm, or by appointment (I encourage you to make as many appointments as you need if you have a scheduling conflict with my official hours. The preferred way to make them is by email.)

**Course coordinator:** John Lindhe, 543NI, 617-373-4882, [j.lindhe@neu.edu](mailto:j.lindhe@neu.edu).

**Teaching assistant:** Liwei Zhang, 527 NI, 617-373-5525, [zhang.liw@husky.neu.edu](mailto:zhang.liw@husky.neu.edu).

**TA’s office hours:** Tuesday and Thursday: 5:00pm — 6:30pm

**Course webpage:** on Blackboard

**Books:**

**Main textbook:** “An Introduction to Mathematical Statistics and its Applications”, R. Larsen and M. Marx, fifth edition. (published by Prentice Hall).

**Additional (more advanced) book:** “Introduction to Probability”, C.M. Grinstead and J.L. Snell. This work is freely accessible under the terms of the GNU Free Documentation License at <http://www.math.dartmouth.edu/~prob/prob/prob.pdf>

**Tests:**

There will be several **in-class tests** including the 1-hour midterm exam. **Homework problems** will be assigned each week. These assignments will be collected, and **every other assignment will be graded.**

**Do not miss in-class tests!** If you miss them due to illness or other significant reason, a doctor’s letter/other proof is required. Then the next test/HW assignment will be counted twice to replace the missing test. In an **exceptional** situation, some makeup work could be assigned instead.

At the end of the term, there will be a two-hour departmental **final exam**. It will count as at least 40% of your grade in this course. You must take the final exam during the time it is scheduled unless you have a registrar-created conflict. **Do not make travel plans that conflict with the exam.**

**Grading:**

The overall course grade will be calculated using the recipe

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<sup>1</sup>It is your responsibility to be aware of any changes the instructor may make to the syllabus as they are announced in class. Students are responsible for all information given when they are absent. Always check if you have the latest version of the syllabus.

Graded HWs	15–20%
Quizzes	15–20%
Midterm	20–30%
Final exam	40–50%

However, these numbers are subject to change in the end of the semester depending on the class performance.

Letter grades for the course are determined from the numerical grades as follows:

$$\begin{aligned}
 & A > 92, & 92 \geq A- > 89, \\
 & 89 \geq B+ > 86, & 86 \geq B > 82, & 82 \geq B- > 79, \\
 & 79 \geq C+ > 76, & 76 \geq C > 72, & 72 \geq C- > 69, \\
 & 69 \geq D+ > 66, & 66 \geq D > 62, & 62 \geq D- > 59, \\
 & & & F \leq 59.
 \end{aligned}$$

Numerical grades may be curved before a letter grade is assigned.

**Syllabus:** (sections in the main textbook)

		classes*	HWs/tests	topics	sections
1	week of 9/4	WR	entrance test	introduction, sample space, events	1, 2.1-2.2
2	week of 9/9	MWR	GHW	probability assignments and axioms	2.3
3	week of 9/16	MWR	NGHW + Q	conditional probability and independence	2.4-2.5
4	week of 9/23	MWR	GHW	repeated trials, random variables	3.1-3.4
5	week of 9/30	MWR	NGHW + Q	random variables and distributions	3.1-3.4
6	week of 10/7	MWR	GHW	expectation and variance	3.5-3.7, 3.9
7	week of 10/16	WR	NGHW + Q	LLN, Poisson approximation	4.2, 4.3
8	week of 10/21	MWR	midterm	CLT, review	4.2, 4.3
9	week of 10/28	MWR	GHW	intro to statistics, confidence intervals	5.1, 5.3
10	week of 11/4	MWR	NGHW + Q	estimation, max likelihood, moments	5.2, 5.4
11	week of 11/13	WR	GHW	hypothesis testing, type I, II errors	6.1-6.4
12	week of 11/18	MWR	NGHW + Q	likelihood ratio, p-values, normal model	6.5, 7.1-7.4
13	week of 11/25	M		normal distribution, one-sample t-test	7.1-7.4
14	week of 12/2	MW	GHW	two-sample problems, review	9.1-9.4

\* — Thursday class only for the morning section.

No classes: 10/14, 11/11, 11/27, 11/28.

9/24: Last day to drop class without W grade

9/26: Last day to file final exam conflict form<sup>2</sup>

11/19: Last day to drop class with W grade

### Learning the material:

This is a rather intense course with a lot of material which is new to students. The best way to learn it is to do the homework problems every week. Assignments will be posted on the course webpage (at the Blackboard). Please ask me questions about things you don't understand, either in class or in my office. **DON'T wait until you feel completely lost!**

### Prerequisite:

This is a Calculus-based course, and assumes a working knowledge of single-variable calculus as well as some acquaintance with multi-variable calculus. **If you are not familiar with single-variable calculus, you should not take this course.**

There will be an entrance test during the first week, but its results will not count towards the course grade.

<sup>2</sup>Only two finals at the same time or three in one day is a University recognized legitimate reason to be excused from taking the final at the scheduled time. Students with such a conflict should complete a final exam conflict form, available on the registrar's website.

**Tutoring:**

Free tutoring will be available in room 540B Nightingale. All tutoring is done on a first come first served basis. Students should make appointments online <http://neumath.mywconline.com>, see also <http://www.northeastern.edu/csastutoring/>.

The schedule of the tutoring will be: Mon-Wed 10am — 8 pm, Thurs 10am — 6pm and Friday 10am — 1pm. The full schedule will start on Sept. 16th.

**IMPORTANT:**

**COMPUTERS, CELL-PHONES:** These must be turned off during the class.

**CHANGES IN THE SYLLABUS:** 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.

**ISSUES:** 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 speak with the course coordinator. If the course coordinator does not settle the matter, contact Professor David Massey 529NI, 617-373-5527, [d.massey@neu.edu](mailto:d.massey@neu.edu), or Professor D. King (Undergraduate Director), 447LA, 617-373-5679, [d.king@neu.edu](mailto:d.king@neu.edu).

**ACADEMIC HONESTY:** The Northeastern University's Rules of Academic Honesty and Integrity apply to this course. The following is taken from the Academic Integrity Policy: "A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire 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, using a mobile electronic device to acquire information during a test. All incidents of cheating will be reported to OSCCR (the Office of Student Conduct and Conflict Resolution).

For more information please see

<http://www.northeastern.edu/osccr/academichonesty.html>

**INCOMPLETE GRADE:** 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 you are doing passing work. Incomplete grade is given at discretion of instructor.

**CHANGE OF GRADES:** It is University policy that no grade, including an incomplete, can be changed after one year. Exceptions must be authorized by the Academic Standing Committee.

**FINAL EXAM TRAVEL PLANS:** It will not be possible to change the time and date of the final exam. So, all students without legitimate conflicts (approved by the instructor) will take the final exam at the scheduled date and time. Go to <http://www.registrar.neu.edu/finexsched.html> to see the dates of your final exam. **Do not make travel plans that conflict with the final exam.**

**TRACE EVALUATION:** It is expected that every student will complete the TRACE evaluation as part of the course. If most of the students complete the evaluation, there could be a small bonus in grading.

**FINAL GRADE DISPUTE:** You could formally dispute the final course grade after the semester ends. Your first step should be to contact the instructor. If you cannot reach the instructor, or the instructor does not resolve the dispute to your satisfaction, you should go to the Course Coordinator. If the dispute is still unresolved, you should go to Donika, in the undergraduate office (533 LA), and fill out a grade dispute form. Once a complaint is filed, it will go to the Chair of The Undergraduate Committee.