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My profile	MWF 2:30-3:20, 224 Malott Hall.
My courses	
Math 4740	Personnel
Participants	• Instructor: Nate Eldredge
Reports	
News	• Email: neldredge@math.cornell.edu
Midterm course	• Office hours: Mondays 10:00 AM - 12:00 Noon. I am also happy to meet at other
evaluation	times; please send an email to make an appointment.
Syllabus	o Onice: 595 Malott Hall
Syllabus	• Teaching Assistant: Mathav Murugan
Course discussion	
forum	• Email: mkm233@cornell.edu
Homework	• Office hours: Tuesdays 10:00 AM - 12:00 Noon
assignments	• Office: 657 Knodes Hall
Supplementary notes	Course content
Project info	• Markov chains in discrete time: single and multi-step transition probabilities, stopping
Brownian motion applets	times, transience and recurrence, irreducibility, periodicity, stationary distributions and convergence. Infinite state spaces, e.g. random walk.
Last year's exams	• Martingales in discrete time. Stopping times, optional stopping theorems and
Textbook errata	applications. Harmonic functions of Markov chains.
Final Exam	• Poisson process: exponential and Poisson distributions, compound Poisson process and
Topic 11	wald's equations, superposition.
Topic 12	distributions and convergence. Queueing chains
Topic 13	• Brownian motion: normal distributions, Markov property, sample path properties,
Topic 14	Donsker invariance principle.
Topic 15	• Applications to mathematical finance: the Black-Scholes model and option pricing.
Topic 16	• Other topics according to available time and student interest.
Topic 17	Prerequisite: An introductory probability course such as MATH 4710 BTRY 4080 ORIF 360
Topic 18	ECON 3190. If unsure about your preparation, please discuss it with me. General proficience
Topic 19	in single-variable calculus, basic multi-variable calculus, and linear algebra will also be
Topic 20	needed.
Topic 21	Taythaak
Topic 22	
Topic 23	R. Durrett, <i>Essentials of Stochastic Processes</i> . A copy is on reserve at the Mathematics Libra (4th floor Molett Holl)
Topic 24	
10010 2.4	Various other common textbooks are also on reserve. The list of reserve books can be seen here (if the library has fixed it correctly)
Settings 🗉	Homework
Page module	
administration	witten nonework will be due weekly in class. Usually this will be on wednesdays, but there will be some variations; for instance, the first homework will be due Friday, January 27

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Course administration

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instead. If you cannot attend class, you may leave your homework under my office door (593 Malott) any time before class begins.

2 times during the semester, you may have an automatic 48-hour extension for the homework. This does not require prior approval, just hand it in at the next class with a note saying you are using an extension. If circumstances arise where this may not be sufficient, please let me know as soon as possible. Otherwise, late homework will not be accepted without prior approval.

**Homework grading policy**: Homework will be graded partly on completeness (30%) and partly on correctness (70%).

- For completeness, you must show a substantial effort to work *every* problem. If you are totally stuck, try talking to me, Mathav, a classmate, or posting on the discussion forum (you have a better chance of doing this if you start early!). If all else fails, explain why you are stuck: what you tried, why it didn't work, why the techniques you know do not apply to this problem. This will demonstrate that you have given serious thought to the problem. The completeness score may be *nonlinear* in the number of problems attempted; missing even a few problems could result in large point deductions, so be sure to attempt *every* problem.
- For correctness, selected problems will be read carefully and comments given. Elsewhere on the course web site, I will post a more detailed explanation of what we expect from a good homework solution.

**Group work policy:** The purpose of homework in this class is to gain experience in working with the ideas studied in class. Homework is usually where the most learning takes place. You are *encouraged* to work in groups and *discuss* the homework problems with classmates, but what you write for submission must be your own work, based on your own understanding of the problem and solution.

# Project

A research/writing project will be completed near the end of the semester. Further details will follow.

- Draft: Due Monday, April 23 in class.
- Final version: Due Friday, May 11, at 4 PM.

#### Exams

Two prelims, one cumulative final. The exams will be take-home. Last year's exams are posted on the course website, to give you an idea of the format. They will not necessarily be representative of the content or difficulty of this year's exams.

- Prelim 1: Given out Wednesday, Feb. 29 in class, due Saturday, Mar. 3 at 4:00 PM
- Prelim 2: Given out Wednesday, April 11 in class, due Saturday, April 14 at 4:00 PM
- Final: Given out Tuesday, May 8, due Tuesday, May 15 at noon.

Hopefully the take-home exam format should minimize exam conflicts. However, if you discover a conflict that will prevent you from completing the exams during these times, please let me know *immediately*.

## Grading

- Homework: 23%. All homeworks will count equally, none are dropped.
- Project: 7%
- Prelim 1: 20%
- Prelim 2: 20%
- Final: 30%. The final exam is cumulative.

The course is not graded on a curve *per se*. At the end of the course, when all coursework has been graded, I will compute total scores based on the above weightings. I will then assign letter grades to score ranges based on the overall score distribution in the course, using my professional judgement rather than any fixed formula. Historical grade distributions for mathematics courses may be used as a guide but I may deviate if I see reason to do so. I feel this gives the most appropriate outcomes.

I am always happy to discuss your progress in the course with you. However, because of the system described above, I probably cannot accurately predict your letter grade based on your

work partway through the course. I apologize for the inconvenience of this.

**Graduate students:** If you are taking the course for credit, you will need to complete all the regular coursework (homework, exams and project), and will be assigned a grade like any other student. If you are taking the course S/U, you still need to do the coursework; I will compute a letter grade as usual and then assign you an S if the letter grade is at least C-. If you are not interested in doing the coursework, you are welcome to audit the course instead.

### Students with disabilities

The Cornell disability policy is as follows. If you have a disability-related need for reasonable academic adjustments in this course, provide me with an accommodation letter from Student Disability Services. Students are expected to give two weeks notice of the need for accommodations. If you need immediate accommodations, please arrange to meet with me within the first two class meetings.

# Academic integrity

I, your classmates, and the entire Cornell community expect you to complete this course based on your own work, to clearly attribute any use of the work of others, to abide by relevant rules for coursework and exams, and to let me know about any situation (involving yourself or others) when this is not the case. The Cornell Academic Integrity Policy spells out the nasty details of what happens otherwise, and I am committed to enforcing this policy should it become necessary.

neldredge@math.cornell.edu

Last modified: Monday, 23 January 2012, 11:19 AM

You are logged in as Nate Eldredge (Logout)

Moodle Docs for this page

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