198:206: Introduction to Discrete Structures II
Spring 2016
Sections 05 & 06

Lectures: Tu Fr 12:00pm - 1:20pm, LSH-A143
Recitations Tu / Fr 1:55pm - 2:50pm, BRR-4085 (Sec 05) TIL-253 (Sec 06)

1 Instructor

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2 Teaching Assistants

Sections 05 & 06
TBA
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3 Course Description

cs206 is an introductory probability course. We will learn about combinatorics - different ways of counting events, discrete event probabilities, and, time-permitting, probabilities on continuous spaces.

Prerequisites: 198:205 and 640:152.

3.1 Topics

- Basic Ingredients (random experiment, sample space, events, probability measure).

- Conditional Probability, Bayes Theorem, Independence.

- Combinatorics and Counting.

- Recurrences, Generating Fns, and Applications.

- Random Variables.

- Bernoulli Trials.

- Expectation, Variance.

- Applications of Probability and Combinatorics.

4 Textbooks etc.

We will use the Ross textbook as our primary reading. Additional reading material will be from Rosen, Ch.6 and Ch. 7, and some other notes may be distributed in the class. We will also use the iClicker for in-class quizzes:

- Required: A First Course in Probability – Sheldon Ross Prentice Hall, 9th ed., 2014. `http://www.pearsonhighered.com/educator/product/First-Course-in-Probability-A-9E/9780321794772.page`.

- Required: Discrete Mathematics and its Applications – Kenneth A. Rosen McGraw Hill, 7th ed., 2012 (Ch. 6-7), `http://www.mhhe.com/math/advmath/rosenindex.mhtml`.

- Required: iClicker 2. `https://www1.iclicker.com/products/iclicker-2`.

Both texts are frequently updated and I encourage you to use the latest editions, as listed above. If you already have a slightly older edition, I will try to highlight the differences (if any exist) so that you do not have to purchase yet another expensive textbook.

iClicker will be used regularly in lectures, so you need to make sure you have one. You must use the actual device (not the smartphone app), as the app option, unfortunately, does not work reliably in the classrooms where I tested it.

5 Course Policies and Procedures

5.1 Lectures

Lectures are meant to assist you with *reviewing and clarifying* the course material you have already read about from the textbooks and lecture notes. What this means is that you *must review the material ahead of the lecture* by reading the textbook and the lecture notes.

All lecture notes are already posted under Lectures on the course Sakai site. These are the notes from the previous incarnations of this course and are bound to change and be updated. However, they will not change significantly.

I also suggest that you bring either printed or electronic copies of the notes with you to the lectures. Many times we will be referring to concepts from a few lectures back or a few slides back, so it is very useful to have those handy.

5.2 Quizzes

Quizzes will be administered using the iClicker device. Typically, there will be 5-10 questions (mostly multiple choice) in each lecture and you will use the iClicker to log in your answers. Each correct answer will count for one (1) point. If you participate in more than 75% of the polls you will also earn one (1) participation point. The maximum number of points in each session is ten (10). Those points will then add up over all lectures (sessions) where iClicker was used to form the total Quiz points (10% of overall grade). There will be no make-up option for missed quizzes.

Make sure you iClicker devices are registered in your name. To register your device, log into your Sakai account and go to the "i>clicker" section. There, you will find a place to register the device using its unique ID. Please be aware that an iClicker device can be used only by one individual student. If you borrowed the device from someone, you will need to re-register it in your own name (and deregister it from the original owener's name).

5.3 Homework

Homework will be assigned approx. every week to two weeks. You should work on the assignment independently. After all, homework is there to help you learn and understand the topics we cover and prepare for the tests. At the time homework is assigned you will be given the due date. All homework is to be turned in by 11:59pm on the due date. Late homework is accepted with the following penalty:

Hours Late	Penalty
(0,24]	-20%
(24,48]	-50%
(48, ∞)	no credit

For example, if you turned in your assignment at 2:10am the day after the due date and you solved all problems correctly, you will get a score of 80 instead of 100. See Grading Policy for further details.

All Sakai submissions are time-stamped, so there shall be no ambiguity whether and when you submitted your assignment. Sakai will also always confirm your submission. If you did not get a confirmation, assume you did *not* submit successfully. You may submit multiple times and I will always only consider the most recent submission.

5.3.1 Homework Format - Electronic Submission

All homework assignments are to be submitted through Sakai in electronic form. Specifically, all submissions have to be in PDF. No Word, plain text, JPEG, LaTeX, PNG, TIFF, etc. This does not mean that you have to typeset/write your submissions in a word processor. You are free to handwrite your solutions *clearly and legibly*, then scan them, convert to PDF and submit. However, you must make sure that the electronic document is:

1. Fully legible.

2. Of reasonable file size ($< 10MB$).

Scanning in grayscale is typically the preferred format. There is no need to scan in color unless the color information is somehow essential to our understanding of your solution.

Nowadays, there are many mobile phone apps that do a great job of scanning documents and converting them to PDF. For instance, I've been using Scanner Pro by Readdle for IOS for a number of years now. It is a paid app, but (in my opinion) it is well worth the cost. Some other options are Evernote's Scannable or Microsoft's OneNote. On Android, you can use Google's Drive app, see `https://support.google.com/drive/answer/3145835`.

Of course, you are also welcome to write solutions using a word processor. I encourage you to use the free LaTeXtypesetting format. It is a de facto standard for CS/engineering publications and the produced documents are light years ahead of what e.g., MS Word can generate, particularly when it comes to mathematical formuae and algorithms. We will offer a free LaTeXtutorial for those interested in learning how to use LaTeX. Sorry, no browny points for submitting your solutions in LaTeXbut the fact that the documents will be absolutely legible may indirectly resolve any possible ambiguities in your favor.

5.4 Grading Criteria

You final grade will be based on how well you perform on homework assignments, midterm, and final exams. Each performance item will weigh according to the table below.

20%	Homework
20%	Midterm I
20%	Midterm II
30%	Final
10%	Quizzes

5.5 Grading scale

Each time you turn in an assignment (or a test) you will be given a numeric score S between 0 (worst) and 100 (best). **You must accumulate at least** 50 **points to get a passing score.** If your passing score if above 50, this score will then be converted to a normalized score:

$$S_n = \frac{3}{2}\frac{S - E[S]}{StdDev[S]} + 4.$$

truncated to the range [0,7]. The score S of less than 50 points will result in the normalized score $S_n = 0$. This, for instance, means that if you score 70 points on the final, the class average is 60 and the standard deviation is 20, your normalized score will be 4.75. This formula can be adjusted to guarantee the best performance possible.

The normalized score will *roughly* correspond to the letter grades in the table below. Hence, in the example above 4.5 would correspond to letter grade B.

A	6.0 - 7.0
B+	5.0 - 6.0
B	4.0 - 5.0
C+	3.0 - 4.0
C	2.0 - 3.0
D	1.0 - 2.0
F	0.0 - 1.0

Final course grade will be assigned based on the weighted average score of all assignments and tests:

$$FS_n = 0.2[S_n(HW1) + ...S_n(HWN)]/N + 0.2S_n(Mid - I) + 0.2S_n(Mid - II) + 0.3S_n(Fnl) + 0.1S_n(Quiz).$$

After computing the final score I may adjust it based on my overall impression of your performance. Your final course letter grade will be computed from the final numeric score FS_n and the table above.

6 Sakai

We will be using `http://sakai.rutgers.edu` online course management for posting announcements, homework assignments, grades, and pretty much all communication during this semester. Familiarize yourself with the site if you have not used it before.

7 Communicating With Me

Best way to reach me is via email. However, it is essential that any CS206 related email sent to me begin with subject line "cs206". For instance, "cs206: lecture next Tuesday". Unless you use this subject line prefix it is very likely that I may miss your email or reply to it very late.