

**MATH 107**                      **day time**                      **room**                      **term, year**

**Instructor:** name

**Office:** office number, building

**Email:** email@uoregon.edu

(Please include *Math 107* and your discussion leader's name in the subject line when emailing me, e.g. *Math 107-Michelle*.)

**Office Hours:**

day: time, day: time, day: time

or by appointment (email me)

**Discussions on Thursdays:**

time	CRN	room, building	name1	email1@uoregon.edu
time	CRN	room, building	name2	email2@uoregon.edu
time	CRN	room, building	name3	email3@uoregon.edu
time	CRN	room, building	name4	email4@uoregon.edu
time	CRN	room, building	name5	email5@uoregon.edu

**Anonymous Feedback:** All students are encouraged to give me anonymous feedback about the course or my teaching during the term. Go to *www.gmail.com*, log in with the user name *anonymousinstructorfeedback* , use the password *isn'tmathfun?* and send me a message containing any constructive feedback you would like to give.

**Prerequisites:** The prerequisite for this course is successful completion of Math 95 or an acceptable score on the placement test.

**Calculator:** Calculators are allowed, but not required, for tests and homework.

**Textbook:** *Mathematics: A Mathematical View of Our World* by Parks, Musser, et. al., or *University Mathematics III, Math 107* . Note that there is a copy of the book in the Knight Library and in the Mathematics Library (218 Fenton Hall).

**Attendance:** Attendance is crucial to your success, since the most important material, concepts, vocabulary, and examples, will be emphasized in class.

**Academic Honesty** is taken very seriously. The integrity of your degree depends on it. All instances of academic dishonesty will be reported to the Office of the Dean of Students.

- On homework, you are allowed (and encouraged) to work with other students, but the work you submit must be your own. In other words, figure out problems together, but write solutions separately. For those who get help from tutors, if you are shown how to do a problem, you should still write a solution that is your own. Getting solutions from online sources is also considered cheating.
- On tests, any cheating, in particular copying from others, or allowing others to copy you, will result in failure of the course.

**Course Goals:** The course is a survey of five topics that require mathematics and are relevant to our lives.

The first topic is Voting Systems. By the end, the students should be able to:

- Know how to determine the winner of an election using a variety of different voting methods, including the Plurality method, the Borda Count method, the Plurality with Elimination method, and the Pairwise Comparison method
- Determine which of the fairness criteria a voting method satisfies
- Determine the outcome of a weighted voting system
- Determine if a coalition is a winning or losing coalition
- Compute the Banzhaf power index of a weighted voting system

The second topic is Fair Division. By the end, the students should be able to:

- Fairly divide a quantity using divide-and-choose methods for two, three, or more players
- Fairly divide a collection of objects using the method of sealed bids or the method of points
- Determine whether or not a division is fair or envy-free

The third topic is Apportionment. By the end, the students should be able to:

- Apportion seats using Hamilton's, Lowndes', Jefferson's, and Webster's methods
- Determine a modified quota and modified divisor, given the size of the population and the number of seats to be apportioned.
- Determine whether or not a particular apportionment falls prey to the New State paradox, the Population paradox, or the Alabama paradox
- Determine whether or not a particular apportionment satisfies the Quota rule.

The fourth topic is Networks. By the end, the students should be able to:

- Use Eulers theorem to determine if a give graph contains an Euler path or an Euler circuit
- Find the minimal spanning trees of a given graph
- Find approximate solutions to the travelling merchant problem

The fifth topic is Modular Arithmetic. By the end, the students should be able to:

- Find the remained when one whole number is divided by another whole number
- Use first principles to determine what is the residue of whole number modulo another whole number
- Use the properties of congruences to determine what is the residue of whole number modulo another whole number

**Canvas:** You can use our Canvas website to see syllabus, schedule, homework assignments, your grades and more. To access our class canvas site go to <http://canvas.uoregon.edu/>

**Accessibility:** The University of Oregon is working to create inclusive learning environments. Please notify me as soon as possible if there are aspects of the instruction or design of this course that result in disability-related barriers to our participation. You may also wish to contact Disability Services in 164 Oregon Hall at 346-1155 or [disabsrv@uoregon.edu](mailto:disabsrv@uoregon.edu)

**Homework:** Homework will be collected weekly in your discussion section. Homework questions should be addressed during your TA's or instructor's office hours. Not all of the assigned problems will be graded. Each week, several problems will be chosen to be graded for accuracy. *You must show your work to get credit.* Marks may be docked if your homework is not neat.

**Quizzes:** Thursday discussion classes will consist of a 20 minute quiz, and then a discussion about the solutions to the quiz. The quizzes are graded for effort only, not accuracy; in other words, if you show up to every discussion section and make a genuine effort on every quiz, you will receive full marks.

### **Grading:**

**Quizzes – 10%** (every Thursday in your discussion section, graded for effort only)

**Homework – 15%** (due every Thursday in your discussion section, the lowest HW score will be dropped)

**Exam #1 – 25%** (Monday, week 5, in class)

**Exam #2 – 25%** (Monday, week 8, in class)

**Exam #3 – 25%** (Monday, week 11, time, location)

**NOTE (on all homework, quizzes, and exams):** No late work will be accepted. Make-up quizzes or exams will not be offered. If there are documented, extenuating circumstances, the work will be excused.

**Grading Breakdown:** A: 90% or better, B: 80% -89%, C: 70%-79%, D: 60%-69%, F: below 60%. Plus grades will be awarded when the last digit is 8 or higher (98%-100% is an A+). Minus grades will be given if the last digit is either a 0 or 1. Your final percentage will be rounded to the nearest whole number. You must get at least 70% to receive a pass (P) grade (if you are taking this course with the Pass/No Pass option).

## Math 107 Spring 2014 Tentative Class Schedule:

Week	Sections Covered	Discussion
1	3.1	Quiz #1
2	3.2, 3.3	Quiz #2
3	4.1, 4.2	Quiz #3
4	4.3, review	Quiz #4
5	Exam #1 (chapters 3 & 4), 5.1	Quiz #5
6	5.2	Quiz #6
7	5.3, 6.1	Quiz #8
8	Exam #2 (chapter 5), 6.2	Quiz #8
9	6.3, 1.2	Quiz #9
10	1.2, review	Quiz #10
11	Exam #3 (chapter 6 and 1.2)	

### Important Dates:

- Monday of the 2nd week – last day to drop without a ‘W’
- Wednesday of the 2nd week – last day to add a class
- Sunday at the end of the 7th week – last day to drop the course or change your grading option to P/N.
- Thursday, November 26th and Friday, November 27th are holiday in the Fall (week 9); Monday January 18th is a holiday in the Winter (week 3); Monday May 23rd is a holiday in the Spring (week 9)

### Tips for Success:

- attend every class
- read the section of the textbook before we discuss the material in class. Even reading the first page or two helps
- begin assignments as soon as they are posted
- spend time on this course every day: reading ahead, reviewing notes or quizzes, completing assignments, etc.

**Extra Help:** If you think you’ll need extra help, get a tutor right away. Check with Teaching and Learning Center (room 68 PLC). Teaching and Learning Center also maintains a free drop-in lab with tutors starting from week 2 (room 72 PLC, Mon-Fri: 9-4.) You can read about their services on their site <http://tlc.uoregon.edu/> The math department offers free tutoring in the math library, Fenton 218.

**Expectations** I expect you to:

- submit work on time
- arrive on time, and to minimize the disturbance if you arrive late
- ask questions
- provide feedback about the course (anonymously or otherwise)
- participate in class
- be respectful and courteous towards you classmates (eg., chatting during class distracts other students, and will not be tolerated)
- come to class prepared (eg., reviewed content from last class, attempted the homework, etc)
- spend approximately two hours outside of class on homework, review, etc for every one hour spent in class
- take responsibility for any course content covered when you miss a class
- attend office hours or make an appointment with me if you would like help

You can expect me to:

- arrive on time to class
- be enthusiastic about the material and about mathematics in general
- be available to provide help, support, and advice
- reply to email in less than 24 hours (typically *much less* than 24 hours)
- consider and respond to all feedback about the course
- return work no more than one week after it has been submitted
- make adjustments to the classroom environment through-out the term according to the needs of the class

**Regarding Sexual Violence:** The UO is committed to providing an environment **free** of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence and gender-based stalking. If you (or someone you know) has experienced or experiences gender-based violence (intimate partner violence, attempted or completed sexual assault, harassment, coercion, stalking, etc.), know that you are **not alone**. UO has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more.

Please be aware that all UO employees are required reporters. This means that if you tell me about a situation, I may have to report the information to my supervisor or the Office of Affirmative Action and Equal Opportunity. Although I have to report the situation, you will still have options about how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

If you wish to speak to someone confidentially, you can call 541-346-SAFE, UO's 24- hour hotline, to be connected to a confidential counselor to discuss your options. You can also visit the SAFE website at [safe.uoregon.edu](http://safe.uoregon.edu).

**Notes for the Instructor:** (mostly borrowed from Mike Price, with many thanks)

- The course coordinator is David C Steinberg: [dcstein@uoregon.edu](mailto:dcstein@uoregon.edu)
- There are a variety of syllabi online (<http://math.uoregon.edu/syllabi/>), which are definitely worth checking out
- If you are running low on time, you might consider skipping the “last diminisher method” (section 4.1) and/or the “adjusted winner method” (section 4.2).
- The course is extremely modular, more so even than Math 105 and 106. There’s no particular reason you can’t give three, equally-weighted exams without a cumulative final in this course.
- I provide students with a formula sheet for their exams. I am not so concerned with them memorizing the names of voting or apportionment methods, I would like to see them applied and interpreted successfully. (I do **not** recommend allowing them to bring cheat sheets, as they often just bring solutions to homework problems with the hope of generalizing for the exam, which exhibits no learning.)
- Consider having homework due twice per week, it works out to almost exactly one section per turn-in that way.