

# Mat 118 - Mathematical Thinking

## Spring 2014

Welcome to Mat 118! The aim of the course is to develop your quantitative thinking and problem solving abilities through a selection of mathematical applications to real-life problems: the mathematics behind elections, management science and probability.

Click on the top for more information:

The [Info](#) section contains times and locations of the lectures and recitations, information about the textbook, etc.

You will find information about office hours and ways to contact your instructors in the [Instructors](#) section.

The week-by-week progress of the lectures and the weekly homework assignments are posted in the [Schedule & Homework](#) section.

Information about the exams is contained in the [Exams](#) section.

# Info

## Times and places:

Lectures MWF 10:00am-10:53am Harriman Hall 137 Lorenzo Foscolo  
R01 W 5:30pm- 6:23pm Physics P112 Michael Albanese  
R02 M 1:00pm- 1:53pm Physics P112 Michael Albanese  
R03 Th 1:00pm- 1:53pm Physics P112 Zheng Zhang

Important dates are on the university [Spring 2014 academic calendar](#).

## Textbook:

*Excursions in Modern Mathematics*, by P. Tannenbaum, 8th edition, Pearson.

## Prerequisite:

C or better in MAP 103 or level 2+ or higher on the mathematics placement examination. (Prerequisite must be met within one year of beginning this course.)

## Lectures, recitations and office hours:

You are expected to attend both lectures and recitation every week. Lectures give some basic understanding of the topics covered in the course. Recitations build your problem-solving skills. They are very important because one learns mathematics only by doing it. The time and location of lectures and recitations is above. Make sure you know your recitation section number; you must be enrolled in the recitation you attend.

The lecturer and the recitation instructors hold office hours every week. The times and locations are on the [Instructors](#) page, as well as the electronic addresses of all the instructors. You are encouraged to see your lecturer or recitation instructor to discuss homework and other questions.

### Homework:

Homework is assigned weekly. It is due at the meeting of your recitation section the following week and must be handed in to your recitation instructor. No late homework will be accepted.

### Grading policy:

There will be two midterm exams worth 20% of the final grade each, a final exam (40%) and weekly homework (20%).

### If you need math help:

Your recitation instructor and lecturer are happy to help. Come to our office hours with questions on homework and lectures. Additional help is available at the Math Learning Center.

### DSS advisory:

If you have a physical, psychiatric, medical, or learning disability that could adversely affect your ability to carry out assigned course work, we urge you to contact the Disabled Student Services office (DSS), Educational Communications Center (ECC) Building, room 128, (631) 632-6748. DSS will review your situation and determine, with you, what accommodations are necessary and appropriate. All information and documentation regarding disabilities will be treated as strictly confidential.

Students for whom special evacuation procedures might be necessary in the event of an emergency are encouraged to discuss their needs with both the instructor and with DSS. Important information regarding these issues can also be found at the following web site: <http://ws.cc.stonybrook.edu/ehs/fire/disabilities.shtml>

### Academic Integrity:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology and Management, Nursing, Social Welfare,

Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at: <http://www.stonybrook.edu/uaa/academicjudiciary>

# Instructors

## Lorenzo Foscolo

Office hours: MW 12noon-1pm in Math 2-121, F 12noon-1pm in MLC

Room 2-121, Math Tower

Tel.: (631)-632-2807

E-mail: [lorenzo.foscolo@stonybrook.edu](mailto:lorenzo.foscolo@stonybrook.edu)

## Michael Albanese

Office hours: Tue 4-5 in Math S-240G, Thu 4-6 in MLC

Room S-240G, Math Tower

E-mail: [michael.albanese@stonybrook.edu](mailto:michael.albanese@stonybrook.edu)

## Zheng Zhang

Office hours: M 11.30-12.30 in Math 2-116

Room 2-116, Math Tower

E-mail: [zzhang@math.sunysb.edu](mailto:zzhang@math.sunysb.edu)

# Schedule & Homework

**Week 1**, 27 Jan – 2 Feb

Reading: 1.1,1.2,1.3,1.4,1.5

Homework: Chapter 1, Exercises 2,7,14,17,24,27,34,44

**Week 2**, 3 – 9 Feb

Reading: 1.6,2.1,2.2

Homework: Ch. 1 exercises 54,70 + Ch. 2 exercises 1,18,24,26,30,36

**Week 3**, 10-16 Feb

Reading: 2.3,2.4,3.1

Homework: Ch. 2 exercises 44,56 + Ch. 3 exercises 2,8,15,16,33,34

**Week 4**, 17-23 Feb

Reading: 3.2,3.3,3.4,3.5,3.6,4.1

Homework: Ch.1 ex. 51 + Ch.2 ex. 29 + Ch.3 ex. 11,43,44,54,55 + Ch.4 ex. 6

**Week 5**, 24 Feb - 2 Mar

Reading: 4.2,4.3,4.4,4.5,4.6 + Midterm Exam I

Bonus Problem 1: This optional problem sheet has been sent out by email. It will give you up to 10 bonus points to be added to your final score at the end of the semester. If you are interested, you should submit your work by Monday March 10 at the end of the lecture.

**Week 6**, 3 – 9 Mar

Reading: 5.1,5.2,5.3,5.4

Homework: 2,6,11,25,30,35,45,51

**Week 7, 10 – 16 Mar**

Reading: 6.1,6.2,6.3,6.4,6.5

Homework: 2,10,16,18,25,31,37,51

**Week 8, 24 – 30 Mar**

Reading: 7.1,7.2,7.3

Homework: 3,6,29,31,33,36,37,40

**Week 9, 31 Mar - 5 Apr**

Reading: 8.2

Homework: Exercise 54 from Chapter 5 + Exercises 42 and 55(a) from Chapter 6 + Exercise 41 from Chapter 7 + Exercises 11,14,16,17 from Chapter 8

**Week 11, 14-20 Apr**

Reading: 14.1, 14.2, 14.3, 15.2

Homework: Exercises 6,7,36,53,54,55,56 from Chapter 14 + Exercise 31 from Chapter 15

Bonus problem 2: This optional bonus problem will give you up to 15 bonus points to be added to your final score at the end of the semester. If you are interested you should submit your work at your own recitation meeting in the week 5-11 May.

- 1) exercises in the notes about cryptography sent by e-mail (9 points)
- 2) exercise 69 in Chapter 5 (3 points)
- 3) exercise 69 in Chapter 6 (3 points)

**Week 12, 21-27 Apr**

Reading: 15.1, 15.3, 16.1, 16.2

Homework: Exercises 11,18,23,41,55 from Chapter 15 + Exercises 1,11,13 from Chapter 16

**Week 13, Apr 28 – May 4**

Reading: 16.3, 16.4, 16.5

Homework: Exercises 18,25,28,35,39,41,66,68 from Chapter 16

The lecture of Monday May 12 is cancelled.

For those who still don't have the 8th edition of the textbook:  
Exercises of Chapter 1, 2, 3, 4, 5, 6, 7

# Exams

## Midterm I: Friday 02/28, 10-10.53am, Harriman Hall 137

The exam is made of four parts:

Part I is about Chapter 1 and is worth 12 points. You will be asked to calculate the winner of an election under different methods.

Part II is about Chapter 2 and is worth 12 points. You will be asked to understand a concrete real-life situation as a weighted voting system and calculate its Banzhaf and/or Shapley-Shubik power distribution.

Part III is about Chapter 3 and is worth 12 points. You will be asked to find fair divisions of an assets using different methods, decide whether a certain division is fair, calculate how much a player values her share according to her value system.

Part IV is only worth 4 points and is a list of true/false questions about §4.1 and 4.2.

## Midterm II: Friday 04/11, 10-10.53am, Harriman Hall 137

The exam covers chapters 5, 6 and 7 and section 8.2 in the textbook. There will be three problems worth 10 points each and a list of 10 shorter questions worth one point each.

## Final exam: Monday 05/19, 8.30-10.45am, Harriman Hall 137

The final exam is cumulative and worth 80 points: 45 points will be on the last part of the course (Chapters 14, 15 and 16); the remaining 35 points are on Chapters 1, 2, 3, 4, 5, 6 and 7 (roughly 5 points per chapter).

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**Exam Rules:**

Calculators are not allowed.

All electronic devices (except watches) must be turned off. In particular, cell phones are not allowed. If you take your cellphone out for any reason (even just to check the time), you will be asked to turn in your exam paper and to leave the room.

Notes, textbooks, etc. are not allowed. Only the test paper and pens/pencil/eraser should be on your desk.

No consultations with others. Please raise your hand if you have any question.

No bathroom breaks are allowed. Please use the restroom before the test starts.

Please bring your college ID; it will be checked when you hand in your exam paper.