

CORE-UA.110: Great Ideas in Mathematics, Fall 2015 Syllabus

Instructor	Mutiara Sondjaja	Lecture	Tu Th 3:30pm-4:45pm
Email	sondjaja@nyu.edu	Classroom	19 University Pl, Room 102
Office	WWH 725	Course Page	via NYU Classess
Office hours	Tu 5-6pm, W 4-6pm, and by appointment	Questions	ask via Piazza

Teaching Assistants

<i>Name</i>	<i>Office Hours</i>	<i>Discussion Sections</i>
Kevin Blum ktb273@nyu.edu	W 9:30-11:30am WWH 705	Section 1: F 8am-9:15am, Loc TBA Section 2: F 9:30am-10:45am, Loc TBA
Weihong Xu wx378@nyu.edu	Th 12:30-2:30pm WWH 705	Section 3: F 11am-12:15pm, Loc TBA Section 4: F 12:30pm-1:45pm, Loc TBA

An Invitation to a Mathematical Exploration

A musician wakes from a terrible nightmare. In his dream he finds himself in a society where music education has been made mandatory. . . . Since musicians are known to set down their ideas in the form of sheet music, these curious black dots and lines must constitute the “language of music”. It is imperative that students become fluent in this language if they are to attain any degree of musical competence; indeed, it would be ludicrous to expect a child to sing a song or play an instrument without having a thorough grounding in music notation and theory. Playing and listening to music, let alone composing an original piece, are considered very advanced topics and are generally put off until college, and more often graduate school. . . .

Waking up in a cold sweat, the musician realizes, gratefully, that it was all just a crazy dream. Of course! he reassures himself, “No society would ever reduce such a beautiful and meaningful art form to something so mindless and trivial; no culture could be so cruel to its children as to deprive them of such a natural, satisfying means of human expression. How absurd!”

-Paul Lockhart, *A Mathematician's Lament*

There are two main goals in this course: (1) to learn about new kinds of mathematical ideas that most of us had not seen before and (2) to gain a new appreciation for mathematics. Just as we cannot gain a real appreciation for music or arts by simply listening to lectures about music or arts, we cannot truly appreciate mathematics by only listening to lectures about math. In this course, we will be doing mathematics. You are not expected to be “good at math” in a conventional sense, but you are asked to be curious and to be willing to get your hands dirty (with math!).

We will study a selection of mathematical topics such as number theory, notions of infinity, patterns in nature, geometry, graph theory, topology, and fractals and chaos.

Textbook

Edward Burger & Michael Starbird, *The Heart of Mathematics: An Invitation to Effective Thinking*, 4th ed.

Assessments

Quizzes & Lecture Participation	20%
Written Homework	15%
Journal Assignments	5%
Final Project	10%
Exams	50%

In-Class Work: Quizzes (15%) and Lecture Participation (5%)

- **Quizzes** will take place every Friday at the beginning of discussion section. Each quiz will have an individual component and a group component. The lowest quiz grade is dropped.
- **Lecture Participation** includes clicker points, worksheets, and participation during lectures. Bring your clicker to every lecture!

Written Homework (15%)

- Homeworks are due on **Fridays** at the start of discussion section. **Late and emailed homework** will not be accepted. The lowest two homeworks are dropped.

Journal Assignments (5%) and Final Project (10%)

- The journal assignments and the final project are opportunities to relate the mathematical ideas we learn in class to other topics. You will be given prompts for the journal assignments, but you are free to choose your own topic for the final project.
- The journal assignments are due on **Fridays** at the start of discussion section. The final project is due at 3:30pm on December 15, the last day of class.

Exams (50%)

Midterm 1	October 16 (in class)	Ch 2, 3
Midterm 2	November 19 (in class)	Ch 4, 6
Final Exam	December 17, 4pm-5:50pm (location TBA)	All

The lowest exam is dropped. The remaining two exams are weighed equally (25% each).

Tips for an enjoyable semester!

- **Get your hands dirty in class!** Work on problems in class. Participate when we solve problems together. Get to know your classmates and help each other (but write up your homework individually!).
- **Spend time** on all assignments. This is your opportunity to wrestle with and to internalize new ideas introduced in class.
- **Get help** early:
 - **Attend instructor's office hours.** Office hours schedule, course information, homework assignments, and grades will be posted in the **NYU Classes** page for our section
 - **Piazza:** Use the course Piazza page to post questions and to respond to classmates' questions.

Course policies

There will be no accomodation for missed homework, quizzes, and exams, except in the cases of illness and observance of religious holidays. In the case of observance of religious holidays, you must make arrangements to make up missed work **at least one week in advance**. In the case of illness, you must present a detailed letter from a physician/health care provider. Students with disabilities can make arrangements at the Moses Center.

Honor Code

We value integrity and do not tolerate academic dishonesty. You are expected to uphold academic integrity as specified by the university and the College of Arts and Sciences (<http://cas.nyu.edu/page/academicintegrity>).