

# Math 196.2

## Foundations of Mathematical Thinking

### Spring 2015

**Class meetings:** Tues/Thurs 2:55pm – 3:45pm, PPHAC 232

**Web Page:** <https://sites.google.com/a/moravian.edu/math-196-foundations-of-mathematics>

**Professor:** Kevin Hartshorn

**Office:** PPHAC 215

**Office hours:** Mon/Wed 2:30-3:30pm or Tue/Thu 8:30-9:30am

**Google Hangout/Chat/Mail:** [hartshornk@moravian.edu](mailto:hartshornk@moravian.edu)

### Course Overview

This course is meant to serve as a bridge between your mathematical experience in high school and the quantitative demands of college courses at Moravian. The goal in this class is to provide a review of the key mathematical topics from high school (using Khan Academy to identify topics that you need require particular review and support) as well as helping you develop tools to be successful in your college career. We will use open-ended team-based problems to help you develop persistence, creativity, and logic-based problem solving skills.

On completion of this course, you will receive 1/2-unit credit toward your college degree. Note that this will not count as mathematics credit: you will still need to complete your F2 (quantitative reasoning) requirement during your tenure at Moravian College.

### *Goals and Objectives*

- Develop a mastery of basic algebraic skills (as laid out via our Khan Academy mission)
- When presented with a problem, methodically experiment in order to develop testable conjectures in order to identify underlying patterns.
- Using appropriate mathematical tools (graphs, equations, etc.) to model and solve a given problem.
- Demonstrate positive problem-solving strategies, including creativity, logical thinking, and making connections to related problems.
- Demonstrate a professional work ethic, including both independent work and effective cooperation in team-based activities.

### Basic class structure

While this is the basic format for the class, it will change from day-to-day subject to the progress of the course:

- **Opening:** Quiz based on recent Khan activity (10-15 minutes)
- **Work in stations:**
  - *Station 1:* Continued work on Khan Academy

- *Station 2*: Review and assistance with Khan topics that are causing difficulty.
- *Station 3*: Open-ended problem to develop mathematical reasoning.
- **Final moments (and at home)**: Reflecting on course progress and plans for next session.

## Determining the grade

The grade will be determined by the three key components of the course:

- 35%** Khan Academy
- 35%** In-class quizzes
- 10%** Reflections on class work
- 25%** Average of 3 Exams (2 during the semester and one during finals week)

As a general rule, a final grade of 90%-100% will result in an A or A-, 80%-90% will result in a B (+/-), 70%-80% will result in a C (+/-), and 60%-70% will result in a D (+/-). Any score lower than 60% will result in a failing grade.

### *Khan Academy*

This course is designed to help you review and refresh core mathematical techniques needed to succeed in college. Most of these techniques are included in the *Algebra I* mission in the Khan Academy (<http://khanacademy.org>) on-line site. I will provide a set of assessments you must complete in a timely basis for your weekly Khan Academy grade.

For each activity, you will be given credit as follows:

- Complete activity with "practiced" status or better **before** the due date: 100%
- Complete activity with "practiced" status **after** the due date: 40%
- Complete activity with "level 1" status **after** the due date: 60%
- Complete activity with "level 2" status **after** the due date: 75%
- Complete activity with "mastery" status **at any time**: 100%

### *In-class work*

At the end of each class, you will be asked to complete a Google form assessing your work for the day. This is a chance for you to take stock of the things you learned or worked on during the day. Further, you will be asked to assess your own work, evaluating whether you feel that you made appropriate progress toward the goals of the class.

### *Exams*

There will be exams on these dates. Details will be provided in a separate document.

- Thursday, February 19
- Thursday, April 2
- Friday, May 8 at 8:30am

### **Bonus option for final exam**

If you complete 85% or more of the *Algebra I* mission, then you may choose to replace your final exam grade with your progress percent score from the *Algebra I* mission.

## **General expectations**

### *In-class expectations*

#### **Required materials for class**

I expect you to bring the following items to every class meeting:

- your laptop, fully charged,
- your iPad, fully charged. Your iPad must include the following apps:
  - Notability,
  - Google Drive,
  - Google Hangouts,
  - Google Docs,
  - Google Sheets,
  - a calculator (I recommend MyScript Calculator).
  - I strongly recommend a stylus for the iPad,
- paper,
- writing instrument (pen or pencil is fine).

#### **Absences**

Each class day is critical. Each missed class will result in a zero for both the quiz and the in-class grade for the day.

Your attendance is critical to practice the deep mathematical work necessary to succeed.

### *Out-of-class expectations*

#### **On-line communication**

Keep up with e-mail and announcements (using official Moravian e-mail account and Google site). Be sure that your iPad is configured to receive both e-mail and Google chat messages. You are expected to conduct yourself professionally when using e-mail and texts in an academic setting.

**When using e-mail:** Always include a short, helpful, subject line. Be sure to use complete sentences with proper grammar. Make sure that the point of the message is in your first paragraph. E-mails are considered professional correspondence: take the time to ensure your e-mail reflects positive writing habits.

**When texting:** Complete sentences are not required, but keep sarcasm and emoji to a minimum. Remember the purpose is communication: be sure the person receiving your texts understands your shorthand.

### **Keeping up with homework**

This class requires significant homework: it is expected that **you will spend at least 5 hours every week on homework for this class**. For best results, divide this time over the week: spend at least 30 minutes every day working on your Khan Academy work, and plan on one or two days where you spend an hour or more.

Constant practice is the only way to improve in this course.

### *Academic Honesty*

You are expected to adhere to Moravian College's code of academic honesty (available at <http://www.moravian.edu/studentlife/handbook/academic/academic2.html>). Specifically:

- Work on Khan Academy must be completed **by you**. Having a classmate or other person complete the Khan Academy exercises for you will result in penalties.
- All quizzes and tests are to be complete by you without the use of notes or other aids.
- All in-class work is group-based. You will be encouraged to work together on work in class.

### *Disability Support*

Students who wish to request accommodations in this class for a disability should contact Ms. Elaine Mara, Assistant Director of Academic & Disability Support, located on the lower level of Monocacy Hall (x1401). Accommodations cannot be provided until authorization is received from the office of Academic & Disability Support.

### **Final notes**

- This syllabus is subject to change. The latest version will be kept as a Google Doc available through the class web site.
- Your final grade is subject to the professional judgement of the professor of the course.
- If you have any questions or concerns, direct them initially to your professor (Kevin Hartshorn, [hartshornk@moravian.edu](mailto:hartshornk@moravian.edu)). If your concerns with the class that are not resolved by your professor, you can contact Dean Traupman-Carr ([traupman-carrc@moravian.edu](mailto:traupman-carrc@moravian.edu)).