



Course Number/Section and Title: MATH 1210-01: Nature of Mathematics

Semester and Year: Spring 2020

|                 |      |              |            |
|-----------------|------|--------------|------------|
| Course Meeting: | MWF  | 9:10-10:05am | Towers 241 |
|                 | Days | Time         | Location   |

|               |                    |                      |                                  |
|---------------|--------------------|----------------------|----------------------------------|
| Credit Hours: | 3                  | 3                    | 0                                |
|               | Total Credit Hours | Lecture Credit Hours | Lab Credit Hours (if applicable) |

Is this a Travel Course:  Yes  No

Instructor: Matthew McMullen

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Email Address

Towers 138

(614) 823-1279

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Office Location/Room #

Office Phone Number

Course webpage

MWF 11:30am-12:30pm

TR 8:50-9:50am

Set Office Hours and Tutoring Hours (also available by appointment).

### Course Catalog Description

This course explores the question "What is mathematics?" from a liberal arts perspective. Content modules (in topics such as number theory, set theory, and group theory) provide students a variety of opportunities to experience the power of abstraction, the use of logic and deduction, and connections between this science and other disciplines. Through investigations of mathematics as both an art and a tool, students develop creative and communicative skills. Most importantly, the course seeks to raise awareness of mathematics as a worthwhile human endeavor whose benefits can be used and appreciated.

*Prerequisite: C- or better in MATH 0900, math ACT 24 or better, or qualification through Otterbein's Mathematics Placement Exam.*

### Course Objectives

- To become actively engaged in mathematical thought.
- To have a better understanding and appreciation for mathematics.
- To see mathematics as a tool for understanding one's world.
- To improve mathematical problem solving, reasoning, and communication.

**Student Learning Outcomes:** Understand and use basic ideas of

- Number theory (prime numbers, patterns, rationals and reals, etc.).
- Set theory (basic operations, cardinality, etc.).
- Geometry (Pythagorean Theorem, Platonic solids, etc.).
- Elements of group theory.
- Other topics selected by the instructor in various branches of mathematics.

## Otterbein Mathematics Requirement Goals and Outcomes

**Goal 1:** To assist all students in understanding the value and purpose of the study of mathematics.

### Outcomes:

- Students engage in topics and activities that will help them to acquire mathematical habits of mind.
- Students gain awareness of the connections of mathematics to other disciplines, thereby enhancing their perceptions of the vitality and importance of mathematics in the modern world.

**Goal 2:** To help students progress in developing analytical, critical reasoning, and problem-solving skills.

### Outcomes:

- Students strengthen mathematical and/or quantitative abilities that will be useful in the study of other disciplines, required in the workplace, and/or needed for informed citizenship.
- Students gain experience formulating problems, considering multiple approaches, reasoning logically to conclusions, and interpreting results intelligently.

## Required Texts and/or Ancillary Materials

The textbook we will be using is *The Heart of Mathematics: An Invitation to Effective Thinking*, 4th edition, by Burger and Starbird.

## Attendance and Participation Policy

You are expected to be present at all classes. If you have a conflict with any test, you must see me in advance. No make-up tests will be given for unexcused absences.

## Assignments/Tests and expectations for out-of-class work

We will have group activities, eight reflection papers, two midterms, and a comprehensive final exam.

## Method for determining course grade

Group activities will count towards 10% of your final grade, reflection papers towards 25%, midterms towards 20% (each one), and the final towards 25%. It is anticipated (but subject to change) that the letter grade assignments will be made on the following scale: A 93%, A- 90%, B+ 87%, B 83%, B- 80%, C+ 77%, C 73%, C- 70%, D+ 67%, D 60%, F below 60%.

## Final Exam Date and Time

Wednesday, April 29, 8-10am

## Academic Honesty

All academic work should be your own. Academic dishonesty (plagiarism and cheating) may result in automatic failure of the assignment or the course itself, and you will be referred to the Academic Affairs Office for suspension or expulsion proceedings.

You are plagiarizing when you:

1. Copy material from a source without using quotation marks and proper citation.
2. Follow the movement of the source, substituting words and sentences but keeping its meaning, without citing it.
3. Lift phrases or terms from a source and embed them in your own prose without using quotation marks and proper citation.
4. Borrow ideas (that are not common knowledge) from a source without proper citation.
5. Turn in a paper wholly or partially written by someone else.

The complete statement on Plagiarism, Cheating and Dishonesty can be found in the [Campus Life Handbook](#), page 33, at the following web link: <http://www.otterbein.edu/public/CampusLife/HealthAndSafety/StudentConduct.aspx>.

## Learning Differences

If you have a documented learning difference please contact Kera McClain Manley, the Disability Services Coordinator, to arrange for whatever assistance you need. The Disability Services is located in Room #13 on the second floor of the Library in the Academic Support Center. You are welcome to consult with me privately to discuss your specific needs. For more information, contact Kera at [kmanley@otterbein.edu](mailto:kmanley@otterbein.edu), 614-823-1618 or visit the Disability Services at the following web link:

<http://www.otterbein.edu/public/Academics/AcademicAffairsDivision/AcademicSupportCenter/DisabilityServices.aspx>.

## Statement on Credit Hour Definition/Expectation for Student Work

For each credit hour of classroom or direct faculty instruction, students are expected to engage in two hours of out-of-class work (readings, homework, studying, project preparation, etc.). A three semester credit hour course requires six hours per week of out-of-class work.

### Schedule (tentative)

|             | Monday                                | Tuesday         | Wednesday                    | Thursday | Friday   |
|-------------|---------------------------------------|-----------------|------------------------------|----------|--|
|             | Jan. 13                               | Jan. 14         | Jan. 15                      | Jan. 16  | Jan. 17  |
| Week 1      | Classes start<br>What is mathematics? |                 | Chapter 1                    |          | Chapter 1  |
|             | Jan. 20                               | Jan. 21         | Jan. 22                      | Jan. 23  | Jan. 24  |
| Week 2      | MLK Day                               | Last day to add | 2.1<br>Reflection #1 due     |          | 2.2  |
|             | Jan. 27                               | Jan. 28         | Jan. 29                      | Jan. 30  | Jan. 31  |
| Week 3      | 4.3/2.3                               |                 | 2.3                          |          | 2.4<br>Reflection #2 due                           |
|             | Feb. 3                                | Feb. 4          | Feb. 5                       | Feb. 6   | Feb. 7   |
| Week 4      | Problems day                          |                 | 2.6/2.7                      |          | Movie day!   |
|             | Feb. 10                               | Feb. 11         | Feb. 12                      | Feb. 13  | Feb. 14  |
| Week 5      | 3.1                                   |                 | 3.2<br>Reflection #3 due     |          | Last drop day w/o "W"<br>3.2                       |
|             | Feb. 17                               | Feb. 18         | Feb. 19                      | Feb. 20  | Feb. 21  |
| Week 6      | 3.3                                   |                 | 3.3/3.4                      |          | 3.4  |
|             | Feb. 24                               | Feb. 25         | Feb. 26                      | Feb. 27  | Feb. 28  |
| Week 7      | Practice                              |                 | Review<br>Reflection #4 due  |          | Exam #1  |
|             | Mar. 2                                | Mar. 3          | Mar. 4                       | Mar. 5   | Mar. 6   |
| Week 8      | Spring Break                          |                 | Spring Break                 |          | Spring Break                                       |
|             | Mar. 9                                | Mar. 10         | Mar. 11                      | Mar. 12  | Mar. 13  |
| Week 9      | 4.1                                   |                 | 4.5                          |          | 4.6  |
|             | Mar. 16                               | Mar. 17         | Mar. 18                      | Mar. 19  | Mar. 20  |
| Week 10     | 4.6                                   |                 | 4.7<br>Reflection #5 due     |          | Practice   |
|             | Mar. 23                               | Mar. 24         | Mar. 25                      | Mar. 26  | Mar. 27  |
| Week 11     | Last day to drop<br>5.1               |                 | 5.2                          |          | Fun day!   |
|             | Mar. 30                               | Mar. 31         | Apr. 1                       | Apr. 2   | Apr. 3   |
| Week 12     | 6.1                                   |                 | 6.2<br>Reflection #6 due     |          | No class   |
|             | Apr. 6                                | Apr. 7          | Apr. 8                       | Apr. 9   | Apr. 10  |
| Week 13     | 6.3                                   |                 | Fun day!                     |          | Good Friday  |
|             | Apr. 13                               | Apr. 14         | Apr. 15                      | Apr. 16  | Apr. 17  |
| Week 14     | Review                                |                 | Exam #2<br>Reflection #7 due |          | Group theory                                       |
|             | Apr. 20                               | Apr. 21         | Apr. 22                      | Apr. 23  | Apr. 24  |
| Week 15     | Group theory                          |                 | Fun day!                     |          | Last day of classes<br>Review<br>Reflection #8 due |
|             | Apr. 27                               | Apr. 28         | Apr. 29                      | Apr. 30  | May 1  |
| Finals Week |                                       |                 | Final Exam<br>8-10am         |          |  |