

Syllabus for MT 111: Survey of Mathematics

Fall 2021

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Course Description

From the Academic Catalog:

“Students will be introduced to a diverse selection of topics from the three essential areas of mathematics: logic, numbers, and geometry. This will involve lectures about some foundational concepts of fields including propositional logic, set theory, functions, trigonometry, and calculus. This will be supplemented by reading and discussion about the history and motivation behind these disciplines. This course intends to focus on the human side of mathematics rather than necessarily fostering mathematical ability, and so little or no experience with mathematical calculation or derivation is required.”

More informally, this course is intended to help you grow in your appreciation for pure mathematics as a human discipline. This begins with understanding that mathematics has much more to offer us than just “solving real world problems.” My hope is to provide you with a gentle encounter with the side of mathematics more oriented to the human mind itself. Special attention has been given to those mathematical subjects that your peers pursuing “STEM” degrees (science, technology, engineering, and mathematics) will spend most of their time learning. Furthermore, the subjects have been chosen to provide a firm foundation for understanding most other mathematical topics, including useful applications. Subjects such as finance and statistics may be briefly discussed if there is sufficient interest and time.

Learning Objectives

Students participating in this course will tend towards growth in...

1. Articulating and evaluating their own assumptions, pre-conceptions, and biases before engaging with new mathematical material or expressing their point of view, and demonstrating an awareness of how context shapes discussions about mathematics and mathematical work itself (I.1.E, I.3.E).
2. Acknowledging the broad range and complexity of mathematical subjects and synthesizing these viewpoints into a larger and more holistic vision of mathematics (I.1.D).
3. Addressing mathematical topics with respect and appreciating mathematics for its contributions to society, culture, and personal development (I.1.C).

4. Integrating the history and philosophy of mathematics into their own Catholic and faith-based worldview, especially concerning human flourishing and the universal character of Divine Providence (I.2.B.u).

Learning Resources

1. Berlinghoff, William P., and Gouvêa Fernando Q. *Math Through the Ages: A Gentle History for Teachers and Others*. Dover Publications, Inc., 2019.
2. Bell, Eric T. *Men of Mathematics*. Simon and Schuster, 1986.

These books will be used to supplement the lecture material. They may be used as sources for your paper if you so desire.

You will be expected to produce a written copy, on paper, of the lecture notes I will write on the board. A conventional notebook is probably best suited for this purpose.

The use of any electronic devices during ordinary class time is prohibited unless otherwise indicated.

Assignments & Assessments

Midterm Exam	30%
Final Exam	30%
Homework	30%
Participation	10%

Exams will cover conceptual material regarding the subject of pure mathematics itself: its nature, content, purpose, etc. Three homework problems for each subject will become available after that subject's section is completed in the lectures. Each homework problem is worth one-sixth of the homework grade (that is, 5% of the total grade). In addition, you may write a short paper to supplement your homework grade. This paper is due by the end of the semester, and can be about anything related to the history, discipline, or philosophy of mathematics. Each full or nearly full page of this paper is worth, at most, the same amount as one homework problem.

In order to receive full credit for your homework, you must successfully complete six homework problems, write a six-page paper of reasonable quality, or some combination of these two deliverables. The total number of problems and pages must add up to six for full credit. I hope to cover at least three subjects, so there will eventually be nine or more problems available to choose from. Any problems or pages in addition to the six required will count towards extra credit up to a maximum of nine problems and pages total. This means that I will accept no more than three additional problems or pages for extra credit, or 15% of the total grade.

You may work together on these problems, look for guidance online, or come to me for help. On the other hand, you should not ignore your responsibility to independently understand the material well enough to spontaneously reproduce it. By "independently," I mean being able re-solve the same problems from your

homework with your own thoughts. By “spontaneously,” I mean doing this in new words, without relying on mere memorization. On your honor before God and men, you should not use other people simply to turn in assignments and “get through” the class. A good grade is meant to show that you have developed a corresponding virtue. Trying to receive merit without working towards real, individual excellence is both deception and theft. As far as this instructor is concerned, however, you are totally free to pursue intellectual excellence with the help of your friends and the tools God has made available to you. I only ask that if you worked together or used an online resource, please write down who you were with, what you used, and how you used it on your homework assignment.

“The Seminary is a school of human virtue, of growth in honesty, integrity, intellectual rigor, hard work, and tolerance... Growth in honesty can lead to humility and self-knowledge. It must also exclude all forms of false representation and cheating in academics.”

(Mount Angel Seminary Rule of Life 7-8)

The mid-term exam will be held on Wednesday, October 6th. The day of the final exam will be determined at some future date. All assignments are due at 11 a.m. on Monday, November 29th, though you may turn them in earlier. Late work will be accepted no later than 4 p.m. on the last day of class, which is currently scheduled for Friday, December 3rd.

Plagiarism Policy

All work submitted by students as their own work should indicate sources, published and unpublished, which were consulted and/or cited. It is the student’s responsibility to know the proper method of citation as well as how to acknowledge sources when not citing directly. Failure to acknowledge source material is plagiarism and will be dealt with accordingly with disciplinary measures ranging from failure of the assignment, the course, or dismissal from the Seminary. In such matters, the judgment of the appropriate Academic Dean and the President–Rector is final.

Accessibility Statement

Mount Angel Seminary is committed to providing accessibility to its services, programs and activities for students with disabilities, recognizing its responsibilities to ensure the rights of students with disabilities and to identify and maintain the standards that are required to provide its academic and formational programs. Mount Angel Seminary will strive to accommodate students with disabilities, unless the accommodation would pose an undue burden to the Seminary or compromise the mission or integrity of the program.

Students seeking accommodation(s) must:

- Provide a written statement to the Vice President of Administration requesting an accommodation that includes a description of the specific disability, how the student is limited and the expected duration of the limitation.
- Submit proper professional/medical verification of the condition(s) that necessitate the request to the Vice President of Administration.