Math 108 Section 02 Fall 2019

Mathematical Problem Solving

Course Information

Instructor	Lauren Williams, PhD	
Email	lwilliams@mercyhurst.edu	
Office Phone	(814) 824-2226	
Office	Old Main 404	
Office Hours	Mon	9:00 - 10:00
		12:30 - 1:30
	Tues	1:00 - 3:00
	Wed	12:30 - 1:30
	Thurs	8:00 - 9:00

Meeting Times	MWF 2:00 - 2:50
Location	Hirt 209
Website	https://integral-domain.org/lwilliams/math108/
Prerequisite(s)	None
Credits	3

Course Description

This course is intended to put the mathematical skills you already have to good use, and learn some new ones along the way. We'll see how mathematics can help us better understand the world around us. Most importantly, we'll understand how the strategies used to solve a specific problem can be expanded and used in a wide array of real life situations.

Objectives

On successful completion of the course, students will be able to:

- Interpret and formulate problems in the language of mathematics
- Display mastery of basic computational skills
- Solve problems using essential principles from geometry, algebra, probability, and statistics
- Demonstrate the use of mathematical reasoning by justifying and generalizing patterns and relationships
- Demonstrate the use of basic mathematical processes and algorithms

Required Material

There are no books or other materials that you will be required to purchase or bring to class. There may be assignments or study materials that require internet access.

Important Dates - Fall 2019

Aug	**21**	First day of class
	26	Last day to add/drop
Sep	**18**	**Exam 1**
	19	Mass of the Holy Spirit
Oct	**16**	**Exam 2**
	22	Advising Day
Nov	**6**	**Exam 3**
	8	Last day to declare pass/fail
	15	Last day to withdraw
Dec	**6**	**Exam 4**
	9	Reading Day

Course Units

Unit 1: Essentials of Mathematical Problem Solving

- Operations of mathematics: their symbols and properties
- Translating words into mathematics
- Essentials of logic
- Geometry: useful formulas and their applications
- Graph theory: an introduction to graphs, networks, and trees

Unit 2: Statistics, Counting, and Estimation

- Introduction to statistics: averages, percentages, and rates
- Counting principles: combinations and permutations
- Probability: random variables and expectation
- Interpreting statistical and mathematical statements

Unit 3: Numbers and Functions

- Number systems: historical development and modern use
- Exponential functions and growth
- Vectors and vector operations

Unit 4: Mathematics in Society

- Fair division algorithm: split bills, rent, assets, and group credit
- Detecting gerrymandering with mathematics
- Mathematics of social networks, media, and marketing
- Creating art with mathematics

Homework

You will be given brief homework assignments at the conclusion of most classes, approximately two per week. The problems in the homework are your opportunity to try out the techniques we'll see in class on your own, and maybe even come up with your own strategy.

Your lowest homework grade will be dropped when calculating your final grade, including a missed homework assignment. Late homework will not be accepted unless you arrange an extension in advance of the due date.

Exams

There will be four exams, each based on the homework and notes for a single unit of the course. Exams will be given on the dates below. There will not be a final exam, and we will not meet during finals week.

- Wednesday, September 18
- Wednesday, October 16
- Wednesday, November 6
- Friday, December 6

Exam Make Up Policy

Please let me know as soon as possible if you will not be able to attend class on the day of an exam. If you will be missing class the day of an exam for athletics or other planned reason, you are required to arrange a time to make up the exam before the exam is given in class. Make-ups after the class takes the exam will only be given in exceptional cases, with documentation from the Provost's Office or the Office of Academic Affairs.

GRADING

Your final grade in the course will be calculated as follows:

50%	Exams (4 exams)
50%	Homework, 1 lowest or missing homework score dropped

and converted to a letter grade using the scale below:

A	B+	B	C+	C	D+	D
90	87	80	77	70	67	60

Grades for homework assignments and exams will be posted on Blackboard throughout the semester.

OTHER COURSE POLICIES AND INFORMATION

- Handouts, slides, homework assignments, and other materials for this course will be posted on the course Blackboard site. If you are missing any materials, please check there.
- Attendance is not required, but is highly recommended. If you have to miss class, ask a classmate for notes and information you may have missed, and check Blackboard for any class materials you might need.
- I will attempt to return emails as quickly as possible (within 24 hours). However, it is better to ask complicated questions during class or in office hours. If you have a question about the homework, it is quite likely someone else has the same question, so you're doing the entire class a favor by asking.
- I do not have a "no electronics" policy, but please remember to mute all devices during lecture, and use devices in a way that does not distract other students in the class.
- You will be allowed to listen to music (with headphones) during exams, but please keep the volume at a level that does not distract other students. Plan a playlist in advance - your phone/player will need to be kept face down on the desk throughout the exam.
- While you are encouraged to work together on the homework, be sure you understand all material on your own before an exam. You are expected to submit your own work unless otherwise specified by the assignment.

ACADEMIC HONESTY

Students are required to uphold academic integrity throughout the course. In particular, plagiarism of any sort, unauthorized collaboration on exams, quizzes and other assignments, and other incidences of academic dishonesty will be handled according to the policies set forth in the Student Handbook.

COURSE EVALUATIONS

Near the end of the semester, you will be asked to complete an online course evaluation. The evaluation will be completed in class during the last two weeks of the semester using any laptop, tablet, or mobile device. The response tool allows you to note aspects of the course that helped you learn, as well as aspects that might be modified to help future students learn more effectively. You will receive an email letting you know when the evaluation window for our class is open. Please note that these course evaluations are anonymous and instructors do not see the results until after the grades for the course are submitted.

LEARNING DIFFERENCES

Mercyhurst University is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential. Students with disabilities requiring accommodations should consult with the Learning Differences Office to discuss eligibility for services or submit the online accommodation request to the Director of Equal Opportunity Programs (DEOP) at ada@mercyhurst.edu.

For students requiring accommodations for learning differences, it is the policy of Mercyhurst University that it is the student's responsibility to provide documentation of his/her disability to the DEOP.

Students are advised to request accommodations at the time of acceptance or prior to the start of the semester. Students may request accommodations at any time throughout the program, however accommodations are not retroactive.