

FALL SEMESTER 2021
MATH 267.002
Introduction to Abstract Mathematics

Topics: Sets, Mappings, Relations, Logic, Mathematical Induction, properties of the integers, Fundamental Theorem of Arithmetic, polynomials and elementary analytic concepts.

Learning Outcomes:

1. Students will understand the importance of definitions.
2. Students will be able to construct simple proofs of theorems and understand more complicated proofs.
3. Students will be able to use the language of logic, set theory, relations and functions and be able to calculate using modular arithmetic.

Prerequisites: Math 273 and Math 265.

Textbook: “Reading, Writing, and Proving: A Closer Look at Mathematics, 2nd Ed.” by Ulrich Daepf and Pamela Gorkin.

Instructor: Dr. Jay Zimmerman

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Office Hours: MoWe 4:00 – 4:50, TuTh 3:00 – 3:50 and by Appointment.

Exams:

There will be three in-class exams and a comprehensive Final Exam. The hour exams will be taken on **October 4, 2021, November 1, 2021** and **December 6, 2021**. **No make-up exams will be given.** If a strongly documented excuse is presented, then the Final Exam will be used to make up the excused exam.

Quizzes: Quizzes may be given at any time covering material on the homework. In class exercises will be counted as homework.

Grading:	3 Hour Exams	15% each
	Homework and Quizzes	15%
	Final Exam (12/20/2021 at 3:00)	40%

The corresponding letter grades are based on the final course score as follows:

<u>Range</u>	<u>Grade</u>	<u>Range</u>	<u>Grade</u>
93-100	A	77-79	C+
90-92	A-	70-76	C
87-89	B+	67-69	D+
83-86	B	60-66	D
80-82	B-	00-59	F

The instructor reserves the right to lower the grading scale, if he deems it necessary. For example, 88% can be made an A- at the instructor's discretion, but not a B.

Cheating: This course is conducted in accordance with the "[Student Academic Integrity Policy](#)". Cheating or plagiarism in any form is unacceptable. Use of internet sites such as Chegg or Course Hero is forbidden. A first instance will result in failure of the course. Students are encouraged to collaborate on homework problems and as long as the homework paper submitted is written by a single student without copying or looking at another student's work, this is not considered cheating.

Disabilities: This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Accessibility and Disability Services (ADS), 7720 York Road, <https://www.towson.edu/accessibility-disability-services/gettingstarted/>. Students who suspect that they have a disability but do not have documentation should contact ADS for advice on how to obtain appropriate evaluation. A memo from ADS authorizing your accommodation is needed before any accommodation can be made.

Diversity: In accordance with the Towson University Strategic Plan, the FCSM Diversity Action Plan, and the Department of Mathematics Diversity Action Plan, everyone participating in this course is expected to be respectful of each other without regard to race, class, linguistic background, religion, political beliefs, sex, gender identity or expression, sexual orientation, ethnicity, age, veteran's status, or physical ability. If you feel these expectations have not been met, please speak with Dr. Goode at egoode@towson.edu.

Withdrawal: The last day to withdrawal with a grade of 'W' is Monday, November 8, 2021.

Attendance Policy: Students are expected to attend all classes. The class sessions offer the opportunity for students to ask questions about the concepts

and to get help solving the problems. In class exercises can be given at any time and will NOT be made up, unless an excused absence is obtained ahead of time. Excused absences will not negatively affect your grade, but students remain responsible for all instructional activity conducted in each class.

I believe that a student who asks questions is worth her/his weight in gold. There is NO dumb question. So ask questions when you don't understand something.

Course Outline

<u>Chapters</u>	<u>Topics</u>	<u>weeks</u>
1	Problem Solving.	.5
2 - 5	Logic: Propositional logic; contrapositive and converse; proof techniques	2.0
6 – 9	Set Theory: Sets; operations on sets; indexed families; power sets; Cartesian product.	2.0
10 – 13	Relations: Relations; equivalence relations; order and completeness in the real numbers.	1.5
14 – 17	Functions: Functions; one to one and onto Functions; inverses; images and inverse images.	2.0
27 – 28	Modular Arithmetic.	1.5
18	Mathematical Induction.	1.0
19 – 20	Sequences: Definitions, convergence.	1.0
21 – 23	Cardinality: Equivalent sets; finite and infinite Sets; countable and uncountable sets.	1.0
<u>Tests</u>		<u>1.0</u>
TOTAL		14 Weeks