

MATH U174-02 – Elements of Discrete Mathematics
Fall 2018 Syllabus
MWF 12:30-1:20 PM
Hodge 256

Instructor:	Tim Rankin	Office Hours:	MWF 11:00 AM – 12:20 PM
Email:	trankin@uscupstate.edu		MW 1:30 PM – 2:00 PM
Office:	Hodge 238		TR 11:40 AM – 12:10 PM

Materials: The textbook for this course is *Discrete Mathematics: An Introduction to Mathematical Reasoning (Brief Edition)* by Susanna S. Epp. In addition, it is recommended that students have at least a scientific calculator.

Blackboard: The Blackboard page for this course will include homework assignments as well as a record of student grades. Blackboard can be accessed via the URL <http://blackboard.sc.edu>.

Attendance: Students are expected to come to each class session on time and to stay for the entire class. If you have to miss a class session, it is your responsibility to find out what was covered/announced in class and to learn any missed material.

Behavior: Every student must abide by the campus discipline code. Any student who behaves disruptively in class may be asked to leave. Phones should be kept silent and put away.

Academic honesty is absolutely required. Students may not give or receive help during examinations (including exchanging calculators), plagiarize, or otherwise cheat. Any student who violates the university policy on academic dishonesty will be penalized accordingly.

Grading:	Quizzes and Assignments:	25%	A:	90-100
	Tests:	50%	B/B+:	80-89
	Final Exam:	25%	C/C+:	70-79
			D/D+:	60-69
			F:	0-59

Testing: There will be three tests as well as a final exam. In addition, there will occasionally be a short in-class quiz based on recent material, and homework will sometimes be taken up and counted as half a quiz grade. At the end of the semester,

- your lowest quiz/assignment grade(s) will be dropped (either one quiz grade or two HW grades), and
- your lowest test grade will be replaced by your final exam grade (assuming it benefits you).

No make-up tests will be given. If you know you will need to miss a test or quiz due to extenuating circumstances, you may arrange with me to take it early. Any missed test or quiz will receive a grade of zero. (Emergencies will be handled on an individual basis.)

Final Exam: The comprehensive final exam will take place on **Monday, December 10** from **11:30 AM-2:30 PM** in the regular classroom.

Help: I am available to help during my office hours, or you may email me to schedule an appointment at another time. In addition, free math tutoring is available in Hodge 242 on weekdays starting at 8 AM.

Since the material in a mathematics course builds on previous material, it is important not to fall behind. Students are strongly encouraged to ask questions in class as they arise and to take advantage of the aforementioned options if help is needed.

Accommodations: USC-Upstate supports the ongoing development of an accessible university that embraces diversity through educational programming, services, resources, and facilities that are usable by all members of the campus community. In keeping with university policy, any student with a disability who requests academic accommodations should contact Disability Services at 503-5199 to arrange an appointment with a Disability Services staff member. Students are encouraged to seek an appointment as early in the semester as possible, as accommodations are not provided retroactively.

Students should visit www.uscupstate.edu/the-dome/enrolled-students/disability-services for more information.

Math 174 Topics (Tentative)

Chapter 1: Speaking Mathematically

- 1.1 Variables
- 1.2 The Language of Sets
- 1.3 The Language of Relations and Functions

Chapter 2: The Logic of Compound Statements

- 2.1 Logical Form and Logical Equivalence
- 2.2 Conditional Statements
- 2.3 Valid and Invalid Arguments

Chapter 3: The Logic of Quantified Statements

- 3.1 Predicates and Quantified Statements I
- 3.2 Predicates and Quantified Statements II
- 3.3 Statements with Multiple Quantifiers
- 3.4 Arguments with Quantified Statements

Chapter 4: Elementary Number Theory and Methods of Proof

- 4.1 Direct Proof and Counterexample I: Introduction
- 4.2 Direct Proof and Counterexample II: Rational Numbers
- 4.3 Direct Proof and Counterexample III: Divisibility
- 4.4 Direct Proof and Counterexample IV: Division into Cases and the Quotient-Remainder Theorem
- 4.5 Indirect Argument: Contradiction and Contraposition
- 4.6 Indirect Argument: Two Classical Theorems

Chapter 5: Sequences, Mathematical Induction, and Recursion

- 5.1 Sequences
- 5.2 Mathematical Induction I
- 5.3 Mathematical Induction II

Chapter 6: Set Theory

- 6.1 Set Theory: Definitions and the Element Method of Proof
- 6.2 Properties of Sets
- 6.3 Disproofs and Algebraic Proofs

Chapter 7: Functions

- 7.1 Functions Defined on General Sets
- 7.2 One-to-One and Onto, Inverse Functions
- 7.3 Composition of Functions
- 7.4 Cardinality and Sizes of Infinity

Chapter 8: Relations

- 8.4 Modular Arithmetic and \mathbb{Z}_n
- 8.5 The Euclidean Algorithm and Applications