

MATH 308: Discrete Mathematics
Fall 2010

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Office Hours: Office hours to be announced. Of course, appointments are always welcome.

Catalog Description

MATH 308. Discrete Mathematics. (3-0-3); I. Prerequisites: *MATH 170, 275, and either CS 303 or MATH 300.* An introduction to the concepts of sets and functions, mathematical logic, and proof; elementary counting principles; recurrence relations and recurrence models; algorithmic efficiency; the fundamentals of graph theory.

Textbook

E.A. Bender and S.G. Williamson, *Foundations of Combinatorics with Applications*, Dover (2006). The text is freely available at <http://math.ucsd.edu/~ebender/CombText/>. We will cover as much of the text as time permits.

Grading and Academic Honesty

Your grade will be based on homework (50%), two midterm exams (30%), and a comprehensive final exam (20%). Class participation can influence your final grade. The traditional 60 – 70 – 80 – 90 scale will be in effect.

We will have weekly written homework assignments which will basically follow the lecture topics and include proof and conceptual problems. Unless specifically stated otherwise, you will be permitted to work with other students in the class on homework assignments. However, all writeups should be your own work and you should not show them to anyone other than the instructor until after they have been graded. The use of the Discussion Board is highly encouraged for all problem sets.

Some assignments will involve proofs and derivations that will be turned in in class, while others will consist of calculation-based problems on Blackboard. The use of a graphing calculator or a computer algebra system with graphing capabilities will be required to complete certain portions of the assignments.

Cheating in any form will not be permitted and will be dealt with according to the harshest penalties permitted in the Student Handbook.

Attendance Policy

You are responsible for any missed work, assignments, or activities. Makeup work may be permitted with a valid excuse. Please notify the instructor as soon as possible, preferably by email, if you will not be in class. Attendance in at least 90% of all classes is necessary, but not sufficient, in order to receive an

“A” in the course.

Americans with Disabilities Act (ADA)

In compliance with the ADA, all students with a documented disability are entitled to reasonable accommodations and services to support their academic success and safety. Though a request for services may be made at any time, services are best applied when they are requested at or before the start of the semester. To receive accommodations and services the student should immediately contact the Disability Services Coordinator in the Office of Academic and Career Services, 223 Allie Young Hall, 606.783.5188, <http://www.moreheadstate.edu/acs/>

Emergency Information

Emergency response information will be discussed in class. Students should familiarize themselves with the nearest exit routes in the event evacuation becomes necessary. You should notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency evacuation. Students should familiarize themselves with emergency response protocols at <http://www.moreheadstate.edu/emergency/>.

Tentative Schedule

Week	Topic
1 – 3	Proof Techniques
4 – 8	Fundamental Counting Techniques
9 – 11	Introductory Graph Theory
12	Functions
13 – 14	Recurrence Relations and Recurrence Models
15	Algorithm Efficiency

Teacher Education Statement

“Community Engagement: A Light To and From the Mountains” The Professional Education Unit in the Department of Mathematics and Computer Science at Morehead State University delivers rigorous, high quality programs and courses that prepare professionals informed by NCTM and MAA standards - preparing professionals to improve the schools, quality of life, and the communities in which they live and serve. This statement is not only the strategic mission for the department, but it also incorporates the conceptual framework that guides its activities.

Overall Course Structure

MATH 308 incorporates the following KY Teacher Standards:

- Coherent Instructional Design with clear learning expectations for all students (S1, NCTM Curriculum and Teaching)
- A learning climate that enables students to use communication skills as

they sharpen their problem solving skills and actively acquire new knowledge (S2, NCTM Learning, EPBS Theme of Closing the Achievement Gap)

- High expectations for learning and using multiple representations to address diverse learning styles (S3, NCTM Equity, EPBS Theme of Diversity)
- Multiple ways of assessment and self-assessment (S4, S5, and S8, NCTM Assessment, EPBS Theme of Assessment)
- Use of technology to support teaching and learning (S9, NCTM Technology, EPBS Theme of Use of Technology).

Note: S1 - S9 refer to specific KY Teacher Standards; included are also cross references to NCTM Principles for School Mathematics and the Kentucky Education Professional Standards Board Themes (EPBS).

Learning Goals

Learning goals of MATH 308 integrate the following National Council of Teachers of Mathematics (NCTM) standards. Students will:

- Build new mathematical knowledge through problem solving. (POS 2.12)
- Select and use various types of reasoning and methods of proof (POS 2.12)
- Communicate mathematical thinking coherently and clearly to peers, professors, and others (POS 2.8, 2.12, KAEM Goal 1)
- Understand how mathematical ideas interconnect and build on one another to produce a coherent whole. (POS 2.7, 2.8, 2.11, 2.12)
- Use of multiple representations to model and interpret physical, social, and mathematical phenomena (POS 2.11, 2.12, KAEM Goal 2)

Kentucky's Academic Expectations included in the Program of Studies (POS) and the goals for Kentucky Academic Expectations for Mathematics (KAEM) are referenced. These goals are connected to the core content for the Kentucky Commonwealth Accountability Testing System (CATS) which align the Core Content for Mathematics Assessment Version 4.1 with the American Diploma Project mathematics benchmarks.