

Course: **Discrete Mathematics.**
Course code: **NSC562.**
Credits: **4.**
Level: **Introductory.**
Prerequisite: **None.**
Location & Time: **Sci217, MWF 10.30-11.20am.**
Instructor: **John Arhin, jarhin@marlboro.edu**
Website: **<http://cs.marlboro.edu/courses/fall2009/discrete/home>**
Course Text: **Combinatorics Through Guided Discovery by Ken Bogart**

The URL for the course text is as follows:

http://www.math.dartmouth.edu/archive/kpbogart/public_html/ComboNotes3-20-05.pdf

Introduction

Discrete math is the study of mathematical objects on which there is no natural notion of continuity. Examples include the integers, networks, permutations and search trees. After an introduction to the tools needed to study the subject, the emphasis will be on you *doing* mathematics. Series of problems will lead gradually to proofs of major theorems in various areas of the discipline. This course is recommended for those intending to do advanced work in math or computer science.

Content

The following topics will form the core of the course:

- Counting problems. How many
- Techniques:-
 - Recursion. Breaking the problem up into smaller parts that each look similar to the original problem.
 - Induction. Method of mathematical proof.
 - Bijections. Extremely strong connections between two seemingly unrelated collections of objects.

Grading

Quizzes: 10%.
Final Project 20%.
Assignments: 30%.
Final Exam: 40%.

Quizzes:

There are 6 chapters in the course text. Please expect a small quiz after chapters 2, 4 and 6, where each quiz covers the material since the previous quiz. Each quiz is worth 5%, and the best two marks will count towards your final grade.

Final Project:

Consists of a paper and a presentation towards the end of term. For the project, you will each investigate a general counting problem that interests you, and solve it using the techniques covered in the course. If you prefer you can instead take a well known counting problem and review the literature on the problem. Please note that full marks for the final project will not be awarded for just solving a problem, correctly or otherwise. Instead, full marks for the

project will be awarded for a good review of the problem, correctly applying the techniques covered in class and clearly explaining the arguments involved in your work in your own words.

Assignments:

There will be weekly assignments of some of the questions from the course text.

Final Exam:

It will be a 24 hour take home exam. The questions will be related to the questions covered in the assignments.

Note that the prompt submission of work together with class participation are expected in this course. Your performance in these areas will influence your final result by up to one letter grade.

Final comments

You are expected to be aware of the college's policy on academic integrity and to abide by it. It can be found on the college website, and is linked from the course website. Please come and talk to me if anything is unclear.

This is a four credit course. This means you should be expecting to spend in the region of twelve hours each week (including class time) working on it.

If you have a medical condition or disability that I (as your instructor) should be aware of please contact Megan M. Littlehales in the Health Center, who will in turn contact me.