MATH 3012A: Applied Combinatorics
11 May - 30 July 2015
MWF 9:20 - 10:30 in Molecular Sci/Eng G011
Course Webpage

Instructor	Shane Scott
Email	scottsha@gatech.edu
Office	Skiles 252
Hours	MWF11-12
	or by appointment

Welcome to Applied Combinatorics! Please attend all lectures. Come prepared with your e-clicker and participate. If you haven't interupted me with a question, you're doing it wrong.

Textbook: Keller and Trotter. Applied Combinatorics. 2014. Available online from Prof. Trotter's website.

Resources:

- T-square will host grades and assignments.
- Piazza will host online class Q&A and some written assignments.
- Prof. Trotter's web page has an archive of past course exams.
- Mathlab in Culc 280 offers free tutoring from recitation instructors. Check the link for summer hours.
- The Internet. Youtube and sites like Patrick Just Math have many helpful tutorials. Forums like Stack Exchange are great for asking questions when you are stuck and want help.

Course Objectives: We will look at a variety of discrete structures common to applications and build up basic techniques of counting, recursion, algorithms, and graph theory. Our emphasis will be on problem solving and communicating solutions.

Course Outline:

Module 1: Discrete Structures
§A/1: Motivations and Preliminaries ..... 2 lectures
§2 : Strings, Sets, and Binomial Coefficients ..... 2 lectures
§3: Induction ..... 2 lectures
§4: Pigeon Hole and Complexity ..... 2 lectures

§5: Graph Theory ..... 3 lectures
§6: Posets ..... 1 lecture
Exam–Chapters 2-5 ..... 10 June
Module 2: Enumeration
§7: Inclusion-Exclusion and the Twelve-fold Way ..... 2 lectures
§8: Generating Fucntions ..... 2 lectures
§9: Recurrence ..... 2 lectures
§15: Polya Counting ..... 2 lectures
Exam–Chapters 6-9 ..... 1 July
Module 3:
Graph Algorithms ..... 2 lectures
Network Flows ..... 4 lectures
Final Exam–Comprehensive ..... 30 July 11:30-2:20

Grade Policy: Weekly homework or quizzes will be administered in T-square. No late submissions will be considered. There will be two topic midterms and a cumulative final. Grades will be computed with the following weights

(a) Homework $\frac{1}{5}$
(b) Two Midterms $\frac{1}{5}$ each
(c) Final Exam $\frac{2}{5}$

Cutoff grades will be F=[0,60), D=[60,70), C=[70,80), B=[80,90), A=[90,100]. Make-up examinations will be given only in the event of a valid, documented excuse. Request regrades within one week of return.

Honor Code: All students are expected to comply with the Georgia Tech Honor Code. Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Office of Student Integrity. The institute honor code is available at http://www.honor.gatech.edu.

Important Dates:

First Class ..... 11 May
Add/Drop Deadline ..... 15 May
Memorial Day (No Class) ..... 25 May
Exam ..... 10 June
Withdraw Deadline ..... 28 June
Independence Day Break (No Class) ..... 3 July
Exam ..... 1 July
Last Class ..... 24 July
Course Final ..... 30 July 11:30-2:20