Math 96 Syllabus

Fall 2023

Lecture: Friday 4:00-4:50pm HSS 4025
Course Webpage: `http://cseweb.ucsd.edu/~dakane/Math96/`

Professor: Daniel Kane
Email: dakane "at" ucsd.edu
Office Hours: Wednesdays 3:00-4:30 in CSE 4212 or by appointment.

Course Description: Math 96 will cover basic techniques in mathematical problem solving with a view towards improving performance in the William Lowell Putnam Competition.

Prerequisites: A passing grade in Math 20A or equivalent.

Exams: There will be no formal final exam for the class, but students will be expected to sit through at least one of the two halves of the Putnam competition, held this year 8am-11am and 1pm-4pm on Saturday, December 2nd. Details about registration will be available shortly.

Homework: Homework we will be due *at the start of class* each week except for the first week, Veterans Day, Thanksgiving week, and the last week of the quarter. Please be sure to submit homeworks by the start of class, as late submissions may not be accepted. If you cannot make the beginning of class, you may have another student turn it in for you, or arrange another method to get it to the instructor on time. In order to pass the class students will be expected to finish at least five out of the seven homeworks. Homeworks will typically be of one of two types, usually alternating between them between weeks:

- Problem solving homeworks: Here students will be asked to solve one problem from a list of practice problems.

- Solution writing homeworks: Here students will be asked to write an easy-to-follow, correct and well-written proof for a problem solved recently in class.

Write-up Guidelines: All homework questions will require you to write complete mathematical proofs. Also be sure to:

- Write your name on the top of the submission.

- Clearly designate which problem you are solving.

- If your submission is more than one page long, make sure to number all pages and staple them together.

- Write legibly.

Collaboration Guidelines: Students are encouraged to collaborate on homework assignments. You should feel free to discuss the problems and talk about how to come up with solutions, or about how to structure proofs. On the other hand, you are expected to write up your solution independently of any collaborators, and you *should not* share written solutions to homework problems with other students before the homework deadline. If you do collaborate with other students on the homework, you should make sure to list any collaborators that you had. Additionally, since this is a course focusing on individual problem solving ability, it is strongly recommended that you spend at least an hour thinking about a homework by yourself before discussing it with others.

Use of Outside Resources: You should not attempt to search for homework solutions online or by asking an artificial intelligence for help, doing so will be considered academic dishonesty.

Commencement of Academic Activity: If you need certification of commencement of academic activity for financial aid purposes, please fill of the Canvas quiz by the end of the day on October 13th.

Academic Integrity: Academic integrity will be taken very seriously be the course staff. Breaches of integrity may have broader consequences outside of the assignment in question. The following will all considered to be breaches of academic integrity:

- Collaboration on homeworks beyond the scope outlined in the section above (including sharing of homework solutions with other students before the homework deadline).

- Failure to cite collaborators on homeworks.

Grading: Grading will be pass/fail. The requirements for passing are:

- Submit reasonable solutions on time to at least five of the seven homeworks.
  AND

- Sit through at least one of the two sessions on the Putnam (you are not required to solve any problems on it).

Lecture Schedule: Lectures will alternate between two types:

- Technique lectures: Here the professor will discuss basic results in an area and some of the techniques applicable to solving problems in this field.

- Problem solving lectures: Here the class will be provided with a list of problems, that we will attempt to solve via group discussion moderated by the professor.

Below is a rough schedule for topics covered in the class:

September 29th	Techniques: Basic problem solving strategies
October 6th	Practice
October 13th	Techniques: Number Theory
October 20th	Practice
October 27st	Techniques: Polynomials
November 3rd	Practice
November 10th	Veterans Day: No class
November 17th	Techniques: Combinatorics and Function Iteration
November 24th	Thanksgiving weekend: No class
December 1st	Techniques: Testing Strategies
December 2nd	Putnam Exam
December 8th	Exam Postmortem