SYLLABUS
Putnam Exam Seminar, Fall, 2005

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I. COURSE DESCRIPTION: The Putnam Exam is a national collegiate math competition held the first Saturday in December. The exam is extremely difficult: many years, the median score is a 0. In this one-credit course, we will study problem solving techniques in order to prepare for the Putnam. We will use the text entitled The art and craft of problem solving by Paul Zeitz. We will introduce a new type of problem each week, and you will be expected to spend 2 hours solving and writing up your solution for the next class. A basic outline is as follows:

- **8/31** Introduction, Chapter 1, section 2.1
- **9/7** Approaches Chapter 2
- **9/14** Fundamental tactics (emphasis on Pigeon Hole principle) 3.1-3.3
- **9/21** Invariants, graph theory 3.4, 4.1
- **9/28** Complex numbers, generating functions, sets and functions 4.2, 4.3, 5.1
- **10/5** More algebra 5.2-5.5
- **10/12** Midterm
- **10/19** Combinatorics 6.1-6.4
- **10/26** Number theory 7.1-7.2
- **11/2** More number theory 7.3-7.5
- **11/9** Calculus 8.1-8.2
- **11/16** Calculus 8.3-8.4
- **11/30** Final Putnam preparation
- **12/7** Putnam recap

You will be required to take the Putnam exam, spending at least an hour (it is a six hour exam). Anyone who scores at least a 20 on the Putnam will retroactively receive an A+ in the course!

II. GRADING Attendance will be 30% of the final grade. Any unexcused absences will result in a 5% (off your final grade) penalty. Homework will be 50% of the final grade, and the midterm will be 20% of the final grade. In order to get an A in this course, you will need to do at least 3 ★ problems during the course of the semester. A ★ problem is a difficult problem, and you need to pledge that you did not receive any help at all (other people, internet solutions, book solutions). In order to get ★ credit, the solution must be worthy of a 9 or 10 Putnam problem score. The purpose of this is to encourage you to stretch yourself and try harder problems: that is definitely the best way to prepare for the Putnam.

III. ACADEMIC HONESTY: Solutions to homework problems should be written up independently. You are welcome to discuss non-★ problems, but I don’t want you to copy each other’s solutions.