

Course Outline for MATH 3370, Putnam Exam Seminar

MATH 3370 Putnam Exam Seminar (1 unit)

Prerequisite: Consent of Instructor

Directed group study of mathematical problem-solving techniques. Class members are expected to participate in the annual William Lowell Putnam Mathematical Competition. Credit/No Credit grading only. Repeatable up to 4 units. 1 seminar. Formerly MATH 370.

Course Learning Objectives	
1	Use analytical thinking to solve problems.
2	Apply mathematical problem-solving techniques to solve competition style problems.
3	Write detailed, rigorous solutions of competition style problems

Expanded Course Content

Textbooks, materials, and/or other resources
No required textbook. Recommended text example: “Problem Solving Through Problems” by Larson.

Week	Readings	Topics of Discussion
1	Larson Chapter 1	Heuristics, Introduction to Problem Solving
2	Larson Chapter 2	Induction and the Pigeonhole Principle
3	Larson Chapter 2	Induction and the Pigeonhole Principle
4	Larson Chapter 3	Modular arithmetic, greatest common divisors, unique factorization
5	Larson Chapter 3	Modular arithmetic, greatest common divisors, unique factorization
6	Larson Chapter 4	Unique factorization of polynomials, abstract algebra
7	Larson Chapter 4	Unique factorization of polynomials, abstract algebra
8	Larson Chapter 5	Binomial coefficients, geometric series, telescoping series, power series

Week	Readings	Topics of Discussion
9	Larson Chapter 5	Binomial coefficients, geometric series, telescoping series, power series
10	Larson Chapter 6	Real analysis, including derivatives, integrals, mean value theorem, extreme value theorem
11	Larson Chapter 6	Real analysis, including derivatives, integrals, mean value theorem, extreme value theorem
12	Larson Chapter 7	Inequalities, arithmetic-geometric mean inequality, Cauchy-Schwarz inequality
13	Larson Chapter 7	Inequalities, arithmetic-geometric mean inequality, Cauchy-Schwarz inequality
14	Larson Chapter 8	Classical plane geometry, analytic geometry, plane geometry with complex numbers
15	Larson Chapter 8	Classical plane geometry, analytic geometry, plane geometry with complex numbers

Method of Assessment

The Credit/No Credit grading for this course will be based on participation, completion of practice Putnam exam problems, class presentations, and in-class practice Putnam exams. There will be no final assessment.

Instructional Mode

The instructional mode for this class is face-to-face. This designation means that the essential academic standards of the course require in-class student engagement, and thus remote instruction is not appropriate.