

## MATHEMATICS 295

### PROBLEM SEMINAR

#### I. Introduction

##### A. Catalog Description

In this class students and faculty discuss problems that cut across the boundaries of the standard courses and investigate general strategies of problem solving. Students are encouraged to participate in a national mathematics competition. This class meets one hour a week, is graded only on a pass/fail basis, is a 0 credit course, and may be repeated. *Prerequisite: Permission of instructor*

##### B. Objectives

By working on challenging and nonstandard problems in a cooperative atmosphere, student students will learn general problem solving strategies, gain a better understanding of the fundamental concepts from different areas of college mathematics, and develop confidence in their ability to deal with difficult mathematical questions. Students will find themselves prepared and encouraged to take part in The Putnam Mathematical Competition.

##### C. Prerequisites

Permission of instructor.

#### II. Topics

The selection of topics is left to the discretion of the instructor whose selection might include, but is not limited to:

- A. Problem Solving Heuristics
- B. Induction and the Pigeonhole Principle
- C. Arithmetic
- D. Algebra
- E. Series
- F. Intermediate Real Analysis
- G. Inequalities
- H. Geometry

#### III. Bibliography

- A. Gleason, R. Greenwood & L. Kelly, **The William Lowell Putnam Mathematical Competition, Problems and Solutions: 1938-1964**
- G. Alexanderson, L. Klosinski, L. Larson, **The William Lowell Putnam Mathematical Competition, Problems and Solutions: 1965-1984**
- L. Larson, **Problem Solving Through Problems**
- S. Greitzer, **International Mathematical Olympiads 1959-1977**
- M. Klamkin, **International Mathematical Olympiads 1979-1985**
- D. Newman, **A Problem Seminar**
- P. Zietz,, **The Art & Craft of Problem Solving**