



Math 402 Inquiry Seminar (Early Fall Start 2008)

Group Theory and Rubik's Cube

What is an Inquiry Seminar? A four-week Early Fall Start class targeting recently declared Math majors (or those who anticipate declaring). The seminar offers an in-depth introduction to an aspect of mathematics and a glimpse at what makes it exciting.

What is the detailed description of the Seminar? In 1974, a twenty-nine year old Hungarian sculptor and architect invented a puzzle called "Rubik's Magic Cube". The magic cube has fascinated millions of people worldwide. By 1982, "Rubiks Cube" was a part of the Oxford English Dictionary. More than 100 million cubes have been sold worldwide. About 150 years earlier, a young French teenage mathematician named Evariste Galois was developing a new branch of mathematics called "group theory". Galois was not working on solving puzzles, rather he was studying solutions of algebraic equations. For example, we are all familiar with the classical "quadratic formula" for equations of second degree and a majority of the important mathematics of the sixteenth century focused on solving equations of degrees three and four. In the end, Galois' "group theory" provides a unified approach to study solutions of equations of all degrees. In our seminar, we will marry Galois' group theory with Rubik's magic cube and come away with a mathematical understanding of how and why the Rubiks cube puzzle can be solved. For the beginning mathematics major, this seminar illustrates an important and powerful central theme in the subject: the development of a general theory (group theory) with wide-ranging and sometimes surprising applications (the solution to the cube).

When, credits and cost? The seminar runs Tuesday August 26th - Friday September 19, TWThF, 9:30am-12:00 noon. Students receive 5 graded credits of Math 402. There is NO COST to students in the seminar; the college will pay all tuition and fees.

What are the prerequisites? The seminar targets recently declared mathematics majors or those who are strongly considering a mathematics major. Completion of Math 310 (or equivalent) prior to Early Fall Start is required.

How do I apply? If you are interested, pick up an application form in the Math Student Services Office, C-36, Padelford Hall. Applications will be evaluated as they are received, giving preference to those applying before April 28. The class is limited to 20 students.

Who is the instructor and what if I have more questions? Dave Collingwood is a Professor in the Department of Mathematics at the UW and will be the course instructor. If you have questions, please contact him directly at colling@math.washington.edu