**Math 271: Problem Solving Seminar – Modeling**

Credit can be received for this course in at most four semesters.

Dr. Roland Minton, Trexler 270-C, 375-2358
The class meets every Monday evening from 7:00pm to 9:00pm in Trexler 271, January 18 - February 22.

**Course Objectives:** Develop an understanding of how applied mathematics problems can be solved using previous knowledge. Develop an ability to ask and answer questions about a proposed method of solving a problem. Develop an interest in and enjoyment of attempting difficult mathematics problems. Improve your problem-solving ability. Improve your perspective on how different areas of mathematics relate to applications. Improve your confidence when presented with a new problem.

**Intended Learning Outcomes:** At the end of the course, successful students will be able to
- Start from a description of a problem in everyday language and develop a mathematical model related to a solution of some aspect of the problem.
- Apply a variety of mathematical techniques to a problem, and identify what works the best.
- Read a proposed solution of a problem and identify potential sources of error.
- Distinguish continuous from discrete problems and apply appropriate techniques to each.

**Attendance Policy:** Perfect attendance is necessary! This is a seminar course, where the students share presentation of material with the faculty. Participation includes doing presentations yourself, asking questions of classmates and generally being involved in the solution of each problem.

**Academic Integrity:** The college policy is fully supported. You will gain more from solving a problem yourself than finding a solution online or in a book, but you may use any available resource as long as you give appropriate citations, can present the work in your own words and answer relevant questions about the work.

**Study Problems:** Problems will be assigned throughout the course, including problems from previous editions of the Mathematical Contest in Modeling. You are not expected to solve every problem. The problems are open-ended enough that different students can reasonably make different assumptions and find different results. There are not unique solutions here; partial solutions can be great. Students who make progress on a problem will present their work to the class. Team presentations are allowed. The assumptions and work will be discussed respectfully but thoroughly by the class. Along with making sure that the mathematics is correct, we want explanations to be clear and the logic to be elegant. The more contributions you make, the better your grade and the more you benefit from this course.

**Teaching Style:** This is a seminar course, so the role of the professor should be minimal. Students will present problems, discuss solutions and determine the content and value of a given class session. You will receive significant guidance, but be prepared to participate!

**Tests:** None. You should plan on competing in the Mathematical Contest in Modeling on February 18-22. The contest is administered on campus. Some students will be part of official Roanoke College teams, but students who compete unofficially will complete the same tasks.

**Grading:** To earn an A, you must attend every session, contribute to several models, participate in class discussions and “compete” in the Mathematical Contest in Modeling. The B grade represents competition in MCM but only moderate class participation. The C grade represents no competition or minimal class participation. To pass the course, you must attend most sessions and contribute to at least one model.