Department of Mathematics
University of Utah

COURSE SYLLABUS FOR MATHEMATICS 5740 FOR SPRING 2019

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Office Hours: To be arranged during class.

Text: Instructors notes which will be available on Web CT.

Description of the Course:

Mathematical Modeling is mathematics in application. How do you take a real world problem and use mathematics to find an answer? The focus of this course will be on getting answers through approximation and sometimes crude modeling rather than getting bogged down in detail. The goal is to devise appropriate “mathematical technology” for solving problems while keeping things simple. Topics to be covered include, scaling and dimensional analysis, queueing theory, apportionment of resources, optimization, monte carlo methods, population dynamics, traffic flow, game theory, modeling elections and auctions, and the ranking of football teams and websites, among others. The art of mathematical modeling will be learnt through these examples, but can be applied to a wide body of problems.

Prerequisites: "C" or better in MATH 2250 (or MATH 2270 and 2280). Numerical analysis courses such as MATH 5600 or CP SC 5220 are NOT a prerequisite. (The course announcement on the web is inaccurate in this respect: the emphasis will be placed on modeling rather than on numerical tools.)

Assignments You are strongly encouraged to collaborate with other class members in this course. If you wish you may work with at most three other people on the assignments and hand in a single joint assignment.
Modeling project: There will be no exams in this course. Instead you will be required to model a problem of your own choosing, and give a short in-class presentation. A brief one paragraph description of your problem to be modeled is due March 24th. The modeling report will be due April 9th. Again you are encouraged to collaborate with at most three other people on the modeling project.

Grading Policy: Grades will be based on the assignments (40% of the grade), on the modeling project report (50% of the grade) and on its presentation (10% of the grade).

Late Homework: If you like gambling you can hand your homework in after the due date: if I get it before I’ve started grading you will get full credit, otherwise zero credit. It might be a risky gamble as I’ll try to grade the homework as soon as possible.