MATH 377 [A01] — Course outline
Dept. of Mathematics and Statistics, University of Victoria
January 2018

Instructor:	Rod Edwards (edwards@uvic.ca)
	DTB A542, 250-721-7453 (visit preferred, otherwise e-mail)
Research areas:	Mathematical biology; models of gene-regulatory networks,
	biochemical networks, neural networks, and analog electronic networks
Office hours:	Mon. 3:00 – 4:00; Thu. 3:00 – 4:00
Course web page:	`http://www.math.uvic.ca/courses/2018s/math377/a01/`
Prerequisites:	Multivariate calculus (200 or 205); differential equations (201 or 204);
	linear algebra (110 or 211); some elementary probability theory (such as
	what you get in STAT 252, 254, 255 or 260).
	ODEs and PDEs beyond MATH 201/204 will help but are not required.
Textbook:	**Mathematical Modelling: A Case Studies Approach**, by Illner,
	Bohun, Carruthers and van Roode. Some supplementary material
	may also be distributed.

Topics: Will include some (but probably not all) of the following:

- Crystallization dynamics;
- Hydrostatic pressure in a tunnel;
- Financial mathematics — mortgages and annuities;
- Dimensional analysis with applications including energy released by a nuclear bomb;
- Predator-prey systems;
- Optimal control of renewable resource management — fisheries;
- Functional equations in sociology — formal justice;
- Traffic dynamics — microscopic and macroscopic models;
- Spread of epidemics (and marketing) on social networks;
- Action potentials in neurons;
- Biochemical kinetics.

Usually, we have time to cover 7 or 8 of these topics, with about a week and a half per topic.

What makes this course different?: The course is designed to familiarize you with mathematical modelling through real-world case studies, rather than simplified textbook theory. You will be tested on your understanding of the models we examine here (their derivation and analysis), but these skills should be transferrable to other modelling situations you may encounter in future.

Evaluation: Grades will be determined by scores on regular homework assignments (approximately one every two weeks), a midterm test (scheduled tentatively for **Thu. Feb. 8, 2018**) and the final examination. The weights of these three components will be as follows:

      Assignments: 20%   **Midterm test: 20%**   **Final examination: 60%**

Both the midterm and the final will be "open book" and "open notes".

Course regulations:

There will be no make-up tests and no late homework will be accepted. If you miss a homework assignment or a test due to illness, accident, family affliction, or other situation that merits an academic concession, you should notify me within 7 calendar days and provide a written request to be excused, as well as supporting documentation. In such cases, your other scores will be prorated. If you have a question or concern about your mark on a test, you must bring it to my attention within 7 calendar days of the date the test was returned. You are strongly advised NOT to make final plans for travel or employment during the final examination period, since special arrangements will NOT be made.

Departmental policies will be strictly enforced. See:
https://www.uvic.ca/science/math-statistics/current-students/undergraduate/course-policies/index.php.

Course Evaluation Surveys:

I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey you will receive an email inviting you to do so. You will need to use your UVic netlink ID to access the survey, which can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

Accessibility:

Students with diverse learning styles are needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible. The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations http://www.uvic.ca/services/cal/. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Math Club:

Students in Undergraduate Mathematics and Statistics (SUMS) is an undergraduate course union that conducts fun and informative activities — highly recommended! Please see http://www.uvic.ca/science/math-statistics/current-students/undergraduate/sums/index.php for more information.