

MATH/STATS 2300: *Mathematical Modelling*

Course Description (from University Calendar): By using fundamental calculus concepts in a modelling framework, the student investigates practical problems chosen from common experiences encompassing many academic disciplines, including the mathematical sciences, operations research, engineering and the management and life sciences. A significant part of the class is learning to use MAPLE as a mathematical tool.

Co-requisites: MATH 2030 and MATH 1000

Contact:

Class time: TR 13:05 - 14:25 LSC-PSYCHOLOGY P5263

Instructor: Rebecca McKay,
wrebecca@mathstat.dal.ca,
Chase Building Rm 312

Office hours: TR 14:30 - 16:30 Chase Building 312 or by appointment.

Course Webpage: www.mathstat.dal.ca/~wrebecca/math2300

Resources:

Text: Giordano, Fox, Horton and Weir, *A First Course in Mathematical Modeling*

Other readings and resources will be posted on course website (www.mathstat.dal.ca/~wrebecca/math2300).

Course Evaluation:

1. Assignments (5 in total) — **40%**
2. Midterm exam — **25%**
3. Final exam — **35%**

Although working together on assignments is encouraged, all submitted work must be done by the individual. That is, you can discuss ideas and strategies for solving problems, but each student must solve and write up solutions on their own.

All assignments are due by 4:30pm on the due date.

The midterm will be in class on March 4. The final exam will be scheduled by the Registrar's office.

Converting to letter grades:

[0-50) F, [50-55) D, [55-58) C-, [58-62) C, [62-65) C+, [65,70) B-, [70-75) B, [75-80) B+, [80-85) A-, [85-90) A, [90-100] A+

Note from Student Accessibility Services:

Students with disabilities are encouraged to register as quickly as possible at the Student Accessibility Services if they wish to receive academic accommodations. To do so please phone 494-2836, email access@dal.ca, drop in at the Mark A Hill Accessibility Centre or visit our website www.studentaccessibility.dal.ca. Students are also reminded that, for your convenience, all forms are now available on our website.

Course Schedule:

Please note that course schedule may change. See website for any changes.

Dates	Material covered	Note
Jan 5, 7	Intro, Modelling change with difference equations (1.1, 1.2)	
Jan 12, 14	Dynamical systems, Systems of difference equations, Difference operators (1.3, 1.4)	Assignment #1 handed out
Jan 19, 21	Maple intro, Mathematical models, Proportionality (2.1, 2.2)	
Jan 26, 28	Geometric similarity, Graphical fitting (2.3, 3.1)	Assignment #2 handed out Assignment # 1 due on Jan 26
Feb 2, 4	Analytic fitting, Least-squares fitting (3.2, 3.3)	
Feb 9, 11	Choosing models (3.4), Polynomial models (4.2)	Assignment # 3 handed out Assignment # 2 due on Feb 11
Feb 16, 18	Smoothing (4.3), Cubic splines (4.4) Population growth (11.1), Drug dosage (11.2)	Midterm review sheet handed out
Feb 23, 25		Study Break
Mar 2, 4	Graphical solutions (11.4)	Midterm — Mar 4 in class
Mar 9, 11	Numerical approximations (11.5),	Assignment # 4 handed out Assignment # 3 due on Mar 11
Mar 16, 18	Separation of variables (11.6), Linear equations (11.7)	
Mar 23, 25	Modelling using Graph Theory (8.2, 8.3, 8.4)	Assignment # 5 handed out Assignment # 4 due on Mar 25
Mar 30, Apr 1	Simulation Modelling (5.1, 5.2, 5.3)	
Apr 6, 8	Review	Assignment # 5 due on Apr 8