

Math 4428, Sec. 2: MATHEMATICAL MODELING
Syllabus: SPRING 2020

Class Times and Location:

12:20 pm – 01:10 pm MWF, LindH 203.

Instructor: Mikhail Safonov, VinH 231, tel: 625-8571,
email: safon002@umn.edu, <http://www.math.umn.edu/~safonov>

Office Hours: MWF, 1:20 pm – 2:00 pm, or by appointment.

Textbook: *Mark M. Meerschaert*, Mathematical Modeling. 4rd Edition, 2013, Academic Press/Elsevier. Free download packages for this book are available at: <http://www.sciencedirect.com/science/book/9780123869128>

Math 4428 includes different modeling techniques for application of mathematical tools to real world problems, which require analysis and eventually decision-making. We plan to cover Chapters 1–5 and 7–8 of the textbooks (with some exclusions), which are grouped in three part:

Optimization (sensitivity analysis, Lagrange multipliers, linear programming),

Dynamical modeling (steady-states, stability analysis, eigenvalue methods, etc),
and if time permits,

Probabilistic methods (probability/statistical models, Markov chains).

We will have a Midterm and a Final Exams. These are closed book exams (no books, no notes), but calculators can be used. TI-89 calculators are sufficient for our purposes.

Homeworks: There will be 4 homework projects due at the beginning of class
on Wednesdays, February 19, March 18, April 8, and April 29.

Late homeworks will receive less than full credit, and possibly zero credit.

Midterm Exam: on Wednesday,
March 25 (9th week), during class time.

Final Exam:
Tuesday, May 12, 10:30 am – 12:30 pm, LindH 203.

Grading: *Homeworks* - 35% total for 4 HW projects,
Midterm Exam - 25%, *Final Exam* - 40%.

Missed exams: Make-up Final exams will be given to students who have a **valid** reason for missing an exam. Such students must notify their instructor prior to the exam, and the reason must be documented. There will be **no make-up Midterm exams**. A proportional part of the score for the Final exam will be used instead for students who have a valid documented reason for missing a Midterm exam.

Incompletes: The grade of **I** can be assigned only to students who have taken and passed one Midterm Exams and who have a **valid** excuse for being unable to take the Final Exam.