Course Syllabus - MATH 8401, Fall 2018
MWF 9:05-9:55 AM, VinH 213

Instructor: Ru-Yu Lai (http://www-users.math.umn.edu/~rylai)
Office: VinH 229
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Office Hours: MF 10-11am, or by appointment.
Textbooks: We shall draw material from:

- James P. Keener: Principles of Applied Mathematics
- Trefethen and Bau: Numerical Linear Algebra
- Sam Howison: Practical Applied Mathematics

Other material will be used as necessary. There is no need to buy these textbooks.

Prerequisites: Advanced calculus, linear algebra.

Course Description: This is the first part of a two-semester sequence introducing the ideas and methods of applied mathematics. The two parts MATH 8401 and MATH 8402 can be taken separately. MATH 8402 will be offered in the Spring semester.

A course in applied mathematics can potentially cover a wide variety of topics. We focus on mathematical models that involve ordinary and partial differential equations (ODE or PDE). Our emphasis will be on analytical tools, although occasional mention will be made to numerical methods. A list of topics for the first semester is given below:

- Linear Algebra
- Fourier Series
- Distributions and the Fourier Transform
• Integral Equations

• Radon transform and X-ray transform

In MATH 8402, we shall focus mainly on asymptotic methods.

**Grading:** Biweekly/weekly homework assignments will be given, and there will be two midterms, in early October and in early November (date TBD). We will also have a take-home final exam.