MATH246H, Spring 2024: *Differential Equations for Scientists & Engineers*
UPDATE 01/24/2024

Instructor Dr. T. von Petersdorff, office MTH 4409, e-mail **tvp@math.umd.edu**, **office hours Tue 10-12** (or by appointment, also via Zoom)

ELMS Course Page provides additional material for the course. Please check this page regularly.

Textbooks **(1)** Online Text by D. Levermore (free, link on ELMS page)
(2) "Differential Equations with MATLAB" by R. Hunt et al.
we need the version with **copyright 2019**, "Third edition, **revised version**"

Exercises There are exercises with answers at the end of each section. **I expect that you do these exercises** until you feel you understand the material. The exam problems will be similar to these exercises.

Syllabus

- First order ODEs: linear, autonomous, separable equations, applications, numerical methods
- Higher order linear ODEs: homogeneous and inhomogenous case, constant coefficient case
- Laplace transform method, piecewise forcing functions, impulse forcing functions
- 1st order systems of ODEs: general theory, constant coefficients, eigenvalue method
- autonomous planar systems: phase portraits, stability of stationary points, linear vs nonlinear case

Grading Policy The grade will be obtained from a weighted average of exams, homeworks, and final exam (see below). With a total percentage $\geq 90\%, 80\%, 70\%, 60\%$ you are guaranteed an A, B, C, D, respectively. These cutoffs may be lowered slightly.

3 Exams (Total 45%) In the case of *legitimate* and *documented* absences according to the University Attendance Policy (ugst.umd.edu/courserelatedpolicies.html) a makeup exam will be given. This can be an oral exam. You must notify me of any such absence as soon as possible.

about 5 Assignments (Total 25%) containing both paper&pencil problems and Matlab problems (hand in a single PDF file on ELMS). Assignments must be done individually by each student. Sharing of material (in particular code) is considered academic dishonesty. **You have to use Matlab "Live scripts"**.

Final Exam (30%) The cumulative final exam will be on **May 11, 1:30–3:30pm** (room will be announced)

Matlab This course will use Matlab. You can download Matlab for free from terpware.umd.edu. **Please read the "Matlab information" on ELMS.** If you are not familiar in Matlab you should **study the "Matlab Onramp" interactive tutorial immediately**.
Please read chapters 2, 3, 4 in "Differential Equations with Matlab" and try out the commands on your computer. Then **do the practice problem set on the ELMS page until February 12** (this will not be collected).