MATH 461, Spring 2015: *Linear Algebra for Scientists and Engineers*

Time & Place TuTh 9:30-10:45am in JMP 2202

Instructor Dr. T. von Petersdorff, office MTH 4409, e-mail tvp@math.umd.edu, office hours Wed 10–12 (or by appointment)

Textbook David C. Lay, *Linear Algebra and its Applications*, 4th edition. I will not follow the textbook very closely, and I recommend that you take notes. I will make some material available on the course web page (but not for every topic).

Syllabus (corresponding sections in the textbook are given in parentheses)

- Introduction: vectors, linear combinations and span of vectors, linear independence, matrices (4.1-4.3,2.1)
- Linear systems and their solution: Gaussian elimination, LU decomposition
  null space (kernel) and range of A and $A^\top$ (1, 2.5, 2.8,2.9, 4.6)
  determinant (3)
- Orthogonality: scalar product, Gram-Schmidt process, QR decomposition, least squares problems (6)
- Eigenvalue problems, symmetric matrices, quadratic forms (5)

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.

2 Exams (Total 35%) There will be no make-up exams. In the case of *legitimate* and *documented* absences according to the University Assessment Policy (www.testudo.umd.edu/soc/atedasse.html) the average of the remaining exams will be used. You must notify me of any such absence as soon as possible.

Homeworks (Total 35%) There will be about 4 assignments, containing both theoretical problems and computer problems with Matlab. **If an assignment is late**, there will be a **penalty of 15% for each day** after the due date. You can **hand in assignments** either **in class**, or you can slip them **under the door of my office** (MTH 4409) **until 9pm**. You **must** write the **current time and date** on your assignment when you slip it under the door, otherwise it will count as handed in on the next day. The homeworks must be done individually by each student. Sharing of material (in particular code) or writing wrong submission times on your homework is considered academic dishonesty.

Final Exam (30%) The cumulative final exam will be on Friday, May 15, 8:00–10:00pm in JMP 2202.

Matlab This course will use Matlab (version 7 or newer). You can download Matlab for free from terpware.umd.edu .

Course Web Page www.math.umd.edu/~tvp/461 gives additional information about the course, e.g., hints for using Matlab and for the homework problems. Please check this web page regularly.