

## Syllabus: Math 416 Spring 2022

Prof. P. Di Francesco

### 1. WHAT IS THIS COURSE ABOUT?

This is a proof-oriented course in linear algebra. We begin with a brief discussion on solutions to linear equations (2 weeks, [JH-RB] **Chap.1**). Then we cover vector spaces (2 weeks, [FIS] **Chap.1**), linear transformations (2 weeks, [FIS] **Chap.2**), determinants (1 week, [FIS] **Chap.4**), eigenvalues and eigenvectors (1 week, [FIS] **Chap.5**), inner products and spectral theory (4 weeks, [FIS] **Chap.6**), and canonical forms (1 week, [FIS] **Chap.7**).

### 2. LOGISTICS

2.1. **First week is online.** As per University rule, the first week of class (Wednesday January 19 and Friday January 21) will be held online. To connect, click on the zoom link on the course webpage.

2.2. **Room.** 341 Altgeld Hall.

2.3. **Time.** Class is held on Monday, Wednesday, Friday, *Sections D13/D14*: 11:00am to 11:50am.

2.4. **Course webpage.** The page at *learn.illinois.edu* will have announcements, homework assignments, some course notes, a news forum and a discussion forum. You need to be registered to access this page. If you can't register yet, email me your **netid** to be manually added.

2.5. **My coordinates.** *Email:* philippe at illinois dot edu. *Office:* 353 Altgeld Hall.

2.6. **Help hours.** *Office hours:* on Zoom, by appointment.

2.7. **Textbooks.**

- [JH]: *Linear Algebra* (Jim Hefferon), available from the course webpage, (used in the first two weeks of class);
- [RB]: *A First Course in Linear Algebra* (Robert Beezer), available from the course webpage, (used in the first two weeks of class);
- [FIS]: *Linear Algebra*, 4th edition, Friedberg-Insel-Spence, Prentice Hall/Pearson Education (main textbook for the class).

### 3. CLASS/HOMEWORK

3.1. **Before class.** Read the corresponding section of the textbook, as indicated on the course webpage.

3.2. **Homework.** Homework will be posted (approx. once a week) on the class website. Check before starting an assignment to make sure there have been no last-minute changes. The homework is due by the beginning of the class on the date on which it is listed as due. You can ask any questions in class about problems you have difficulties with. There is a no tolerance policy for late homework. To turn homework, scan your paper and produce a single pdf file (make sure it is readable), then deposit it in the "Your answers to Homework x" section.

You are strongly encouraged to form study groups early in the semester. You can use the Q/A discussion forum on the course website to ask questions about the material, to organize study sessions, etc. However, **copying homework is not permitted.** When you write up your homework assignments to be turned in, do so separately. Don't try to copy answers from the web: you will discover that doing so will be of no help at all in understanding the material. Papers should be written intelligibly. Solutions should be explained, proofs of statements detailed.

To allow for some flexibility, the two lowest homework grades will be dropped. Homework should be written neatly so the grader has no trouble reading your answers. Unreadable answers are assumed wrong by default. Hint: use scratch paper and copy solutions/explanations on a new sheet. Homework accounts for 30% of the total grade.

3.3. **Class participation.** Class participation is strongly encouraged and will result in bonus points.

#### 4. EXAMS

Midterms are held during regular class hours, same room. The final will take place in a room to be specified in due time. Each midterm accounts for 15% of the total grade. The final accounts for 40% of the total grade.

4.1. **Midterm exam #1.** Friday, February 25th, in class.

4.2. **Midterm exam #2.** Friday, April 8th, in class.

4.3. **Final.** Combined Exam: date to be fixed later

#### 5. GENERAL RULES

5.1. **In class.** No cellphones/laptops/electronic devices of any kind allowed at any time. No food/drink/chewing gum.

5.2. **During exams.** The above, plus: no calculators, no talking to other students.