MATH10202 Linear Algebra A 2019-20

These notes accompany the part of the course lectured by Mark Kambites.

What is Linear Algebra and Why Do I Need It?

Linear means **"to do with lines"**. **Linear algebra** is the algebra of **linear equations**, which are equations whose solution sets (when drawn in space) are **lines**, and higher dimensional analogues of lines called **linear subspaces**. Linear equations can be concisely and elegantly expressed using algebraic objects called **matrices**, and the first part of the course is mostly concerned with these. The subject is important for both pure mathematics and applications:

- Linear algebra expresses some of the fundamental objects of geometry in a formal algebraic way. It allows us to use equational reasoning to understand geometry.

- Many real-world problems (both those of a geometric flavour and others) are modelled with linear algebra, which provides a powerful toolkit to solve these problems.

Practicalities

Lecturer (first half). Professor Mark Kambites (email `Mark.Kambites@manchester.ac.uk`).

Notes and Lectures. Notes for Mark's part of the course will be provided **with gaps for you to complete in lectures**, on Mark's webpage at

`personalpages.manchester.ac.uk/staff/Mark.Kambites/la.php`

The notes form the definitive content of this part of the course, and you should expect to refer to them frequently. If you need the notes in a different format due a disability, please just let me know. The lectures will explain the same material, but sometimes more informally.

Exercises. Exercise sheets will be handed out in lectures, and contain instructions on when to do the exercises and what to hand in. They are an essential part of learning, so if you want to do well in the course you need to schedule time to attempt all of them (not just the ones for handing in!). Solutions will be made available when you have had a chance to attempt the questions yourself.

Office Hour. My office is **Alan Turing 2.137**. My office hour will generally be **15:30-16:30 on Tuesdays** during teaching weeks; it may sometimes be necessary to change this in which case details will be posted on my website, so please check there before making a special journey. If you can't make it to my office hour but need a personal meeting then please email or ask after a lecture for an appointment.

Supervisions and Homework. The exercise sheets tell you which exercises to hand in for which weeks; your supervision group leader will tell you exactly when and where to hand in. **Attendance at supervisions, and handing in homework, is compulsory.** Please make sure you arrive on time **with the exercise sheets**; group leaders may mark you absent if you come late or not properly prepared.

Assessment. The assessment for the course comprises homework and supervision attendance (10%) and a final exam (90%). The supervisions/homework for the first 6 weeks and Section A of the exam will cover my half of the course.

Feedback. Please let me know how you are finding the course, and especially if you think there are any problems with it. Feel free to speak to me after a lecture, email me, come along in my office hour, or even slip an anonymous note under my office door!

Books. The course is self-contained and full notes will be supplied, so you should not **need** to refer to any books. But if you would like an alternative viewpoint, the course webpage contains some suggested texts.