COURSE INFORMATION FOR MA20217 (ALGEBRA 2B)

SEMESTER 2, 2015/16

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I'll be available in EB1.1 before and after lectures, so feel free to talk to me then. You may also email me, or visit my office (we may agree on a time to talk later in the week).

Lectures. There are three lectures per week in EB1.1 on Wednesdays at 9:15, Thursdays at 15:15, and Fridays at 14:15. I'll confirm on Wednesday 3 February which lecture will be used as a problem class (once every two weeks).

Assessment. Assessment – 100% exam.

Course website: The course website contains information about MA20217. You'll be able to download lecture notes, problem sheets and solutions when they're available. See

http://people.bath.ac.uk/ac886/teaching/2016/algebra2B

There's also a link to this url from the moodle page for MA20217.

Aims of the course: To introduce the students to basic abstract ring theory and provide a thorough structure theory of linear operators on a finite dimensional vector space.

Learning Outcomes: After taking this unit, students should be able to:

- Demonstrate understanding of the basic theory of rings.
- Factorise in various integral domains they have met throughout the course and demonstrate understanding of the general theory.
- State and prove fundamental results on the structure theory of linear operators.
- Apply the structure theory of linear operators in examples. Determine characteristic polynomials, minimal polynomials, geometric and algebraic multiplicities as well as the Jordan normal form for a given linear operator. Calculate generalised eigenspaces

The structure of the unit. The unit is divided into five sections, each lasting roughly two weeks. Each section of the course will be covered in approximately five lectures, leaving one problem class for each section (in addition to your weekly tutorials).

Exercise sheets. These will be given out during the Wednesday lecture of each week. Please submit your solutions by 3pm on Thursday of the following week to the pigeonholes near the lifts on the ground floor of 4W. Tutorials start during the week beginning Mon 8th February. You are not obliged to submit solutions, but please do so anyway!!

The fortnightly problem classes. At each fortnightly problem session (in EB1.1), we'll discuss some exercises to cement your understanding of the new topic. We'll also spend some time learning how to provide sketch proofs. I'll provide complete proofs of the results in lectures, and I'll try to guide you in providing a coherent summary of the big picture of any given proof. This is an invaluable tool for those who plan to take courses in mathematics, especially pure mathematics, at level 3 and beyond.

Books that you might find useful. The lecture notes should guide you through the course. There are also many books that cover some or all of the content, including:

- *A first course in abstract algebra* by John Fraleigh.
- *Linear algebra* by Serge Lang.