MA40188 ALGEBRAIC CURVES 2015/16 SEMESTER 1
BRIEF COURSE INFORMATION

Course Description. This course is an introduction to algebraic geometry. We will study how to use the abstract algebraic language of rings, ideals and fields to describe geometry. Along with developing the theory, we will see lots of examples, with a focus on algebraic curves. As a prerequisite, you need to have taken Algebra 2B (MA20217 or equivalent) before taking this unit. You also need to be comfortable with reading and writing mathematical proofs.

Lecturer. Your lecturer for this unit is Dr. Ziyu Zhang. You can contact me at

zz505@bath.ac.uk

Please feel free to talk to me or send me an email if you have any questions or concerns.

Times and Location. We meet at 10:15 on Mondays, 11:15 and 17:15 on Fridays, all taking place in 3E 2.4. Monday and Friday morning meetings are devoted to introducing new material, while Friday afternoon meetings are exercise classes.

Office Hours. There will be regular office hours every week (from week 2 to week 11). Time and location of office hours will be decided in the first week. I will also provide extra office hours during the revision and assessment weeks.

Course Webpage. Further information about this unit can be found on

http://people.bath.ac.uk/zz505/ma40188/

You can also download lecture notes, exercise sheets and solutions from the course webpage when they become available. Lecture notes of Algebra 2B used in the last two years are also available there for your reference.

Exercise Sheets. An exercise sheet will be given every week and discussed in the exercise class of the following week. You are not obliged but highly welcome to submit your solutions at the end of the exercise class. Every exercise sheet contains four problems, which are usually ordered by difficulty. Try your best and search for help if you get stuck with any problem!

Date: September 21, 2015.

Recommended Texts. The following two books are the most relevant to this course:

- Miles Reid, *Undergraduate algebraic geometry.*
- William Fulton, *Algebraic curves – An introduction to algebraic geometry.*

Most of the topics that will be discussed in this course can be found in both books. Hard copies of both books are available in the university library. Legal electronic version of both books are also available. Links can be found on the course webpage.

Plan of Lectures. This course consists of $3\frac{1}{3}$ parts.

- *Week 1-3:* affine algebraic sets; correspondence between ideals and affine algebraic sets; functions on affine algebraic sets; maps between affine algebraic sets.
- *Week 4-6:* projective algebraic sets; correspondence between ideals and projective algebraic sets; functions on projective algebraic sets; maps between projective algebraic sets.
- *Week 7:* relation between affine and projective theories.
- *Week 8-10:* examples of algebraic curves and algebraic surfaces in low degrees.

Revision classes are planned in week 11. Further details of topics covered in each lecture can be found on the course webpage. This plan is subject to change.

Assessment. Students will be assessed 100% by the exam.