MATH 201H
Honors Mathematics
Conics
Spring 2006
MW 2:30-3:20

Instructor: Jonathan Cox
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*While these are the official office hours, I am available at other times as well. If you want to meet at a time outside of office hours, the best option is to set up an appointment with me. You can also just drop by any time, but you may want to call first to see if I’m there.


Prerequisites. Five hours of Mathematics at the 111 level or higher and admission to the University Honors Program or permission of the University Honors Council.

Catalog Description. A course in the aesthetics of mathematics, including such studies as logic, the history of mathematics, famous impossibilities and unsolved problems.

Specific Description. A study of conic sections starting from the classical Greek descriptions. Classical conics are divided into types including parabolas, ellipses, and hyperbolas. In our journey toward an understanding of the beauty and unity of mathematics, one of our goals is to realize that such distinctions are artificial. If progress permits, the course may culminate with an exploration of the relation between conics and string theory, and of how this relation led to the solution of century-old problems on enumerating conics in the plane. Background material on sets, rubber geometry, linear algebra, trigonometry, and complex numbers will also be included.

Course objectives. The purposes of this course for the student include (1) Improving abstract reasoning, critical thinking, and problem-solving abilities, (2) Understanding that mathematics is not about manipulating symbols or performing rote tasks, (3) Realizing that preconceptions can inhibit understanding of situations and solutions to problems, (4) Learning how to discover, assemble, analyze, and use knowledge, (5) Acquiring an appreciation for the beauty and usefulness of mathematics, and (6) Learning to communicate mathematical ideas, arguments, and results.
Content and Methodology. Sometimes the instructor will lecture. At other times, students will develop and present talks covering certain segments of the text. Class meetings are anticipated to be a forum for students to discuss and debate mathematical ideas. Background material will be covered in about the first five weeks. After that, chapters of the text will be covered at a rate of 1–2 per week, with additional background material covered as necessary. Students are expected to read each chapter prior to its discussion in class.

Homework. Homework will be assigned, collected, and graded regularly. Both routine calculation exercises and in-depth questions that require significant thought will be included.

Due dates for all assignments will be specified, and no late work will receive full credit, except when required by university regulations on absences. (See the Attendance Policy section below.) I define work to be late if it is handed in after the beginning of the class period following the due date. Late work can still be handed in and graded, but will receive credit for only 50% of the points earned. No late work may be handed in after the last day of class or more than one month after the original due date.

Projects. Several writing projects, including two book reviews, will be assigned. There will be at least two projects in addition to the book reviews. Projects might include assembling background histories and working problems of such complexity that they require up to a week (or more) to solve. See the Homework section above for information about turning in assignments.

Grading and Evaluation. Performance in this course will be evaluated on a percentage system. Each of the two book reviews constitutes 10% of the cumulative average, the project average counts for 30%, the in-class presentations make up 20%, participation comprises 5%, and homework (together with any other assignments) contributes the other 25%. (There will be no exams in this course.) In other words, the cumulative average (AVE) will be computed as follows:

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B = \text{Book review average} \\
PJ = \text{Project average} \\
PS = \text{Presentation average} \\
H = \text{Homework average (includes any other assignments)} \\
PT = \text{Participation grade} \\
AVE = .20B + .30PJ + .20PS + .25H + .05PT
\]

Letter grades will be assigned as follows based on a student’s cumulative average (AVE):

- 90 and above: A
- 80-89: B
- 70-79: C
- 60-69: D
- below 60: F

The instructor reserves the right to lower the grade ranges. The grade ranges will not be raised.
**Attendance Policy.** We will follow the attendance policy of the University. (See pp. 44-45 of the 2005–6 ULM catalog.) Failure to attend will adversely affect your participation grade. It is vital that you be present in order to give presentations, contribute to class discussions, etc.. An attendance sheet will be passed around each time the class meets. **It is your responsibility to sign this sheet** each period in order for your attendance to be official.

**Withdrawal Policy.** The drop policy for this course will be that of the University. (See pp. 46-47 of the 2005–6 ULM Catalog.) IT IS YOUR RESPONSIBILITY TO KNOW AND COMPLY WITH ALL DEADLINES. The last day to drop this course or resign from the university with an automatic grade of “W” is **Wednesday, March 29.**

**Academic Dishonesty/Misconduct.** The University has explicit rules governing academic dishonesty and academic misconduct. The policies are detailed in the ULM Catalog under the heading “Academic Cheating and Plagiarism” (pp. 63–65). The university policies will be followed in this class. The minimum penalty for an act of academic dishonesty will be the assignment of a grade of zero on the examination, quiz, or homework assignment.

You are encouraged to work together on homework and in learning the material. While working with another person or in groups is permitted, **all written work submitted must be your own.** Copying someone else’s problem solution or showing your written solution to someone else is prohibited. In order to be successful in meeting the objectives of this course, you need to try to work through the assignments yourself as much as possible before discussing them with anyone else.

**Daily Schedule.** See [http://www.ulm.edu/~jcox/conics/sch.pdf](http://www.ulm.edu/~jcox/conics/sch.pdf) for a *tentative* daily schedule for this course.

**Any changes to this syllabus will be communicated in class by the instructor.**