

Math 01.410 - History of Mathematics

CATALOG DESCRIPTION: This course includes a survey of the development of mathematical ideas from early times up to present day mathematics. Emphasis is on historical mathematical problems and their solution. Readings and reports on selected topics are required.

OBJECTIVES: This course gives students from many different majors the opportunity to see how the growth of mathematical ideas and techniques has evolved. In particular, the historical, religious, economic and philosophical background is shown to play a critical roll in the development of mathematics. This course is especially recommended to future teachers.

CONTENT:

1. Babylonian and Egyptian mathematics,
 2. Greek mathematics: Pythagoras, Euclid, Archimedes, Apollonius
 3. Development of Trigonometry
 4. Development of Algebra
 5. Development of Analytic Geometry
 6. Development of Calculus
 7. Development of Selected Topics of Modern Mathematics: Modern geometries, Modern algebra, Methods of real analysis
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Grading policy:

Distribution	15% - Homework, 15% - Midterm exam, 15% - Final exam, 30% - Expository paper, 25% - Student team lectures and class participation
Cut-offs	A - 90-100%, B - 75-90%, C - 60-75%, D - 50-60%, F - less than 50%

Homework policy:

1. Homework Problems

Homework problems will be assigned weekly. Students should write up solutions to these problems inside a bound notebook. Homework will be collected twice for grading: on the day of the midterm exam and on the day of your final exam. You will be given a scoring sheet to fill out indicating the percentage of problems that you were able to write solutions for. Also, you may be asked to present solutions to selected problems from your homework at the beginning of each class period.

Collaborating: Students are encouraged to collaborate and discuss the homework with each other and with the professor when doing the homework. **However, each student must independently write up his or her own work.** Copying another student's work is strictly prohibited and violates Rowan's policy on academic honesty. Such violations will be reported to

the Dean of Students. Moreover, the students involved will automatically be given an F for a course grade.

2. Expository Paper

Each student must write an end-of-semester term paper on a mathematical topic that discusses its historical as well as its mathematical development. Moreover, the topic must have approval of the instructor. Papers should contain minimally 10 pages of text (assuming 12-point font, one-inch margins, single-spacing, no figures). You will be graded on the clarity of your exposition, your depth of mathematical analysis, your historical coverage of the topic from its earliest beginnings to its current state (including open problems), and the amount of new mathematics that you learned from writing this paper. More details will be given later in the semester.

3. Student Team Lectures and Class Participation

This class will be run more like a seminar where students will be divided into teams of 2 or 3 and each team will take turns giving a half-hour lecture on selected topics from the textbook (assigned one week in advance) on a rotating basis. Approximately three team lectures will be given each class meeting. Moreover, you are expected to participate in class discussions and problem-solving sessions. Also, a different student each class will be asked to tell a 5-10 minute story at the beginning of class about either a mathematician or an event of historical significance and give a brief summary of the mathematics involved. Our last regular class meeting will involve a poster session, where students will present a summary of their expository paper in poster format.

Exams:

- Midterm exam - Wednesday, March 9, 6:30-8pm (tentative), Science Hall 126.
- Final exam - Wednesday, May 4, 6:30-8:30pm (tentative), Science Hall 126.

Attendance policy:

Class attendance is mandatory. Since this class meets only once a week, it is important that you avoid missing class since a large amount of material is covered each week. An attendance sheet will be passed around at the beginning of each class period; please sign next to your printed name on the list. Each student is allowed a total of **two** unexcused absences/tardies (combined); thereafter, the instructor reserves the right to drop a student's course grade by **one** letter. For example, absences due to illness or a family/medical emergency are excused but those due to transportation/scheduling problems are not. Students will only be allowed to make up work for excused absences.

Resources:

- BURTON, D.M., The History of Mathematics, Allyn and Bacon, 5th edition
- EVES, J.H., An Introduction to the History of Mathematics, Saunders, 1990.
- The MacTutor History of Mathematics archive: <http://www-gap.dcs.st-and.ac.uk/~history/>
- Mathematical Resources: History of Mathematics: www.abc.se/~m9847/matre/history.html
- JSTOR: The Scholarly Journal Archive: www.jstor.org/
- *How to Read and Do Proofs: An Introduction to Mathematical Thought Process, Daniel Solow, John-Wiley-and-Sons-Incorporated (1990), ISBN: 0471510041
- *Handbook of Writing for the Mathematical Sciences, Nicholas J. Higham, Society for Industrial & Applied Mathematics (1998), ISBN: 0898714206.