

MTH 484 / MED 584

History of Mathematics

Winter 2006

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Class Sessions: Engineering 220
Wednesdays 6:40pm—9:10pm

Office Hours:
MWTh 5:00pm—6:30pm
or by appointment

Textbook: We will use excerpts taken from articles, books, and internet sites, which will be handed out in class. Students should use a thick three-ring binder to collect the materials as they are distributed throughout the semester.

Course Description: This is a seminar-styled course, where both students and professor give presentations about topics in mathematics history.

Course Outcomes: Students will acquire/develop:

- ∞ a familiarity with the evolution of mathematical thinking, from early number systems up to the development of computers;
- ∞ anecdotal knowledge about numerous mathematical topics;
- ∞ experience solving famous classical problems;
- ∞ the ability to present research before a forum of colleagues.

Grading Scale: The standard 90-80-70-60 grading scale will be used, though the instructor reserves the right to curve test scores up or to lower grading standards.

Under 60	60-66	67-69	70-72	73-76	77-79	80-82	83-86	87-89	90-92	93 and Up
F	D	D+	C-	C	C+	B-	B	B+	A-	A

Make-up / Class Cancellation Policies:

Make-up tests will not be given without a medical or school-related excuse, presented at least 24 hours in advance of the missed class, or at the instructor's discretion. If a class is cancelled due to inclement weather resulting in school closing, or due to instructor absence, then anything planned for that class, including tests and assignment due dates, will be moved to the next class session.

Academic Integrity: Students are expected to conform to a high standard of honesty and integrity. Please refer to the University Catalog and the Student Handbook for further explanation.

Typical Class:

Classes meet once per week for two hour-long (approx.) sessions, back-to-back, with a fifteen minute intermission in between. There will be two movie nights, and in the other classes I'm aiming for a fun and active classroom setting by doing the following:

1. Each normal class begins with a short quiz about a topic or math problem from the previous class, and then a class forum on their reading assignment from the textbook. This reading assignment will be articles on math history or the use of math history in teaching math at the K-12 or college level. For each assignment, students will turn in a page-long report.
2. For the remainder of the first session, there will be short presentations, *by students*, on some additional, tangential reading related to the previous classes' material. Each undergraduate student in the class must give at least one such presentation during the semester -- grad students must give two. Bonus points will be awarded for students whose presentations come early in the semester (a reward for bravery).
3. After the intermission, the professor will present some topics in math history (schedule of topics given later), punctuated often with fun and interesting hands-on activities regarding famous problems and theorems.

Tests and the Final / Quizzes / Papers / Homework:

There will be no long tests or Final Exam.

At the beginning of each class will be a very short quiz, about 15 to 20 minutes in length, maximum. This is mostly done as a way of keeping attendance. There will be no make-ups, and students arriving late will not be allowed to take the missed quiz.

There will be two papers of about 1500 words length due during the semester.

The homework for every normal class comes in two parts. The first part is a page-length journal entry about a reading assignment from the textbook. Students should also be prepared to engage in a lively class forum, discussing the article(s) and any related thoughts it might inspire. The second part of the homework is a set of problems or puzzles to be worked out, sometimes with a particular historical technique. The next class' quiz will be based on these problems or puzzles.

Determination of Grade:

	<u>MTH 484</u>	<u>MED 584</u>
Quizzes	20 %	15 %
Journals	20 %	15 %
Presentation #1	20 %	15 %
Presentation #2	-----	15 %
Paper #1	20 %	20 %
Paper #2	20 %	20 %

Student Presentations

These will be of 10-15 minutes length. The student will present before the class, using overhead transparencies and hand-outs as appropriate. The topic of their presentation will be selected from a list, and announced in class at least one week ahead of time.

These presentations will be graded by fellow students. Each student in the audience will grade the presenter from 3 to 10 based on three scales :

Presenter kept presentation on topic? scaled 1-3

Presentation was clear, good use of materials? scaled 1-3

Did I learn from it? scaled 1-4

The highest and lowest scores will be thrown out, and the rest will be scaled to 100%. Bonus points will be awarded by the instructor for presentations given earlier in the semester, and may be awarded for creativity or for exceptional depth of research.

Class Topic Schedule:

JANUARY – The Dawn of Mathematics

1/11 -- Early Number Systems and Ancient Number Games

1/18 -- Early Arithmetic, such as Babylonian Multiplication and Egyptian Fractions

1/25 -- Later Formalizations of Arithmetic

FEBRUARY – Cultural Awareness in Mathematics – Paper #1 will be about a famous

African-American mathematician

2/01 -- Ancient Greece: Melting Pot of Ancient Science

2/08 -- Contributions of Early Chinese Mathematics

2/15 -- Indian Mathematics: Substance from Nothingness

2/22 -- The Middle East: Birthplace of Algebra

MARCH – Mathematics Evolves – Paper #2 will be about a famous woman mathematician

3/01 -- *MOVIE NIGHT: " π "* – **Paper #1 Due**

3/15 -- The Renaissance and Early European Universities

3/22 -- Probability Theory: Transcending the Need for Certainty

3/29 -- From Topology to Non-Euclidean Geometry: Mathematics Beyond Numbers

APRIL – Mathematics Expands our Awareness

4/05 -- The Continuum Hypothesis and the Transfinite Numbers

4/12 -- *MOVIE NIGHT: " Mindwalk "* – **Paper #2 Due**

4/19 -- The Computer Revolution and the Future of Mathematics