

Math History MWF 2:00-2:50PM Fall 2021 SH 205

- Instructor: Jonathan White, jwhite@coe.edu
- Chair: Gavin Cross, gcross@coe.edu
- Web Page: public.coe.edu/~jwhite
- Office: Stuart 311
- Office Hours: (Zoom link on web page) 9:30-9:50am TTTh, 11:00-11:30am MWF, and by appointment
- Office Phone: 319-399-8280
- Text: *Math Through the Ages: A Gentle History for Teachers and Others*, Berlinghoff and Gouvea
- Quests: There will be several quests (a mix between a quiz and a test) during the semester. Most will allow for retries until successful, but with diminishing credit; details will be specified on each assignment. Combined these will be worth 300 points.
- Math Culture Points: Math Culture Points will constitute 100 points. These will be earned through participation in various activities outside of class, as detailed on the third page of this syllabus.
- Projects: Students will undertake three major projects during the semester, which will normally include a paper of at least 3-5 page length. Topics will be selected in consultation with the instructor, with considerable freedom to fit individual interests within the scope of the class. Projects will be worth 100 points each, and can be revised for more credit where appropriate. At least one project must be completed by the end of the sixth week and a second by the end of the tenth week of the term.
- Grading: Grading will approximately follow a [92.0%, 4) \mapsto A, [90%, 92%) \mapsto A-, [87%, 90%) \mapsto B+, [82%, 87%) \mapsto B, [80%, 82%) \mapsto B-, [77%, 80%) \mapsto C+, [72%, 77%) \mapsto C, [70%, 72%) \mapsto C-, [67%, 70%) \mapsto D+, [62%, 67%) \mapsto D, [60%, 62%) \mapsto D-, ($-\infty$, 60%) \mapsto F scale. Current grade information will be available online through Moodle at all times.
- Makeups: For the sake of fairness to those who follow the schedule, makeups for exams will be allowed only under extenuating circumstances, with documentation and advance notice when humanly possible. Late problem sets and quizzes will generally not be accepted, and if accepted due to extenuating circumstances will generally be subject to a penalty of 20% of the possible points for each day past due. Late WeBWorK will generally not be accepted.

Mathematics is sometimes conceived of as a body of timeless truths, but in fact all human knowledge of mathematics has been gained in stages, often haltingly, and often for reasons different from those we care about now. This class will attempt to balance learning about past conceptions of mathematical material with a broader understanding of the context within which that knowledge was developed.

This class is considerably different from others in the department. The material is different, the assignments are different, and the assessment is different. You will have considerably more freedom to pursue topics of your own interest, but also be pushed to hold yourself to a high standard in that pursuit. The degree to which this class is different will likely result in some disorientation, confusion, and frustration. If at some point the challenges or frustrations of this class get too bad, I strongly encourage you to see me for extra explanation – don't wait until you're overwhelmed. I'm here to help.

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	8/18 Beginnings	8/20 Greek Mathematics
8/23 Meanwhile, in India	8/25 Arabic Mathematics	8/27 Medieval Europe
8/30 §12.6 Quadric Surfaces	9/1 15th & 16th Centuries	9/3 Algebra Comes of Age
9/6 No Class -- Labor Day	9/8 Calculus & Applied Mathematics	9/10 Rigor & Professionalism
9/13 Abstraction, Computers, & New App.	9/15 Mathematics Today	9/17 Keeping Count
9/20 Reading & Writing	9/22 Nothing Becomes a Number	9/24 Broken Numbers
9/27 Something Less than Nothing?	9/29 By Tens and Tenths	10/1 Measuring the Circle
10/4 The Cossic Art	10/6 Linear Thinking	10/8 No Class -- Fall Break
10/11 A Square & Things	10/13 Intrigue in Renaissance Italy	10/15 A Cheerful Fact
10/18 A Marvelous Proof	10/20 On Beauty Bare	10/22 In Perfect Shape
10/25 Shapes by the Numbers	10/27 Impossible, Imaginary, Useful	10/29 Half is Better
11/1 Strange New Worlds	11/3 In the Eye of the Beholder	11/5 What's in a Game?
11/8 Making Sense of Data	11/10 Machines That Think?	11/12 The Arithmetic of Reasoning
11/15 Beyond Counting	11/17 Out of the Shadows	11/19 Counting Ratios
No Class -- Thanksgiving Break		
11/29 Any Way You Slice It	12/1 Beyond the Pale	12/3 Barely Touching
Ultimate Quest -- 2pm on Tuesday 12/7		

Any students with disabilities which might affect their performance in this class should contact me as soon as possible to arrange accommodations.

Coe's faculty has adopted an academic integrity policy. It is your responsibility to understand and follow it.

Diversity, in all its forms, is valuable.

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Math Culture Points

A portion of the grade for this course will take the form of Math Culture Points. These will be earned through activities outside of class including, but not necessarily limited to, those listed below:

Activity	Points	Max #
Colloquium Attendance	5	--
Colloquium Presentation	5-15	2
Conference Attendance Midwest Sports Analytics Meeting?	5-15 15	2
Mathematics Competition Participation Putnam Exam	15	2
Math Culture Reading Specific readings will be posted, typically around 6 each semester Any article from Math Horizons With approval, any relevant article from Math Magazine, CMJ, etc. A mathematical biography (selected in consultation with Jon)	5 50	-- 3 3 1
Math Club Activities (when appropriate) Movies, Math Club portion of the Playground of Science, Speakers, Workshops, etc.	5	--
Other Appropriate Coe or Outreach Activities Chess Club Meeting Job Shadowing in any relevant field Other Volunteer Outreach (Garfield, McKinley, etc. – talk to Jon for information!)	5 10 5	3 1 4

You should plan to spread your participation throughout the semester. In each case above, credit assumes both full participation and posting a brief summary/response on Moodle **in a timely manner**. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event, and **must be submitted within one week of the event**, or within the specified time window for other activities. Up to three units of credit may be submitted after normal deadlines in the “Math Culture – Late” category on Moodle, but otherwise exceptions will not be made without serious extenuating circumstances.

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Learning Outcomes

By the end of this class each student should be able to demonstrate:

- understanding of limits and continuity of multivariable functions.
- understanding of derivatives of multivariable functions.
- understanding of multiple integrals.
- understanding of vector calculus, including generalizations of the Fundamental Theorem of Calculus.
- understanding of selected applications of the above concepts.

The Provost has mandated that the material below this line appear on all syllabi:

Mission Statement:

Coe College is a national, residential liberal arts college offering a broad array of programs in the arts, sciences, and professions. Our mission is to prepare students for meaningful lives and fulfilling careers in a diverse, interconnected world. Coe's success will be judged by the success of our graduates.

Academic Integrity

At Coe College, we expect academic integrity of all members of our community. Academic integrity assumes honesty about the nature of one's work in all situations. Such honesty is at the heart of the educational enterprise and is a precondition for intellectual growth. Academic dishonesty is the willful attempt to misrepresent one's work, cheat, plagiarize, or impede other students' academic progress. Academic dishonesty interferes with the mission of the College and will be treated with the utmost seriousness as a violation of community standards. Please refer to the Coe College Academic Catalog for complete information regarding Academic Integrity:

www.coe.edu/academics/academic-resources/provosts-office/academic-integrity-policy

FERPA

Students should be aware of their rights regarding the privacy of their educational records. Detailed information about your rights can be found under the FERPA (Family Educational Rights and Privacy Act of 1974) section in the Academic Catalog and online here: <https://www.coe.edu/academics/academic-resources/registrar/ferpa>

In line with FERPA restrictions, students should be aware that an instructor cannot

publicly post grades by student name, institutional student identification number, or social security number without first having obtained students' written permission.

The Definition of a Course Credit & Expected Workload

One course credit at Coe College constitutes 180 hours' worth of student work over the course of the term. "The Department of Education has defined one hour to be 50 minutes, so 150 60-minute hours is equivalent to 180 50-minute hours." This figure includes both the time spent in class and out of class completing course work. In other words, students are expected to devote a considerable amount of time outside of class to this course. For courses that meet in a standard MWF or T-Th slot, students should be expected to work seven hours a week outside of the three hours in class.

Requesting Academic Accommodations

Coe College is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning in this course, please visit my office hours to discuss these concerns with me. If you have a medical, physical, psychological, or learning need documented by a healthcare provider, or experience an unforeseen obstacle during the semester, you can make an appointment with Laura Hayes, Accessibility Services Coordinator, to request an official accommodation under the Americans with Disabilities Act. You can find more information about the Accessibility Services Office by visiting the Learning Commons website or by emailing accessibility@coe.edu. If you have already been approved for accommodations through Accessibility Services, please meet with me so we can develop a plan for your success together.

Reporting of Sexual Assault or Misconduct

As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a faculty member. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in any one-on-one meetings. I will keep the information you share with me private to the greatest extent possible. However, I am required to share information regarding sexual misconduct or students who may be in danger to themselves or to others. Students may speak to someone confidentially by contacting Student Life at 319-399-8843 or emailing titleix@coe.edu, Safety, and Security at 319-399-8888, Emily Barnard (college counselor) at 319-399-8843, or visit Coe's Title IX website for more information.