



Dr. Charles Rocca
Higgins Hall 101D
roccac@wcsu.edu
<http://sites.wcsu.edu/roccac>

MAT 429/529 - 71: History of Math
On Ground: Higgins 104, T 5:30-8pm
Credits: 3 credit
Grading: Standard A-F



Office Hours:

Office hours are on ground for the Spring 2024 Semester. If you need to meet virtually we can make an appointment to do so via my WebEx Virtual Office:

Higgins 101-DV (<https://wcsu.webex.com/meet/roccac>)

- Monday, Tuesday, Thursday, & Friday: 12:45pm - 1:45pm
- Tuesday & Thursday: 3:30pm - 4:30pm
- or by appointment

Course Materials:

- “*A History of Mathematics: An Introduction, 3rd ed.*” by Victor J. Katz

Course Description:

In this course we will examine significant moments in the development of key areas of mathematics. Particular emphasis will be placed on understanding contributions from a variety of cultures and time periods, as well as from significant individuals.

Student Learning Outcomes:

After successful completion of this course students will be able to:

- Demonstrate a solid historical perspective on the development of mathematics.
- Highlight how different cultures have approached mathematics, in particular contrasting western (Hellenistic) and non-western heritage.
- Demonstrate knowledge of the lives and contributions of some mathematicians.
- Carry out computations, proofs, or analyses in a way that is historically accurate for a past time.

Additionally, graduate students are expected to be able to:

- Demonstrate in-depth knowledge of the lives and contributions of some particular mathematician.
- Explain clearly in writing how some particular topic in mathematics has changed over time.
- Independently develop knowledge of the evolution of a particular mathematical concept.

Course Content:

The content listed below represents what we will be covering in class and what you will be tested on for each unit. Please note that you must watch the videos on your own time and read sections mark with an asterisk, *, on your own.

Unit 1: Pre-History Through Ancient Greece

- Video: [The Story of 1](#)
- Video: [The Story of Maths: The Language of the Universe](#)
- Text Sections: 1.1, 1.2, 2.1*, 3.1*, 3.2, 3.6, 3.7, 3.8, 4.2, 5.3, 6.4*
- Assignment: p.28 - 25, p.47 - 13 & 17, p.90 - 7 & 36, p.168 - 28 & 29

Unit 2: Mathematics in the Middle Ages

- Video: [The Story of Maths: The Genius of the East](#)
- Text Sections: 7.1*, 7.2, 7.3, 7.5, 7.6*, 8.1*, 8.5, 8.7, 8.8*, 9.1*, 9.3, 9.4, 9.7*, 10.1*, 10.2, 10.4, 11.1*, 11.2*
- Assignment: p.226 - 14 & 18, p.261 - 26 & 30, p.318 - 12, p.359 - 19

Unit 3: Early Modern Mathematics

- Video: [The Story of Maths: The Frontiers of Space](#)
- Text Sections: 12.1, 12.2, 12.3, 13.1, 13.2, 13.3, 14.2, 14.4, 15.1, 16.1, 16.2
- Assignment: p.418 - 30, p.462 - 1 & 2, p.501 - 16, p.539 - 3, 10, p. 579 - 25

Unit 4: Modern Mathematics

- Video: [The Story of Maths: To Infinity and Beyond](#)
- Text Sections: 18.1, 18.3, 19.2, 19.3, 19.4*, 20.2, 20.4, 20.5*, 21.1, 21.2, 22.2, 24.6, 25.1, 25.2
- Assignment: TBA

Grading:

<u>Assignment</u>	<u>Undergraduate</u>	<u>Graduate</u>
Unit Exams	60%	60%
Exploration Packets	20%	13%
Text Assignments	20%	12%
Original Source Project	10% (Optional)	15%
Total	110%	100%

Exams: At the end of each unit you will have an exam to check your comprehension of the material we covered in class as well as material from the out of class readings and videos. On exam days we will split the class into half review and half exam. For the review you are expected to come prepared with questions.

Exploration Packets: During many classes we will work on packets of exercises to help you engage with the material you are learning. You need to complete these prior to the next class.

Text Assignments: For each unit you will have 5 to 7 problems from the text that you will need to complete and write up. The problems are listed above, additional details will be on the website. Final submissions for all of your out of class assignments must:

- be typed with 12pt font,
- have 1 inch margins on the top, bottom, left, and right,
- be double spaced,
- be written in complete sentences,
- adhere to standard English conventions for writing, and
- adhere to standard conventions for properly typed mathematics.

Original Source Essay: The graduate students in the class must complete research project of around 5000 words (about 20 pages double spaced). This project will explore the evolution of a particular topic throughout history and include substantial biographical information on at least one individual who contributed significantly to the topic. The final project will be due at the end of the semester, but bibliographies, outlines, and rough drafts will be due earlier. Undergraduates may complete this essay for +10% extra credit. Specific details will be posted separately.

- 2/13/2024: Choose Topic
- 3/5/2024: Submit notes on Original Source
- 4/2/2024: Submit Outline & Bibliography
- 4/16/2024: Submit Rough Draft
- 5/10/2024 by 3pm: Submit Final Draft

Course Calendar:

TUESDAY	
1/23 Syl., Intro., Number Systems, & Egyptian Mathematics	1
1/30 Euclid's Elements to Archimedes	2
2/6 Archimedes to the Later Hellenistic Age	3
2/13 <i>Review and Unit 1 Exam & Topic Choice</i>	4
2/20 Mathematics in China & <i>Unit 1 Text Assignment is Due</i>	5
2/27 Mathematics in India	6
3/5 The Islamic World, Early Modern Europe and Leonardo of Pisa & <i>O.S. Notes</i>	7
3/12 <i>Spring Break - No Class</i>	
3/19 <i>Review and Unit 2 Exam</i>	8
3/26 Cardano and the Cubic & <i>Unit 2 Text Assignment is Due</i>	9
4/2 Renaissance to the Seventeenth Century & <i>Outline & Bib.</i>	10
4/9 Some History of Calculus	11
4/16 <i>Review and Unit 3 Exam & Rough Draft</i>	12
4/23 Algebra and Analysis & <i>Unit 3 Text Assignment is Due</i>	13
4/30 Set Theory and Topology	14
5/7 <i>Review and Unit 4 Exam at 5:30pm</i>	15

The Unit 4 Text Assignment is Due by 5/10/2024 at 3pm

The Original Source Project is Due by 5/10/2024 at 3pm

You and Your Grades:

- “A” (Exceptional) range 90% to 100%:

The student has demonstrated significant mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve standard formulaic exercises and most nonstandard problems which require deeper insight.

- “A” $\iff 92.5\% \leq \textit{Grade} \leq 100\%$

- “A-” $\iff 90\% \leq \textit{Grade} < 92.5\%$

- “B” (Good) range 80% to 90%:

The student has demonstrated mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve standard formulaic exercises and some nonstandard problems which require deeper insight.

- “B+” $\iff 87.5\% \leq \textit{Grade} < 90\%$

- “B” $\iff 82.5\% \leq \textit{Grade} < 87.5\%$

- “B-” $\iff 80\% \leq \textit{Grade} < 82.5\%$

- “C” (Adequate) range 70% to 80%:

The student has demonstrated adequate mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve most standard formulaic exercises but struggles with nonstandard problems which require deeper insight.

- “C+” $\iff 77.5\% \leq \textit{Grade} < 80\%$

- “C” $\iff 72.5\% \leq \textit{Grade} < 77.5\%$

- “C-” $\iff 70\% \leq \textit{Grade} < 72.5\%$

- “D” (Inadequate) range 60% to 70%:

The student has demonstrated inadequate or incomplete mastery of the appropriate knowledge and skills relevant to the course. The student is able to solve some standard formulaic exercises but few if any nonstandard problems which require deeper insight.

- “D+” $\iff 67.5\% \leq \textit{Grade} < 70\%$

- “D” $\iff 62.5\% \leq \textit{Grade} < 67.5\%$

- “D-” $\iff 60\% \leq \textit{Grade} < 62.5\%$

- “F” (Unacceptable) below 60%:

The student has demonstrated essentially no mastery of the appropriate knowledge and skills relevant to the course. The student is unable to solve most standard formulaic exercises and essentially no nonstandard problems which require deeper insight.

End User Agreement:

General Expectations: As a student in this class you are expected to:

- attend class and take notes,
- actively read material in each section, taking notes,
- review your notes on a regular basis,
- check your university email every day,
- check the class site *at least* every other day,
- begin studying for exams in a timely fashion,
- ask questions early and often,
- attend office hours,
- seek help in the math clinic or tutoring center, and
- complete assignments and readings on time.

Assignment Guidelines: (These apply to *all out of class work*.)

- Work handed in must always look neat, legible, and professional. Work must be very neatly written or preferably typed. The quality of your work will be factored into your grade, up to 10%, in extreme cases work may be rejected and then counted as late.
- Answers on all assignments should be given in complete sentences. I should be able to tell what your answer means without re-reading the problem. This does not mean you simply rewrite the question.
- An assignment is considered late after I have handed it back or gone over it in class. Late assignments are accepted but may receive at most 75% credit. Late assignments go to the absolute bottom of the stack of papers to be graded; *all on time work is graded before any late work*.
- If you work on an assignment as part of a group, then there may be no more than three individuals in the group and all your names must be on the assignment. You should hand in only one copy of the work.
- All work must be submitted in the manner directed.

Email Etiquette Guidelines: When sending an email you must include the course number and semester in the subject line. For example, if you are taking MAT 314 in Fall 1592 then the the subject line should begin with “[MAT 314 Fall 1592].” Also, you should always begin with a salutation such as “Dear Dr. Rocca” and end with a closing such as “Sincerely, I. Newton.”

Exam Makeup Policy: To qualify for a makeup exam you must have a valid reason for missing the exam and, if at all possible, let me know ahead of time that you are missing the exam. You will need to meet with me in order to arrange a time for the make up exam. If you do not have a valid reason, do not give prior notice when possible, or simply do not show up for an exam, you are not entitled to a makeup and will not be given one. If you fail to show up for your makeup exam, you will not be given a second opportunity.

The 2% Exception: Any quiz or class work which is ultimately worth no more then 2% of your final grade can not be made up.

Time on Task: As a 3 credit class you should expect to average 7.5 to 8.5 hours of work a week including class time. Some weeks you may get away with less and some may require more.

Attendance: There is no specific policy for attendance in this course. However, if you have *three consecutive unexcused absences* within the first half of the semester I am required to report to the University that you have *stopped attending*.

Academic Honesty: If on any assignment, quiz, or exam you turn in someone else’s work, regardless of the source, as if it were your own you will receive a zero on that assignment, quiz, or exam. If you are caught doing this three times you will receive an F in the course and the Dean will be informed of your academic dishonesty.

(<https://www.wcsu.edu/faculty-handbook/2019-2020/policies-pertaining-to-students/academic-honesty-policy/>)

Accommodations: If you have need of an accommodation for testing or note taking, please visit AccessAbility Services, located in the HAAS Library room 406 (<http://www.wcsu.edu/accessability>).