

History of Mathematics
MAT 4930
Spring 2024

Classroom: LIT219

Meeting Times: MWF6

Instructor: Dr. Konstantina Christododouloupoulou

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Office Location: LIT 365

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Office Hours: M4, W5, F3 and by appointment.

Open Door Policy: You are welcome to drop by to discuss any aspect of the course, anytime.

All course materials will be posted in e-Learning Canvas

All course materials will be posted in eLearning Canvas, <http://elearning.ufl.edu/>.

Text: There is no required textbook. All texts and readings will be available in Canvas or accessed through the UF libraries.

Course content and objectives: The goal of the course is to expose students to the historical development of mathematical ideas, over time and across cultures, and to acquaint them with some of the basic techniques, as they were historically developed. We will emphasize primarily the mathematics that influenced the development of algebra, geometry, calculus, and (if time permits) we will look into selected topics from contemporary mathematics. This course should also allow students to create a cohesive picture of mathematics, develop an understanding of the global nature of mathematical culture, and the importance of cultural interactions in mathematical history; and reflect on contemporary mathematical culture, their place in it, and their mathematical values.

Course Web Page: I will update Canvas regularly with class announcements, homework assignments, and additional materials. All grades are posted in the Canvas grade book. You are responsible for verifying that those grades are accurate. **You have one week after a score has been posted to contact me to resolve any grade concerns. We will not consider any grading disputes nor make any grade adjustments at the end of the semester.**

Please review the UF Resources and Policies for available technical assistance, resources and UF policies.

Grading:

Attendance & Participation	10%
Homework	20%
Midterm Exam	25%
Presentation	10%
Term Paper Proposal	5%
Term Paper Draft Submission & Peer Review	5%
Term Paper	25%

The following grading scale applies.

A	$\geq 90\%$	C	$\geq 70\%$
A-	$\geq 87\%$	C-	$\geq 67\%$
B+	$\geq 84\%$	D+	$\geq 64\%$
B	$\geq 80\%$	D	$\geq 60\%$
B-	$\geq 77\%$	D-	$\geq 56\%$
C+	$\geq 74\%$	E	$< 56\%$

The current UF grading policies for assigning grade points is available here: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Grades will not be rounded and extra assignments for individual students to improve a grade are NOT possible. We will not review disputed points at the end of the semester. All grade concerns must be settled within one week of the submission.

Homework: Homework will be assigned regularly and it will consist of advanced reading assignments, warm-up exercises to discuss and/or present in class, and main exercises assigned after we have covered new material. Details will be posted in Canvas. I expect all homework solutions to be written in full sentences and to be grammatically correct. Each mathematical exercise will be graded on the following scale:

5	Correct mathematical solution and very well written.
4	Small errors such as incomplete sentences, abbreviating words, imprecise definitions, or overlooking trivial cases.
3	Contains an outline of a correct solution and several steps toward this solution, but the writing is unclear or there are gaps in the solution.
2	Some original steps toward a correct solution but with significant mathematical errors.
1	No original steps toward a correct solution.

You may work with your peers to prepare problems but you must write up solutions individually. Do not turn in what are essentially Xerox copies of each other's homework.

Term Paper: You will choose a mathematical topic to research and complete a paper. The paper should be of length 6-12 pages (without cover sheet or references) typeset using LaTeX (12pt). The main requirement is that your paper must involve a "great idea" or a "great theorem" of mathematics, so it should be about mathematics. The other main requirements are that you should be able to provide a well-supported argument justifying this choice of topic in your topic proposal and discuss the mathematics in your paper with some genuine understanding of it. All papers are expected to be well-written, free from grammatical errors, and have excellent mathematical depth and style. More details and a grading rubric will be provided early in the semester.

- You should direct a significant portion of your paper toward a general university audience and articulate clearly which sections are aimed toward experts.

- You will turn in a first version of your paper for peer review; the first version must be a complete paper that you will revise to create your final version.

Presentation: Towards the end of the semester, you will give a short presentation of your paper to the whole class. Presentations will be evaluated on mathematical content, style, clarity, and organization. Students are expected to attend all presentations and complete a short summary after each presentation. More details will be provided in Canvas.

Participation: You are expected to participate in class discussions. Therefore, *it is absolutely essential that you attend class*. Excused absences are consistent with university policies in the undergraduate catalog <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> and require appropriate documentation.

I believe that participation during class is crucial, and it constitutes an important avenue for learning. I encourage you to be active in every class session. Class Participation will be evaluated using the rubric below. This Participation Grading Rubric covers expectations for individual contributions in all class discussions and smaller group discussions. Note: I understand that we all have different levels of comfort regarding speaking in class. If you have any issues that prohibit you from participating in class, I encourage you to contact me as early as possible so we can find ways to make participation work for you in this class.

Participation Grading Rubric

	High Quality	Average	Needs Improvement
Informed: Shows evidence of having done the assigned work (40 %)	Student contributes often in class to discuss the assigned work in relation to the topics discussed (4 points)	Student contributes occasionally in class to discuss the assigned work in relation to the topics discussed (3 points)	Student contributes rarely in class to discuss the assigned work in relation to the topics discussed (1-2 points)
Thoughtful: Shows evidence of having understood and considered issues raised (30 %)	Student contributes often in class to discuss readings and ideas, in relation to the topics discussed (3 points)	Student contributes occasionally in class to discuss readings and ideas, in relation to the topics discussed. (2 points)	Student contributes rarely in class to discuss readings and ideas, in relation to the topics discussed (1 point)
Considerate: Takes the perspective of others into account. (30 %)	Student almost always listens to the ideas of others and incorporates them into their own perspectives (3 points)	Student usually listens to the ideas of others and incorporates them into their own perspectives (2 points)	Student rarely or never listens to the ideas of others (1 point)

Submitted work expectations: Submitted assignments should be neat, organized, and clearly presented. Submissions not meeting these standards may have the scores reduced or may be returned ungraded.

Excused absences are consistent with university policies in the undergraduate catalog <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> and require appropriate documentation.

Midterm Exam: The midterm exam is tentatively scheduled for Friday, March 1st; the exam will be in-person during our regular class and it will contain a mixture of mathematical exercises and short answer historical questions. **The exam cannot be rescheduled unless you meet the University requirements; see <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.** Absolutely no collaboration on the exam is allowed.

Make-up policies: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Make-up assignments will be allowed in the following cases:

- In case of illness, upon receipt of a medical excuse note or equivalent, or by following the procedure outlined here: <https://care.dso.ufl.edu/instructor-notifications>.
- In case of religious holidays, by informing me via e-mail ahead of time.
- In case of military duty, jury duty, participation in academic conferences, or participation in official university or UAA events, by providing appropriate evidence ahead of time.
- In case of family emergencies or other extenuating circumstances, by following the procedure outlined here: <https://care.dso.ufl.edu/instructor-notifications>.

In all other cases, or if you are unsure, please email me as soon as feasible. Absences are generally not excused for non-emergency travel and personal schedule conflicts. Students are still responsible for submitting assignments on time unless an extension has been requested via email and approved by the instructor prior to the deadline. In case of true documented emergencies, the instructor will waive this requirement.

Technical difficulties are not generally an excuse for missing an assessment or assignment; students should have contingency plans in case any such issues arise.

Incomplete: A student who has completed a major portion of the course with a passing grade but is unable to complete the final exam or other course requirements due to illness or emergency may be granted an incomplete, indicated by a grade of "I". This allows the student to complete the course within the first six weeks of the following semester. You must contact me before the final exam to sign an incomplete grade contract (<https://math.ufl.edu/wp-content/uploads/sites/124/incomplete-grade-contract.pdf>) and you must provide documentation of the extenuating circumstances preventing you from taking the final exam. The grade of "I" is never used to avoid an undesirable grade, and does not allow a student to redo work already graded or to retake the course. See the official policy at <http://www.math.ufl.edu/departments/incomplete-grades/>.

Students with Disabilities: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Academic Honesty: UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code." On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class.

Online Course Evaluation: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students here: <https://gatorevals.aa.ufl.edu/public-results/>.

Campus Resources:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit <https://umatter.ufl.edu/> to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit <https://counseling.ufl.edu/> or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit <https://shcc.ufl.edu/>.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

MAT 4930 History of Mathematics Calendar

The actual pace of the course may be slightly different than listed in the syllabus below. It will depend on the students' response to the material. **Homework and readings will be assigned regularly.** Handouts, Lecture Notes, etc. are posted in Canvas. Below we will denote by: Stillwell = Mathematics and Its History (can be accessed through UF's library), MTM = [The MacTutor History of Mathematics Archives](#), All readings will be accessible online through the UF Library and/or in Canvas. **Please check Canvas regularly for updates.**

	Topics	Readings/Assignments
Week 1	Ancient Arithmetic Egyptian Mathematics Babylonian Mathematics	MTM: Overview of the history of mathematics MTM: Egyptian Mathematics MTM: Babylonian Mathematics
Week 2	Greek Mathematics Overview: Plato and Aristotle Euclid's Elements, The Pythagorean Theorem, Irrational Numbers	MTM: Greek Mathematics Sources Stillwell: Chapter 1 Homework
Week 3	Ruler and Compass Constructions, Polygonal, Prime, and Perfect Numbers, the Euclidean Algorithm, Pell's Equation	MTM: How do we know about Greek Mathematics? Stillwell: Chapters 2-3 Homework
Week 4	Infinity in Greek Mathematics, Archimedes, Ptolemy and Astronomy, Diophantus	Stillwell: Chapter 4 Homework
Week 5	Mathematics in India and China	MTM: An overview of Indian and Chinese Mathematics Stillwell: Chapter 5, 6.1-6.3, 11.1 Homework Term Paper Proposal Due
Week 6	Mathematics in the Islamic World, the Mathematical Awakening of Europe, the Renaissance	Stillwell: 6.5, Chapter 8 MTM: Cardano, Tartaglia Homework
Week 7	Cubics and Quartics in 16th-century Italy, Bombelli and Viète, European Mathematics in the Early 17 th -century	Stillwell: 6.5-6.8, Chapter 7 MTM: Fermat, Descartes, Abel, Galois Homework
Week 8	Calculus	Stillwell: Chapter 9 MTM: Wallis, Newton, Leibniz Homework
Week 9	Infinite Series Midterm Exam	Stillwell: 10.1, 10.2, 10.4, 10.8 MTM: Euler Homework Draft Version of Term-Paper Due
Week 10	Spring Break/No Class	
Week 11	Non-Euclidean Geometry	Stillwell: Chapter 18 Homework
Week 12	The Rigorization of Analysis	Who Gave you the Epsilon? And Other Tales of Mathematical History, edited by Marlow Anderson, et al., American Mathematical Society, 2009, pp. 5-14, available online through UF's Library. Homework
Week 13	Hypercomplex Numbers (time permitting)/Class Presentations	Stillwell: Chapter 20 Peer Review Due
Week 14	Sets, Logic, and Computations Class (time permitting) Presentations	Stillwell: Chapter 24 Homework
Week 15	Class Presentations	
Week 16	Class Presentations	Term Paper due