



### Course Instructor

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**Instructor:** Dr. Marge Murray

**Campus Address:** 172 EPB

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**Email:** [margaret-a-murray@uiowa.edu](mailto:margaret-a-murray@uiowa.edu)

**Office Hours:** Wednesday 10:45–11:45am via Zoom, by appointment, or via email

### Class Meeting Times

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This course is self-paced within a structure of scheduled course work. Students will progress through the course as a cohort and will complete and submit course work online. There are no required scheduled (online) class meetings.

### Prerequisites

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MATH:1850 and MATH:1860 (or equivalent: one year of calculus) and MATH:2700 (linear algebra); or consent of instructor.

### Course Description and Goals

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In this course, we study the development of mathematical knowledge from ancient times to the present. We will focus, in particular, on the origin and development of the mathematics with which you are already familiar. Because many of these subjects are central to the elementary and secondary mathematics curriculum, their history should be of particular interest to current or prospective mathematics teachers. But we will also explore new areas of mathematics that you may not have encountered before. The course is intended to help you:

- Describe the origins and development of core mathematical subjects such as number systems, arithmetic, geometry, algebra, and calculus.
- Understand that mathematics is not created in a vacuum, but is done by real people, living under particular social, historical, political, and personal conditions.
- Explain how problems arising in science, technology, and mathematics itself give rise to new mathematical ideas and branches of study.

The course meets the following degree requirements:

- **BLS/BAS Areas:** (Upper Level) Natural Science and Math

This course should be of particular interest to undergraduate and graduate students majoring in mathematics, mathematics education, the sciences, and engineering, as well as students majoring in history, philosophy, and other disciplines who have the appropriate mathematics background.

### Department

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College of Liberal Arts and Sciences

Department of Mathematics

<https://math.uiowa.edu/>

**Chair (DEO):** Dr. Ryan Kinser

**Email:** [ryan-kinser@uiowa.edu](mailto:ryan-kinser@uiowa.edu)

### Course Site

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To access the course site, log into Iowa Courses Online (ICON) using your Hawk ID and password.

<http://icon.uiowa.edu/index.shtml>

## Media/System Requirements

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Sufficient technology and internet access are required to complete online classes when you take a course at The University of Iowa. While tablets, smartphones, and other mobile devices may allow for some completion of coursework, they are not guaranteed to work in all areas. Please ensure you have a Windows or Mac based computer available to complete coursework in the event your selected mobile device does not meet the needs of the course.

Here are the specific media/system requirements applicable to this course:

- **Student-provided personal computer** (Windows or Mac).
- **Computer with reliable Internet access.** A wired Ethernet connection to the internet is very strongly recommended. Wireless and cellphone data connections may experience connection problems. Android and iOS operating systems are not fully supported at this time. For specific requirements, go to the [Distance and Online Education Support Page](#) and click on **Technical Requirements/Download Page**.

Students who need assistive technologies will have different computer and technology requirements. Please check with [Student Disability Services](#) to determine the requirements for the specific technologies needed to support your online classes.

For questions regarding virtual classrooms (i.e., Zoom) or UICapture (Panopto), please contact Distance and Online Education Technical Support by selecting **Contact Technical Support** at the [Distance and Online Education Support Page](#) or by calling (319) 335-3925.

Need help with ICON or your HawkID? Please contact the ITS Helpdesk at [its-helpdesk@uiowa.edu](mailto:its-helpdesk@uiowa.edu) or (319) 384-HELP.

## Required Textbooks/Media

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The **required textbook** for this course is:

- Roger L. Cooke. *The History of Mathematics: A Brief Course*, Third Edition. Hoboken, NJ: John Wiley and Sons, 2013. ISBN: 978-1-118-21756-6. Hardbound or eBook.

**Note:** The book above may be ordered from the vendor of your choice (e.g. Amazon) or from a local bookstore. Listed below are bookstores in the Iowa City area; students may order books from these vendors **online** (visit vendor website), or by **phone**. **Walk-in orders** are also accepted. **Exact editions are required.**

- **Iowa Book** Web: <https://iowabook.bncollege.com/shop/iowa-book/home> Phone: 319.337.4188
- **Iowa Hawk Shop** Web: <https://www.bkstr.com/iowastore/home> Phone: 319.335.3179

Students will also read short articles, browse in websites, and view films. Access to all these additional materials will be provided on ICON.

## Grading Criteria:

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Your course grade will be based on points earned on the following items:

<b>Quizzes (10)</b>	100 points
<b>Problem Sets (8)</b>	200 points
<b>Response Papers (4)</b>	100 points
<b>Online Discussions (8)</b>	200 points
<b>Major Paper</b>	250 points
<b>Final Reflection</b>	150 points
<b>Total Possible:</b>	1000 points

Your final grade will be awarded on the basis of total points earned, according to the following scheme:

Any student earning at least...	will receive a final grade of at least...
900 total points	A-
800 total points	B-
700 total points	C-
600 total points	D-

## Course Structure

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This course is being offered over the World Wide Web as a Distance Education offering. Students will **login to the course site** on ICON to access the course materials (syllabus, assignments, schedules), and the discussions forum. For details of the course assignments and activities, see the **Course Work** section of this syllabus. Course content consists of the textbook, some additional articles and films, and several websites.

Students are expected to visit the course site regularly to:

- **Access assigned course materials (posted on the Modules page)** such as pre-recorded lectures and journal articles.
- **Review the course homepage regularly** for any updates on the **Announcements** and/or **Calendar** pages.
- **Submit** Assignments corresponding to each weekly Module.

## Course Work

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### Quizzes (10; 100 points total):

There will be ten online quizzes covering material from the lectures and reading assignments, during **Weeks 1, 2, 3, 5, 6, 7, 9, 10, 12, and (optionally) 15**. Each quiz is worth 10 points and consists of 3 true/false or multiple-choice questions. Students will have 3 minutes to complete each quiz. Due dates are listed in the **Course Calendar**, and quizzes are scored automatically upon submission.

### Problem Sets (8; 200 points total):

Each student will complete and submit eight Problem Sets, during **Weeks 1, 2, 3, 6, 7, 9, 10, and 15**. These are intended to provide insight into the mathematical problems and methods characteristic of various cultures and historical periods. Each Problem Set is worth 25 points and should be completed by hand, scanned into pdf format, and submitted online. Due dates are listed in the **Course Calendar**.

### Response Papers (4; 100 points total):

Each student will complete and submit four Response Papers, during **Weeks 4, 5, 9, and 10**. These are intended to allow for informal written reflection on historical and mathematical issues arising from the readings, lectures, and videos. Each assignment is worth 25 points and should be completed in Microsoft Word and submitted online. Due dates are listed in the **Course Calendar**.

### Online Discussions (9; 200 points total plus a 20-point extra credit opportunity):

During the first week of class, students will participate in the Introduce Yourself Discussion forum, worth 20 points extra credit, in which they'll get to know their instructor and fellow classmates. In addition, students will participate in eight (8) online Discussion forums—during **Weeks 1, 2, 5, 7, 11, 12, 13, and 15**—based on questions from the instructor relevant to the reading, lectures, and videos for that week. Students will answer instructor questions and then discuss the questions with classmates; participation in each online discussion is worth 25 points. See the **Course Calendar** for posting deadlines.

### Major Paper (1; 250 points total)

Students will write a Major Paper, 5–7 pages in length on a subject in the History of Mathematics. The paper will be worth 250 points and will be submitted in stages, with written feedback from me on each stage:

- A **Proposal**, worth 25 points, detailing the topic about which you wish to write (**Week 3**).
- An **Outline & Annotated Bibliography**, worth 25 points (**Week 6**).
- A **First Draft**, worth 50 points (**Week 8**).
- A **Final Draft**, worth 150 points (**Week 14**).

See the **Course Calendar** for specific deadlines.

### Final Reflection (1; 150 points total)

At the end of the course, each student will submit a final written reflection on what they've learned in the course about both mathematics and its history, with a particular focus on the ways in which their understanding of the history of mathematics has changed over the course of the semester. This Final Reflection is due during **Week 16**.

## Course, College, and University Policies:

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As a registered student in a Distance and Online Education course through The University of Iowa, you are responsible for the course and college/university policies posted below.

### Course Policies:

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Students taking Distance and Online Education courses at the University of Iowa are entitled and held to the same student rights and responsibilities as on campus students; see the Distance and Online Education Policies page, <https://distance.uiowa.edu/policies>, for more information. In addition, the following specific policies apply to students registered in this online course.

**Communications:** Students can expect to receive weekly communications from the instructor (via course “Announcements”) introducing assigned coursework. Students may wish to configure their ICON account so that announcements come directly to their University of Iowa (@uiowa) email. Communications between students and instructor will largely be carried out via University of Iowa (@uiowa) email, so students are responsible for checking that email on a regular, ongoing basis. You can expect your instructor to respond to your inquiries within 24–48 hours.

### Assignment Format:

- **Each Response Paper, each submission associated with the Major Paper, and the Final Reflection** should be submitted as a single Microsoft Word file, double-spaced, with one-inch margins, in a legible 12-point font (e.g., Times New Roman). Include your name, course number, and assignment title on the first page of each submission, and number each page clearly.
- Each **Problem Set** should be submitted as a single PDF file. I strongly prefer handwritten assignments, so long as your writing scans legibly and clearly. Please use the lowest scan resolution that produces a clear and legible PDF. Include your name, course number, and assignment title on the first page of each submission, and number each page clearly.
- Instructions for completing **Online Discussions** are provided in the corresponding Assignment.
- For your own protection, always **keep a copy of all work you submit for the course.**

**Exam Registration:** There are no examinations in this course.

**Due Dates and Missed Deadlines:** Due dates are stated in the Course Calendar. Many assignments have both a due date and a grace period, during which you may submit without penalty; the end date of the grace period will be considered the absolute deadline for the assignment. If for any reason you are unable to complete an assignment by the agreed-upon deadline, you should contact me via email as soon as possible, preferably in advance. As a general rule, I do not grant extensions on deadlines *except* in case of illness or injury, family emergency, required university activities, mandatory religious observances, and other unavoidable circumstances, in accordance with College of Liberal Arts and Sciences policy on absences.

**Netiquette:** The term *netiquette* refers to the practice of communicating effectively and respectfully online. In this online course, it’s especially important to communicate with your instructor and your classmates in ways that clearly communicate both content and respect. We’ll discuss this further as the course progresses.

**Sharing of Course Recordings:** Recorded lectures are the intellectual property of the faculty, and they may not be shared or reproduced without the explicit, written consent of the faculty member. Further, students may not share these sessions with those not in the class or upload them to any other online environment. Doing so constitutes a breach of the [Code of Student Life](#), and, in some cases, a violation of state and federal law, including the Federal Education Rights and Privacy Act (FERPA).

## College & University Policies (Spring 2024):

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**Administrative Home of the Course:** The administrative home of this course is the [UI College of Liberal Arts and Sciences](#), which governs academic matters relating to the course such as the add/drop deadlines, the second-grade-only option, issues concerning academic fraud or academic probation, and how credits are applied for various graduation requirements. Different colleges might have different policies. See the [CLAS Academic Policies Handbook](#) for details. Questions? Contact your academic advisor or the Office of Academic Programs and Student Development, 120 Schaeffer Hall, (319) 335-2633, [clasps@uiowa.edu](mailto:clasps@uiowa.edu).

**Absences & Attendance:** In an online course, “attendance” is defined in terms of academic activity (e.g., submitting an academic assignment, participating in online discussion, initiating contact with the instructor to ask a question about course content). In the event of illness, military service obligations, religious observance, participation in a University-sponsored activity, or unavoidable personal circumstances that may impact your ability to participate in academic activity in a timely fashion, students should communicate with the instructor as soon as possible. For further details see the [CLAS policy on Attendance and Absences](#) and [Chapter 8: Absences from Class](#) in the [University Operations Manual](#).

**Academic Honesty, Academic Misconduct, and Use of AI Tools:** All students are expected to abide by the [College of Liberal Arts & Sciences \(CLAS\) Code of Academic Honesty](#). As your instructor, I am expected to follow [CLAS procedures for reporting academic misconduct to the College](#).

Generative AI (such as ChatGPT) is an emerging technology that can be used to create new content, including written text. While there are a variety of settings in which this technology will likely become a go-to tool, our Math 4120 course is not one of them. In Math 4120 you will devote time and effort to developing the ability to express your own views, in your own words. With this in mind, I consider use of generative AI tools in this course to be a form of academic dishonesty.

**Accommodations for Students with Disabilities:** The University of Iowa is committed to providing an academic experience that is accessible to all students. A student may request academic accommodations for a disability (such as a mental health, attention, learning, vision, physical or health-related condition) through [the Student Disability Services \(SDS\)](#) office. The student is responsible for discussing specific accommodations with the instructor. Note that accommodations are not granted retroactively but from the time of the student’s request to the instructor onward; additionally, accommodations must be requested at least two weeks in advance of the related assignment or exam.

**Communication via UI Email:** Students are responsible for all official correspondence sent to their UI email address (@uiowa.edu) and must use this address for communication with instructors or staff in the UI community. Emails should be respectful and brief; more complex matters can be addressed during the instructor’s drop-in hours, for example. While they may choose to do so, faculty are not required to answer email after business hours or during the weekends.

**Complaint Procedures:** If at any time you have concerns about the class or your performance in it, please begin by contacting the instructor. If you do not feel that your concern has been resolved satisfactorily, you may contact the Department Chair (contact information provided at the top of page one of this syllabus). If not resolved, you may bring your concern to the CLAS Office of Academic Programs. See the [CLAS statement of Student Rights and Responsibilities](#) for further details.

**Drop Deadline for this Course:** You may drop an individual course before the add/drop date; if you drop after this date the grade of “W” will appear on your transcript. The mark of “W” is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the

[Registrar's website](#). Undergraduate students can find policies on dropping CLAS courses at the [CLAS Academic Policy website](#).

**Free Speech and Expression:** The University of Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We are committed to open inquiry, vigorous debate, and creative expression inside and outside the classroom. Visit [Free Speech at Iowa](#) for more information on the university's policy on free speech and academic freedom.

**Mental Health Resources and Student Support.** Students are encouraged to be mindful of their mental health seek help as a preventive measure, or when they feel stressed or overwhelmed. Students should talk to their instructors for guidance with specific class-related concerns and are encouraged to contact [University Counseling Service \(UCS\)](#) at 319-335-7294 during regular business hours to schedule an appointment. UCS offers individual, couples, and group counseling, and can also make referrals to other resources. [UI Student Health](#) also addresses related concerns. These visits are free to students. Find out more about university and community mental health resources at the [Mental Health at Iowa website](#).

[Student Care & Assistance](#) provides support to University of Iowa students experiencing a variety of crisis and emergency situations, including but not limited to medical issues, family emergencies, unexpected challenges, and sourcing basic needs such as food and shelter. More information on the resources related to basic needs can be found at the [Division of Student Life Basic Needs website](#). Students are encouraged to contact [Student Care & Assistance](#) in the Office of the Dean of Students (Room 135 IMU, [dos-assistance@uiowa.edu](mailto:dos-assistance@uiowa.edu), 319-335-1162) for assistance and further information.

**Sexual Harassment/Sexual Misconduct and Supportive Measures:** The University of Iowa prohibits all forms of sexual harassment, sexual misconduct, and related retaliation. The [Policy on Sexual Harassment and Sexual Misconduct](#) governs actions by students, faculty, staff and visitors. Incidents of sexual harassment or sexual misconduct can be reported to the [Title IX and Gender Equity Office](#) or to the [Department of Public Safety](#). Students impacted by sexual harassment or sexual misconduct may be eligible for academic supportive measures and can learn more by [contacting the Title IX and Gender Equity Office](#) or watching the Office of Student Life's [Confidential Resources video](#).

**Statement on Non-Discrimination and Inclusion:** The University of Iowa prohibits discrimination in employment, educational programs, and activities on the basis of race, creed, color, religion, national origin, age, sex, pregnancy, disability, genetic information, status as a U.S. veteran, service in the U.S. military, sexual orientation, gender identity, associational preferences, or any other classification that deprives the person of consideration as an individual. The university also affirms its commitment to providing equal opportunities and equal access to university facilities. For more information, contact the [UI Office of Institutional Equity](#).

In keeping with these policies, we aim to ensure this online classroom is a respectful and inclusive place for people of all identities and backgrounds. Toward this goal, students are invited share their pronouns and chosen/preferred names in [MyUI](#), which is accessible to instructors and advisors.

**Course Calendar** follows.

This online course is organized within a structure of scheduled course work as detailed in the weekly calendar below. Although we will not have synchronous meetings in a classroom or on Zoom, we will progress through the course materials as a class. For this reason, you must manage your time effectively in order to complete the assigned course work according to the due dates listed in the calendar.

### Week 1 | 16–21 January | Module 1: Mathematics and its Origins

#### Learning Objectives:

- To develop preliminary answers to the questions *What is mathematics about?* and *What motivates people to do mathematics?*
- To develop an understanding of the distinction between the *history* and *heritage* of mathematics.
- To gain familiarity and fluency with some of the basic techniques of early Mesopotamian mathematics.

#### Due Dates:

- Introduce Yourself Discussion Forum:** Brief video introduction due Thu 18 Jan, text replies due Sun 21 Jan. Worth 20 points extra credit!
- Week 1 Online Discussion:** Initial post due Thu 18 Jan; replies due Sun 21 Jan.
- Problem Set 1:** Due Sun 21 Jan.
- Quiz 1:** Due Sun 21 Jan.

#### This Week:

- **Review** the information posted under the **Getting Started** module.
- **Introduce** yourself to your professor and your peers. Post a brief video introduction in the **Introduce Yourself** discussion board. Completion of this introduction provides you with 20 points extra credit!
- **Watch** Lecture 1.
- **Read** Cooke, pp. 1–55 (Part I, Chapters 1 & 2; Part II, Chapters 3–5).
- **Participate** in the Week 1 Online Discussion.
- **Submit** Problem Set 1.
- **Take** Quiz 1.



**Week 2 | 22–28 January | Module 2: Ancient Egypt, Ancient Greece**

**Learning Objectives:**

- To gain familiarity with the history, methods, and purposes of ancient Egyptian mathematics.
- To develop a basic timeline for the development of ancient Greek mathematics.
- To describe the main concerns of early Greek geometry, astronomy, and number theory.

**Due Dates:**

- Week 2 Online Discussion:** Initial post due Thu 25 Jan; replies due Sun 28 Jan.
- Problem Set 2:** Due Sun 28 Jan.
- Quiz 2:** Due Sun 28 Jan.

**This Week:**

- **Watch** Lecture 2.
- **Read** Cooke, pp. 56–114 (Part II, Chapters 6 & 7; Part III, Chapters 8–10).
- **Participate** in the Week 2 Online Discussion.
- **Submit** Problem Set 2.
- **Take** Quiz 2.
- **Begin research** to select a topic for your Major Paper; the Paper Proposal is due next week!

**Week 3 | 29 January–4 February | Module 3: Greek Mathematics to Euclid and Archimedes**

**Learning Objectives:**

- To describe the major concerns of early Greek mathematics.
- To describe the specific contributions of Plato, Aristotle, Eudoxus, Euclid, and Archimedes.

**Due Dates:**

- Major Paper Proposal:** Due Thu 1 Feb.
- Problem Set 3:** Due Sun 4 Feb.
- Quiz 3:** Due by Sun 4 Feb.

**This Week:**

- **Watch** Lecture 3.
- **Read** Cooke, pp. 115–159 (Part III, Chapters 11–14).
- **Submit** Major Paper Proposal.
- **Submit** Problem Set 3.
- **Take** Quiz 3.

**Week 4 | 5–11 February | Module 4: Euclid's *Elements***

**Learning Objectives:**

- To describe the contents and purpose of Book I of Euclid's *Elements*.

**Due Dates:**

- Response Paper 1:** Due Sun 11 Feb.

**This Week:**

- **Watch** Lecture 4.
- **Read** David Joyce's commentary on Euclid's *Elements*, Book I (available online).
- **Submit** Response Paper 1.
- **Continue research** toward your Major Paper; the Outline & Annotated Bibliography are due in Week 6.

**Week 5 | 12–18 February | Module 5: Apollonius, Ptolemy, and Later Greek Mathematics**

**Learning Objectives:**

- Describe the relationship between Apollonius' work on conic sections and our modern understanding.
- Characterize and summarize the work of later Greek mathematicians (e.g., Diophantus, Pappus, Hypatia).

**Due Dates:**

- Week 5 Online Discussion:** Initial post due Thu 15 Feb; replies due Sun 18 Feb.
- Response Paper 2:** Due Sun 18 Feb.
- Quiz 4:** Due Sun 18 Feb.

**This Week:**

- **Watch** Lecture 5.
- **Read** Cooke, pp. 160–199 (Part III, Chapters 15–18).
- **Read** Michael A.B. Deakin, Hypatia and Her Mathematics, *American Mathematical Monthly* Vol. 101, No. 3 (1994), 234–243, available online via the UI Library.
- **Participate** in the Week 5 Online Discussion.
- **Submit** Response Paper 2.
- **Take** Quiz 4.
- **Continue research** toward your Major Paper; the Outline & Annotated Bibliography are due next week.

**Week 6 | 19–25 February | Module 6: India, China, and Japan**

**Learning Objectives:**

- To describe the early development of mathematics in India, China, and Japan and identify the major sources for those traditions.
- To understand the early development of the Hindu-Arabic numeral system.

**Due Dates:**

- Major Paper Outline & Annotated Bibliography:** due Thu 22 Feb.
- Problem Set 4:** Due Sun 25 Feb.
- Quiz 5:** Due Sun 25 Feb.

**This Week:**

- **Watch** Lecture 6.
- **Read** Cooke, pp. 201–280 (Part IV, Chapters 19–24).
- **Submit** Major Paper Outline & Annotated Bibliography.
- **Submit** Problem Set 4.
- **Take** Quiz 5.
- **Continue research** for the First Draft of the Major Paper, due in Week 8.

**Week 7 | 26 February–3 March | Module 7: Islam and Medieval Europe**

**Learning Objectives:**

- To outline the contributions of early Islam to the preservation, transmission, and further development of mathematics.
- To describe the reawakening of mathematical activity in medieval and Renaissance Europe.
- To outline the factors leading to the widespread adoption of the Hindu-Arabic numeral system.

**Due Dates:**

- Week 7 Online Discussion:** Initial post due Thu 29 Feb; replies due Sun 3 Mar.
- Problem Set 5:** Due Sun 3 Mar.
- Quiz 6:** Due Sun 3 Mar.

**This Week:**

- **Watch** Lecture 7.
- **Read** Cooke, pp. 281–337 (Part V, Chapters 25–27; Part VI, Chapters 28–29).
- **Participate** in the Week 7 Online Discussion.
- **Submit** Problem Set 5.
- **Take** Quiz 6.
- **Continue research** and writing for the First Draft of the Major Paper, due next week!

**Week 8 | 4–10 March | Major Paper, First Draft**

**Learning Objectives:**

- To produce a coherent draft of an essay dealing with a subject in the History of Mathematics that conveys its significance to you and its wider significance.

**Due Dates:**

- Major Paper, First Draft:** Due Sun 10 Mar.

**This Week:**

- **Submit** the Major Paper, First Draft.

<b>Spring Break</b>   11–17 March	
<b>Week 9</b>   20–26 March   Module 8: Algebra, Analytic Geometry, and Calculus	
<p><b>Learning Objectives:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> To identify key innovations in algebra, notation, and computation in 16<sup>th</sup> and early 17<sup>th</sup> century European mathematics.</li> <li><input type="checkbox"/> To trace the development of calculus from the 16<sup>th</sup> and 17<sup>th</sup> centuries to its refinement in the 18<sup>th</sup> and 19<sup>th</sup> centuries.</li> </ul> <p><b>Due Dates:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Response Paper 3:</b> Due Thu 21 Mar.</li> <li><input type="checkbox"/> <b>Problem Set 6:</b> Due Sun 24 Mar.</li> <li><input type="checkbox"/> <b>Quiz 7:</b> Due Sun 24 Mar.</li> </ul>	<p><b>This Week:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Watch</b> Lecture 8.</li> <li>▪ <b>Read</b> Cooke, pp. 338–347 and pp. 358–401 (Part VI, Chapter 30 and Chapters 32–34).</li> <li>▪ <b>Submit</b> Response Paper 3.</li> <li>▪ <b>Submit</b> Problem Set 6.</li> <li>▪ <b>Take</b> Quiz 7.</li> </ul>
<b>Week 10</b>   25–31 March   Module 9: Mathematics Becomes Modern	
<p><b>Learning Objectives:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> To describe key episodes in the development of the theory of probability.</li> <li><input type="checkbox"/> To discuss the development of algebra from the 17<sup>th</sup> to the 19<sup>th</sup> centuries.</li> <li><input type="checkbox"/> To discuss the early development of non-Euclidean geometry and complex analysis.</li> </ul> <p><b>Due Dates:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Response Paper 4:</b> Due Thu 28 Mar.</li> <li><input type="checkbox"/> <b>Problem Set 7:</b> Due Sun 31 Mar.</li> <li><input type="checkbox"/> <b>Quiz 8:</b> Due Sun 31 Mar.</li> </ul>	<p><b>This Week:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Watch</b> Lecture 9.</li> <li>▪ <b>Read</b> Cooke, pp. 403–404, 417–447, and 481–510 (Part VII, Introduction, Chapters 36–37 and Chapters 40–41).</li> <li>▪ <b>Submit</b> Response Paper 4.</li> <li>▪ <b>Submit</b> Problem Set 7.</li> <li>▪ <b>Take</b> Quiz 8.</li> </ul>

**Week 11** | 1–7 April | Module 10: Episodes in 20<sup>th</sup> Century Mathematics, I: Hardy & Ramanujan

**Learning Objectives:**

- Describe the mathematical collaboration of G.H. Hardy and Srinivasa Ramanujan and its ongoing significance.
- Discuss the depiction of mathematicians in *The Man Who Knew Infinity*.

**Due Dates:**

- Week 11 Online Discussion:** Initial post due Thu 4 Apr; replies due Sun 7 Apr.

**This Week:**

- **Watch** the film, *The Man Who Knew Infinity*, available online via ICON.
- **Read** G.H. Hardy, The Indian Mathematician Ramanujan, *American Mathematical Monthly*, Vol. 44, No. 3 (Mar 1937), pp. 137–155, available online via the UI Library.
- **Participate** in the Week 11 Online Discussion.

**Week 12** | 8–14 April | Module 11: Social Issues in Mathematics

**Learning Objectives:**

- To describe the achievements of women mathematicians and mathematicians of African ancestry.
- To understand the social conditions under which women and African-Americans have pursued careers in mathematics.

**Due Dates:**

- Week 12 Online Discussion:** Initial post due Thu 11 Apr; replies due Sun 14 Apr.
- Quiz 9:** Due Sun 14 Apr.

**This Week:**

- **Watch** Lecture 11.
- **Read/browse** the websites *Mathematicians of the African Diaspora* and *Biographies of Women Mathematicians at Agnes Scott College* available online.
- **Participate** in the Week 12 Online Discussion.
- **Take** Quiz 9.

**Week 13** | 15–21 April | Module 12: Episodes in 20<sup>th</sup> Century Mathematics, II: Julia Robinson & Hilbert’s 10<sup>th</sup> Problem

**Learning Objectives:**

- Describe the mathematical work of Julia Robinson and her work on Hilbert’s Tenth Problem.
- Describe your impressions of mathematical collaboration in the mid-20th century American mathematical community.

**Due Dates:**

- Week 13 Online Discussion:** Initial post due Thu 18 Apr; replies due Sun 21 Apr.

**This Week:**

- **Watch** the film, *Julia Robinson and Hilbert’s Tenth Problem*, available online via ICON.
- **Read** Reading TBD.
- **Participate** in the Week 13 Online Discussion.
- **Work on research and revisions** for the Final Draft of the Major Paper, due in Week 14.

**Week 14** | 22–28 April | Major Paper, Final Draft

**Learning Objectives:**

- To produce a complete, coherent, engaging essay on a topic in the history of mathematics.

**Due Dates:**

- Major Paper, Final Draft:** Due Sun 28 April.

**This Week:**

- **Submit** the Major Paper, Final Draft.

**Week 15** | 29 April–5 May | Module 13: Foundational Issues in Mathematics

**Learning Objectives:**

- To describe the history of attempts to precisely define the real numbers.
- To gain a sense of the role of set theory and logic in the history of mathematics.

**Due Dates:**

- Week 15 Online Discussion:** Initial post due Thu 2 May; replies due Sun 5 May.
- Problem Set 8:** Due Sun 5 May.
- Quiz 10 (optional):** Due Sun 5 May.

**This Week:**

- **Watch** Lecture 13.
- **Read** Cooke, pp. 521–557 (Part VII, Chapters 43–45).
- **Participate** in the Week 15 Online Discussion.
- **Submit** Problem Set 8.
- **Take** Quiz 10. **NOTE: This Quiz is optional: any student who does not take the Quiz will be awarded 10 points; any student who does take the Quiz will have 10 points added to their earned score (i.e., the earned score will count as extra credit).**

**Week 16** | 6–12 May | Final Examination Week

**Learning Objectives:**

- To reflect, in writing, on what you've learned in the course about both mathematics and its history, with a particular focus on the ways in which your understanding of the history of mathematics has changed over the course of the semester.

**Due Dates:**

- **Final Reflection:** Due Thu 9 May.

**This Week:**

- **Submit** your Final Reflection, a brief written account of what you've learned about mathematics and its history over the course of the semester.