

COR314: Mathematics and Human Nature

Spring 2022, 4 credits

MWF 11:45-12:45

Gables 102

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Office hours:

Monday, Wednesday, and Thursday afternoons 2-3:30. But I have a generous open-door policy and can usually be found in my office 8-4 when not in class. If you would like to schedule virtual office hours, please email.

Texts:

Students will be expected to purchase the texts *How to Bake Pi* and *The Unfinished Game* through the Perusall social annotation app we will be using. All other readings will be posted on Perusall. You may purchase text access codes for the books at the bookstore or pay directly through the Perusall site linked on Canvas.

Other requirements:

You must have a scientific calculator – **NOT A GRAPHING CALCULATOR** – for this course. A TI-30 is sufficient. For the first two weeks of the semester, you may use your cell phone as a calculator during class. After that, if you do not have a TI-30, you will need to use my extra-special estimation calculators (trust me, you don't want to have to take that option).

OBJECTIVES OF THE COURSE

This course explores major modern mathematical developments and helps students to understand and appreciate the unique approach to knowledge employed by mathematics.

The course is organized around the following central questions:

- What is mathematics?
- How is new mathematics developed?
- How are mathematical ways of knowing different from other disciplines?

Through successful completion of this course, students at the end of the semester should know about:

- The mathematical method as a way of knowing, utilizing axiomatization, abstraction, and generalization.
- The cumulative nature and historical context of mathematics as practiced by individuals/groups (including bias and stereotypes).
- Mathematical revolutions vs. “everyday” mathematics.

Through successful completion of this course, students at the end of the semester should be able to:

- Think critically about, and explicitly state, one's assumptions.
- Develop written and oral mathematical arguments, including proof(s) and counterexamples.
- Solve basic problems in the selected content area(s).
- Write clearly and succinctly about mathematical principles.

COURSE REQUIREMENTS

1. *Reading Responses on Perusall* – Each week I will post a number of readings on Perusall through Canvas. These readings may come directly from the two main texts of the course and from supplemental sources. I will leave prompts when appropriate to help guide your reading. “Readings” might also include web pages and videos. Perusall is a tool that allows you to comment on readings and respond to other students’ comments. Engagement is expected **throughout the week**, and you will not receive full credit if you wait until the last day to engage with the reading. Check out the *Introduction to Perusall* document on Canvas for more information. **Expect to spend 3-4 hours per week on the readings.**
2. *Class attendance and participation* – If you miss class, you will miss an important piece of information. Class time may include lectures, group work, problem solving practice, and discussion. You may have **6** meeting absences for any reason. **Starting with your 7th absence, your final grade will be lowered by ½ letter grade- that is, 5 percentage points.** For example, six periods missed will result in an 89% final grade (B+) becoming at 79% (C+). *Obviously, we live in unique times. In the event of a mandated quarantine or health concern that forces you to miss class I will give you the opportunity to meet with me via Zoom to review the class notes. If you attend these make-up sessions, you will not be considered absent.*
3. *Writing Assignments* – This course will require a number of writing assignments designed to prompt the student to both think and write about mathematics rather than just writing mathematics. This is not to say that problem solving and the methods associated with problem solving are not important, but rather to say that learning problem solving methods alone may not prompt an understanding of the mathematical principles of axiomatization, abstraction, and generalization. These assignments are intended to focus on these principles as a means of addressing the central question given in the goals and objectives.

Short writing assignments will be assigned most weeks and will be brief (one-to-two paragraph) responses to a prompt or some part of the reading. There will **10 short writing assignments** throughout the semester, all due on Wednesdays before class.

Long writing assignments may require multiple drafts and will be a more in-depth exploration of the ideas we are discussing in class and in the readings. There will be **4 long writing assignments** throughout the semester, all due on Fridays at 11:59PM.

Regardless of length, your grade on a writing assignment takes into account the standards of good writing (e.g., clear context and exposition, originality, spelling, punctuation, grammar, and proper citations as needed). All writing assignments will be graded based on the 12 point rubric available on Canvas.

4. *Problem Assignments* – There will be **six problem assignments** – each with 1-3 problems – assigned during the semester. This is not a class focused on getting the correct answer. I care very little whether or not you get the “correct” answer (and for some problems, there may not be a “correct” answer!) I am interested in how you **conceptualize** a problem, the ways in which you **employ logic and mathematical reasoning** to guide your work, and how you **communicate** your thought process. A grading rubric will be available on Canvas. Student can resubmit solutions for a revised grade, but only if (1) the original problem was submitted on time and (2) the student has visited the office for individual consultation. Late work can’t be revised, but it can be turned in for a 2 point deduction per 24 hours that the assignment is late.

5. *In-class Exams* – There will be two in-class exams during the semester. These will be a collection of problems and short-answer essays.
6. *Final Exam* – The final exam will be an essay exam with three prompts. You will have access to the exam on Canvas for 48 hours once you open it. The exam will be open-note and open text; you should expect to draw from these references in your responses. The exam must be completed by the end of the exam period (5/17/22).

COURSE POLICIES

Technology in the classroom: Cellphones can be kept on the desk in silent mode. Students observed texting or using their phones for non-course related purposes will be asked to stow their phone for the remainder of the class. Laptops and tablets should not be used in class except when I have specified that we will need them for an activity, or if you have asked for permission to take electronic notes. If you are observed to be using your laptop or tablet for non-course related purposes, you will be asked to stow the device. If you have a documented reason for using technology in the classroom, please inform me. If you are reprimanded twice in one class period for improper use of technology, you will be marked absent for that class.

Assignment due dates: All assignments are due on the date specified on Canvas. Late writing assignments will not be accepted unless the extended due date is discussed and agreed upon **24 hours before the original due date**. Late problem assignments will be accepted with a penalty (see above).

Dropping the Course: The course may be dropped with a grade of W through Monday, April 4th (provided that the student's work to that point has been of passing quality). After this date the grade of W will be assigned only in the case of withdrawal from the University or prolonged illness.

EXPECTATIONS FOR YOU

Commitment to Learning - Students should be prepared to question, learn and complete assignments in a timely and professional manner. For a four-credit hour course such as this, you should expect to spend at least **8-12 hours per week** on the coursework, including attending class, completing the readings, completing all nature of science assignments, and working on long-term deliverables like papers and presentations.

Community Mindfulness – In this course we form a learning community. Use this as an opportunity to become civically engaged on a small, but meaningful scale. We encourage you to be open to working with different classmates throughout the semester—it's okay to step out of your comfort zone. I invite and support expression of diverse thoughts, perspectives, and identities throughout the semester and will reject any form of intimidation, discrimination, and violence of any kind. Students are expected to be courteous and respectful to the instructor and fellow students in all written or verbal communications.

Academic Honesty - There is a zero-tolerance policy for any form of academic dishonesty in this course. Disciplinary action will be taken against any student found guilty of academic dishonesty such as cheating or plagiarism. **If your words match those of others, I will assume you copied rather than composing the answers yourself.** The penalty for being dishonest in this way is far greater than simply getting a wrong answer. Those committing academic dishonesty will be subject to disciplinary action up to and including failing the assignment, failing the course, and/or expulsion from the course or college.

From the Bulletin:

Persons who come to Oglethorpe University for work and study join a community that is committed to high standards of academic honesty. The honor code contains the responsibilities we accept by becoming members of the community and the procedures we will

follow should our commitment to honesty be questioned.

The students, faculty and staff of Oglethorpe University expect each other to act with integrity in the academic endeavor they share. Members of the faculty expect that students complete work honestly and act toward them in ways consistent with that expectation. Students are expected to behave honorably in their academic work and are expected to insist on honest behavior from their peers.

Oglethorpe welcomes all who accept our principles of honest behavior. We believe that this code will enrich our years at the University and allow us to practice living in earnest the honorable, self-governed lives required of society's respected leaders.

Our honor code is an academic one. The code proscribes cheating in general terms and also in any of its several specialized sub-forms (including but not limited to plagiarism, lying, stealing and interacting fraudulently or disingenuously with the honor council). The Code defines cheating as "the umbrella under which all academic malfeasance falls. Cheating is any willful activity involving the use of deceit or fraud in order to attempt to secure an unfair academic advantage for oneself or others or to attempt to cause an unfair academic disadvantage to others. Cheating deprives persons of the opportunity for a fair and reasonable assessment of their own work and/or a fair comparative assessment between and among the work produced by members of a group. More broadly, cheating undermines our community's confidence in the honorable state to which we aspire."

The honor code applies to all behavior related to the academic enterprise. Thus, it extends beyond the boundaries of particular courses and classrooms *per se*, and yet it does not extend out of the academic realm into the purely social one.

Examples of cheating include but are not limited to:

- 1.1 The unauthorized possession or use of notes, texts, electronic devices (including, for example, tablets, computers and smartphones), online materials or other such unauthorized materials/devices in fulfillment of course requirements.
- 1.2 Copying another person's work or participation in such an effort.
- 1.3 An attempt or participation in an attempt to fulfill the requirements of a course with work other than one's original work for that course.
- 1.4 Forging or deliberately misrepresenting data or results. Submitting results of an experiment, at which one was not present or present for less than the full time, as one's own.
- 1.5 Obtaining or offering either for profit or free of charge materials one might submit (or has submitted) for academic credit. This includes uploading course materials to online sites devoted, in whole or in part, to aiding and abetting cheating under the guise of providing "study aids." There is no prohibition concerning uploading exemplars of one's work to one's personal website or to departmental, divisional, University or professional society websites for purposes of publicity, praise, examination or review by potential employers, graduate school admissions committees, etc.
- 1.6 Violating the specific directions concerning the operation of the honor code in relation to a particular assignment.
- 1.7 Making unauthorized copies of graded work for future distribution.
- 1.8 Claiming credit for a group project to which one did not contribute.
- 1.9 Plagiarism, which includes representing someone else's words, ideas, data or original research as one's own and in general failing to footnote or otherwise acknowledge the source of such work. One has the responsibility of avoiding plagiarism by taking adequate notes on reference materials (including material taken off the internet or other electronic sources) used in the preparation of reports, papers and other coursework.
- 1.10 Submitting one's own work for a course that was previously submitted for the same course, or another course, without proper citation.
- 1.11 Lying, such as: Lying about the reason for an absence to avoid a punitive attendance penalty or to receive an extension on an exam or on a paper's due date; fraudulently obtaining Petrel Points by leaving an event soon after registering one's attendance and without offering to surrender the associated Petrel Point, or by claiming fictitious attendance for oneself or another; forging or willfully being untruthful on documents related to the academic enterprise, such as on an application for an independent study or on a registration form.
- 1.12 Stealing, such as: Stealing another's work so that he/she may not submit it or so that work can be illicitly shared; stealing reserve or other materials from the library; stealing devices and materials (such as computers, calculators, textbooks, notebooks and software) used in whole or in part to support the academic enterprise.
- 1.13 Fraudulent interaction on the part of students with the honor council, such as: Willfully refusing to testify after having been duly summoned; failing to appear to testify (barring a *bona fide* last-minute emergency) after having been duly summoned; testifying untruthfully.

Students pledge that they have completed assignments honestly by attaching the following statement to each piece of work submitted in partial fulfillment of the requirements for a course taken for academic credit:

"I pledge that I have acted honorably." (Followed by the student's signature)

The honor code is in force for every student who is enrolled (either full- or part-time) in any of the academic programs of Oglethorpe University at any given time. All cases of suspected academic dishonesty will be handled in accordance with the provisions established in this code. The honor council has sole jurisdiction in matters of suspected academic dishonesty. Alternative ways of dealing with cases of suspected academic fraud are prohibited. In cases of alleged academic dishonesty on the part of students, the honor council is the final arbiter. Reference the current Oglethorpe University Bulletin for information concerning all aspects of the honor code.

EXPECTATIONS FOR ME

Availability – I will be available during the regular office hours unless otherwise noted. I am also readily available by email and can often arrange times outside of my scheduled office hours to meet. I will respond to all emails within 24 hours, and often times much sooner. If at any time you feel that you are falling behind the material, please email me. There are many ways we can work to help better understand the concepts and ideas. It is my goal to make the material as accessible as possible.

Responsiveness – It is my goal to have all course materials assessed and returned with one week of when they are due. I believe that feedback on your work throughout the semester is critical to improve performance and maintain engagement. This will also inform decisions I make about the direction of the course. In addition, I am very open to feedback about the course, and will solicit feedback early in the semester so that I can adjust our plans if needed. Genuinely, my primary goal in teaching this course is to produce students who have a respect and understanding of the nature of science. If the course is not accomplishing that, we will discuss as a community how to make it happen.

Respect for Diversity: It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you. If you would feel more comfortable discussing your concerns about this course with an outside person, Dr. Stephen Herschler Mattern is the co-director of the Core program (smattern@oglethorpe.edu).

ADDITIONAL RESOURCES

Accessibility Services - If you are a student with a disability or disability related issue and feel that you may need a reasonable accommodation to fulfill the essential functions of the course that are listed in this syllabus, you are encouraged to contact Accessibility Services in the Academic Success Center at 404.364.8869 or <http://success.oglethorpe.edu/accessibility-services/>. In addition, Affordable Colleges Online lists detailed resources for students with disabilities here: <https://www.affordablecollegesonline.org/college-resource-center/resources-for-students-with-disabilities/>

Student Complaint Process - Oglethorpe University has established a formal mechanism to report incidents so that we can follow-up, investigate, and address any concern brought forward. Please use the following website to report a complaint: <https://oglethorpe.edu/student-complaint-process/> Complaints may be academic or non-academic in nature and examples include but are not limited to: ADA discrimination or appeal, discrimination complaint, harassment complaint, retaliation complaint, FERPA-related complaint and general complaints or appeals. Form entries will be sent to the Director of Compliance in the Office of the University Counsel.

Counseling Center - All students currently enrolled at Oglethorpe University may use Counseling Center services at no cost. From the Counseling Center website <https://counseling.oglethorpe.edu/>: Counseling is a collaborative process that involves the development of a unique, confidential helping relationship. In these relationships, counselors are facilitators who help their students understand themselves and their environments more accurately. Students are encouraged to understand their feelings and behaviors, relationships with others and life circumstances. Discussion of issues enables growth in making healthier choices and taking responsible action with themselves, relationships, family and academics. Psychotherapy can feel difficult because you are coming to discuss unpleasant aspects of your life. You may feel exhausted, sad, angry and frustrated. You can be confident that all of these feelings will dissipate as you work through your issues.

Library - Philip Weltner Library is your resource for research, writing, and citing. In addition to the main library website (<https://library.oglethorpe.edu/>), answers to common questions can be found on the “As A Librarian” website (<https://library.oglethorpe.edu/help/ask-a-librarian/>), where you can request a research consultation with the reference librarian.

Technical Support - For computer hardware, software, internet, etc. issues the helpdesk is available online at <http://itservices.oglethorpe.edu/contact/>, in OASIS under “Technology Issues Helpdesk Ticket,” via email at HelpDesk@oglethorpe.edu and via phone 404-364-8880.

GRADING POLICY

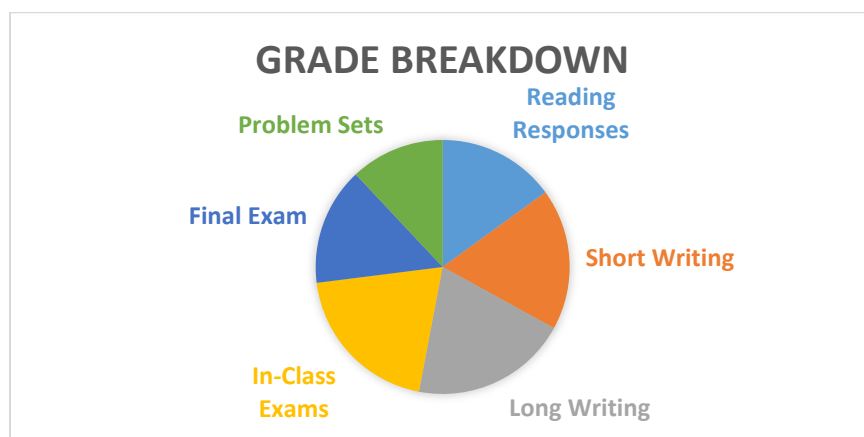
Grading scale:

A.....90-100	(A-....90-92)
B.....80-90	(B-....80-82,B+....87-90)
C.....70-80	(C-....70-72,C+....77-80)
D.....60-70	(D+....67-70)
F.....0-60	

Note that Incomplete (I) is given only under the rarest of circumstances. Refer to section 6.20.2 of the 2020-2021 [Bulletin](#) for a summary of requirements.

Your grade will be computed as follows:

Reading Responses	15%
Short Writing Assignments (10 assignments)	18%
Long Writing Assignments (4 assignments)	20%
Problem Sets (6 assignments)	12%
In-Class Exams	20%
Final Exam	15%



Course Schedule COR314 (These dates are tentative and subject to change)

Mondays		Wednesdays		Fridays	
		2/2	Reading: Course Syllabus	2/4	Reading: HTBP Prologue, Ch 1
2/7	Reading: Tao and Stewart	2/9	Reading: HTBP Ch 2 & 3 Due: Short Writing 1	2/11	Due: Long Writing 1
2/14	Reading: Lockhart	2/16	Reading: HTBP Ch 4 Due: Short Writing 2	2/18	Due: Problem Assignment 1
2/21	Reading: Baker	2/23	Reading: HTBP Ch 5 & 6 Due: Short Writing 3	2/25	Due: Long Writing 2
2/28	Reading: Abbott	3/2	Reading: HTBP Ch 7 Due: Short Writing 4	3/4	Due: Problem Assignment 2
3/7	Reading: Strogatz	3/9	Reading: HTBP Ch 8 Due: Short Writing 5	3/11	
3/14		3/16	Exam Review Due: Problem Assignment 3	3/18	Exam 1
3/21	SPRING BREAK	3/23	SPRING BREAK	3/25	SPRING BREAK
3/28	Reading: Goins	3/30	Reading: TUG Ch 1 & 2 Due: Short Writing 6	4/1	
4/4	Reading: Gutierrez	4/6	Reading: TUG Ch 3, 4 & 5 Due: Short Writing 7	4/8	No Class Due: Problem Assignment 4
4/11	Reading: Fischbein	4/13	Reading: TUG Ch 6 & 7 Due: Short Writing 8	4/15	Due: Long Writing 3
4/18	Reading: Crockett	4/20	Reading: TUG Ch 8 & 9 Due: Short Writing 9	4/22	Due: Problem Assignment 5
4/25	Due: LW 4 Proposal	4/27	No Class - LASS	4/29	Due: Problem Assignment 6
5/2	Reading: Bergstrom	5/4	Reading: TUG Ch 10 Due: Short Writing 10	5/6	Exam Review Due: Long Writing 4
5/9	Exam 2	5/11		5/13	

Important Dates

February 2 - First day of classes

March 21-25 – Spring Break

April 27 – No class, LASS

May 5 – Last day to withdraw

May 10 – Last day of classes

May 17 – Final Exam due