



FLORIDA ATLANTIC UNIVERSITY

MHF 6410-001 14846

Calculus-Historical Perspectiv

3 Credit(s)

Fall 2024 - 1 Full Term

Instructor Information

Zvi Rosen

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Office: SE 224, or **Zoom Office:** [https://fau-edu.zoom.us/my/rosenz?](https://fau-edu.zoom.us/my/rosenz?pwd=eStHmVg2d0RHbmpuZGx5cUpaU2FwZz09)

[pwd=eStHmVg2d0RHbmpuZGx5cUpaU2FwZz09](https://fau-edu.zoom.us/my/rosenz?pwd=eStHmVg2d0RHbmpuZGx5cUpaU2FwZz09)

Office Hours: Thursday 1 pm - 2 pm or by appointment: <https://rosenz.youcanbook.me/>

Email: rosenz@fau.edu or preferably Canvas Inbox.

Course Description

Calculus from a Historical Perspective

Selected topics in calculus, from the historical point of view including Archimedes' quadrature of the parabola, the calculation of Pi, the Bernoulli numbers and sums of powers of integers.

Calculus is one of the most powerful inventions in human history. The modern calculus curriculum tends to follow an ordering based on logic, beginning with limits and providing formal definitions for things like derivatives, integrals, and series convergence. However, that's not how the calculus developed in human society: it started with hints in the ancient world, followed by a flash of romantic creativity in the 17th century, which was only later followed by rigor. In this course, we will follow the historical procession of calculus, and see what new insights that can bring.

MAC 2311: Calculus with Analytic Geometry 1

MAC 2312: Calculus with Analytic Geometry 2

Mathematical and educational maturity for a course intended for students in the MST program.

Instructional Method

Fully Online Class

100% of the course is delivered online.

Required Texts/Materials

Calculus Gallery

ISBN: 9780691182858

Publisher: Princeton Univ Press c/o Perseus

The Calculus Gallery

ISBN: 9780691184548

Publisher: Princeton Univ Press c/o Perseus

Course Objectives/Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Analyze famous calculus problems and their solutions. (CO: 1)
2. Utilize basic techniques in calculus and related areas. (CO: 2)
3. Identify examples that illustrate important definitions in the calculus. (CO: 3)
4. Describe historical trends in the development of the calculus. (CO: 4)
5. Use appropriate mathematical software to support learning and understanding. (CO: 5)
6. Communicate mathematics effectively. (CO: 6)

Faculty Rights and Responsibilities

Florida Atlantic University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. To ensure these rights, faculty members have the prerogative to:

- Establish and implement academic standards.
- Establish and enforce reasonable behavior standards in each class.
- Recommend disciplinary action for students whose behavior may be judged as disruptive under the Student Code of Conduct [University Regulation 4.007](#).

Disability Policy

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

Course Evaluation Method

The instructor will calculate your grade based on the following weighted distribution:

Assessment	Weight (%)
Discussion Boards	15%
GeoGebra Journal	50%
Group Presentation	20%
Group Write-up	15%
TOTAL	100%

Discussion Boards (20%)

As part of the course modules, you will be assigned readings (from *The Calculus Gallery* and other sources) and video lectures. There will be a discussion board in which you will post an original comment related to those readings and lectures. **Take care that your post relates to the prompt, and represents a thoughtful effort.**

You will then reply to at least one other student's post with a substantive response. A substantive response adds value to the discussion by bringing new ideas, research, evidence, etc. to the

conversation. "I agree," "Ditto" and the like are not acceptable replies. The rules of Netiquette must be followed. Full sentences, proper spelling, source citations, etc., are expected. A first post should be made by **TUESDAY** prior to the deadline. Your second post, replying to your peers, can be made until Friday 11:59 pm.

GeoGebra Journal (50%)

In this course, you will create your own GeoGebra book and submit a link to the professor. For each module, you will add a lesson plan and complete some exercises related to the readings and video lecture in the module. Be sure to add a separate page for each new topic within a module. The professor will check your GeoGebra book to provide feedback on grades for each module.

Group Presentation (20%)

You will collaborate in a group of 2-3 students to create a video / live presentation incorporating slides and GeoGebra. You will select a topic, develop a lesson plan, create a draft of your presentation, then present to the class, either as a live Zoom talk or as a video posted to YouTube.

Group Write-up (15%)

Accompanying your group presentation, there will be a write-up of the research topic you studied. This should include (1) a discussion of history, (2) an in-depth exposition of the mathematics, and (3) an exploration of pedagogical strategies for communicating the topic.

Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).

Attendance Policy Statement

Students are expected to attend all their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal

obligations, or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances, and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

This is an asynchronous class, so attendance is not required at a specific time, but you should be checking Canvas for announcements and assignments at least once every 2 days. Attendance at office hours is also encouraged.

Religious Accommodation Policy Statement

In accordance with the rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs regarding admissions, registration, class attendance, and the scheduling of examinations and work assignments. University Regulation 2.007, Religious Observances, sets forth this policy for FAU and may be accessed on the FAU website at www.fau.edu/regulations.

Any student who feels aggrieved regarding religious accommodations may present a grievance to the executive director of The Office of Civil Rights and Title IX. Any such grievances will follow Florida Atlantic University's established grievance procedure regarding alleged discrimination.

Time Commitment Per Credit Hour

For traditionally delivered courses, not less than one (1) hour of classroom or direct faculty instruction each week for fifteen (15) weeks per Fall or Spring semester, and a minimum of two (2) hours of out-of-class student work for each credit hour. Equivalent time and effort are required for Summer Semesters, which usually have a shortened timeframe. Fully Online courses, hybrid, shortened, intensive format courses, and other non-traditional modes of delivery will demonstrate equivalent time and effort.

Course Grading Scale

Letter Grade	Letter Grade
A	94 - 100%
A-	90 - 93%
B+	87 - 89%

Letter Grade	Letter Grade
B	83 - 86%
B-	80 - 82%
C+	77 - 79%
C	73 - 76%
C-	70 - 72%
D+	67 - 69%
D	63 - 66%
D-	60 - 62%
F	Below 60

Grade Appeal Process

You may request a review of the final course grade when you believe that one of the following conditions apply:

- There was a computational or recording error in the grading.
- The grading process used non-academic criteria.
- There was a gross violation of the instructor's own grading system.

[University Regulation 4.002](#) of the University Regulations contains information on the grade appeals process

Policy on Make-up Tests, Late work, and Incompletes

Late homeworks will not be accepted without a documented acceptable excuse. You are encouraged to complete your homework well in advance to avoid any issues.

Incompletes will not be given unless a persuasive reason is provided by the student, e.g. a documented car crash put the student in the hospital for a number of weeks at the end of the semester.

Policy on the Recording of Lectures

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

This policy is not relevant to our course, as all lectures will be publicly available on YouTube.

Artificial Intelligence Preamble

FAU recognizes the value of generative AI in facilitating learning. However, output generated by artificial intelligence (AI), such as written words, computations, code, artwork, images, music, etc., for example, is drawn from previously published materials and is not your own original work.

FAU students are not permitted to use AI for any course work unless explicitly allowed to do so by the instructor of the class for a specific assignment. [\[Policy 12.16 Artificial Intelligence\]](#)

Class policies related to AI use are decided by the individual faculty. Some faculty may permit the use of AI in some assignments but not others, and some faculty may prohibit the use of AI in their course entirely. In the case that an instructor permits the use of AI for some assignments, the assignment instructions will indicate when and how the use of AI is permitted in that specific assignment. It is the student's responsibility to comply with the instructor's expectations for each assignment in each course. When AI is authorized, the student is also responsible and accountable for the content of the work. AI may generate inaccurate, false, or exaggerated information. Users should approach any generated content with skepticism and review any information generated by AI before using generated content as-is.

If you are unclear about whether or not the use of AI is permitted, ask your instructor before starting the assignment.

Failure to comply with the requirements related to the use of AI may constitute a violation of the [Florida Atlantic Code of Academic Integrity, Regulation 4.001.](#)

Proper Citation: If the use of AI is permitted for a specific assignment, then use of the AI tool must be properly documented and cited. For more information on how to properly cite the use of AI tools, visit

<https://fau.edu/ai/citation>

AI Language Specific To This Course

AI may be used in this course under certain conditions:

1. On the group assignment, you will include a short paragraph describing how you used AI services like ChatGPT. Examples of prompts and how you incorporated the output should be included in this paragraph.
2. For ANY course assignment (discussion board or GeoGebra), if it is clear to the instructor that you have not edited or processed the AI output, your assignment will immediately receive a ZERO with **no** opportunity for makeup. BE SURE TO CAREFULLY REVIEW AI PRODUCTS!

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual therapy, group therapy, and crisis services, to name a few - offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

Student Support Services and Online Resources

- [Center for Learning and Student Success \(CLASS\)](#)
- [Counseling and Psychological Services \(CAPS\)](#)
- [FAU Libraries](#)
- [Math Learning Center](#)
- [Office of Information Technology Helpdesk](#)
- [Center for Global Engagement](#)
- [Office of Undergraduate Research and Inquiry \(OURI\)](#)
- [Science Learning Center](#)
- [Speaking Center](#)
- [Student Accessibility Services](#)
- [Student Athlete Success Center \(SASC\)](#)
- [Testing and Certification](#)

- [Test Preparation](#)
- [University Academic Advising Services](#)
- [University Center for Excellence in Writing \(UCEW\)](#)
- [Writing Across the Curriculum \(WAC\)](#)

Course Topical Outline

	Dates	Topic
Module 1	08/17 - 08/30	Ancient Glimpses Greece
Module 2	08/31 - 09/13	Ancient Glimpses The Rest of the Ancient World
Module 3	09/14 - 09/27	Age of Discovery Newton & Leibniz
Module 4	09/28 - 10/11	Age of Discovery The Bernoullis and Euler
Module 5	10/12 - 10/18	Rise of Rigor Berkley's Critique
Module 6	10/19 - 11/01	Rise of Rigor Cauchy & Riemann
Module 7	11/02 - 11/15	Reimagining Cantor & Set Theory
Module 8	11/16 - 11/25	Reimagining Baire & Lebesgue
Module 9	12/02 - 12/06	Final Projects & Presentations