**SYLLABUS Spring 2023**
**MATH 1850:0431**
**The University of Iowa**
**The College of Liberal Arts and Sciences**
**Department of Mathematics**
**Calculus I (MATH:1850:0431)**
**Time and location: 3:30pm-4:20pm MTWF, 61 SH**

Some of the policies relating to this course (such as the drop deadline) are governed by its administrative home, the College of Liberal Arts and Sciences, 120 Schaeffer Hall.

**Prerequisites:** (MATH:1010 with a minimum grade of C- and MATH:1380 with a minimum grade of C-) or MATH:1460 with a minimum grade of C- or ALEKS score of 75 or higher or MPT Level 3 score of 9 or higher or (ALEKS score of 55 or higher and MATH:1010 with a minimum grade of C-) or MATH:1020 with a minimum grade of C- or (MATH:1340 with a minimum grade of C- and MATH:1010 with a minimum grade of C-) or (MATH:1005 with a minimum grade of C- and MATH:1010 with a minimum grade of C-)

**Approved GE:** Quantitative or Formal Reasoning.

**Instructor:** Enrique "Miguel" Barquinero
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E-mail: enrique-barquinero@uiowa.edu
Personal Website address: https://miguel-barquinero.com
Course Website: https://uiowa.instructure.com/courses/200756

**Supervisor**: Xiaoyi Zhang, 25E MLH, xiaoyi-zhang@uiowa.edu
**DEO**: Ryan Kinser, 14A MLH, ryan-kinser@uiowa.edu

**Description of Course:** This is a standard first semester course in Calculus. The sequence MATH:1850 - MATH:1860 (Calculus II) is one of the basic entry-level mathematics courses for students in the mathematical and physical sciences. Topics include fundamental concepts, limits, methods and techniques of differential calculus of a single variable (including power, product, quotient and chain rules; extreme values, graphing, optimization, implicit differentiation, related rates); definite and indefinite integrals, substitution rule, Fundamental Theorem of Calculus; applications including areas, and volumes. The students should expect the material to be covered at two to three times the pace in high schools. Students are expected to attend class and read the textbook for comprehension. Usually, for every hour of lecture and discussion time, the students are expected to spend three hours studying outside the class. The Examinations will cover the material discussed in class as well as assigned material from the text that is not discussed in class, if pertinent.

**Objectives and Goals of the Course**: The main goal of this class is to provide the mathematical background needed to familiarize students with several fundamental concepts in calculus such as limits, derivatives and integrals. The course emphasizes both the theoretical aspects of these notions as well as a wide range of applications to other sciences including engineering and economics. The students completing this course will be able to apply these concepts to real life problems that often arise in the natural sciences (e.g. optimization problems, modeling of various phenomena in physics, biology, astronomy etc). The students will be prepared for the second semester of calculus. The course is designed to be a half-year course; it is not, in general, recommended that student plan to take MATH:1850 and not MATH:1860. This course is also the building block for several subsequent classes.

**Required text**:

https://math.uiowa.edu/undergraduate-program/course-information/book-list

*The ICON Direct program will be used to provide required course materials via your ICON course site. Your U-Bill will be charged automatically after your course has started unless you opt out prior to the last day for tuition and fee reduction course deadline . Specific opt out information will be provided in the course syllabus and in the opt out tool . You are then responsible for obtaining an alternative copy of the text.*

- **Single Variable Calculus: Early Transcendentals** Required
  ISBN: 9780357022269
  Author: Stewart James; Clegg Daniel K.; Watson Saleem
  Publisher: Cengage ©2020
  Approximately $35.43 will be billed to your U-Bill

**The ICON Direct textbook is available through the Unizin Engage link on the ICON page.**

**Material to be covered:**

We will cover Chapters 1-6 of the textbook. Some sections will be omitted. The following list gives a breakdown of the content covered and the *expected* time spent on each topic.

- **Chapter 1**. (1- 5) Basic properties of a list of functions studied in the course including exponential, logarithmic and inverse functions. *(3 class periods)*
- **Chapter 2**. (1-8) Limits, one-side limits, infinite limits and limits to infinity. Vertical and horizontal asymptotes. Precise definition of limits and continuous functions. Using Intermediated Value Theorem to approximate roots. Tangent lines and derivatives. *(8 class periods)*
- **Chapter 3**. (1-11) Differentiation. Product, quotient and chain rules. Implicit differentiation. Linear approximation. Related rates and exponential growth. Hyperbolic functions. *(12 class periods)*
- **Chapter 4**. (1-5, 7-9) Extreme values. Monotonicity, concavity and graphing of functions. Mean Value Theorem and L'Hospital's Rule. Optimization and Newton's method. Antiderivatives *(8 class periods)*

- **Chapter 5**. (1-5) Riemann integrals and approximations of integrals by midpoint rule etc. Fundamental Theorem of Calculus and substitution rule. Indefinite integrals. *(5 class periods)*
- **Chapter 6**. (1-5) Areas and volumes of revolution. Work and average value of function if time allows. *(3-5 class periods)*

**Grading:**

**Grading System: Plus/minus** grading will be used.

35% 2 midterms, (in class on **TBD** and **TBD**)
20% Final exam (date, time, and place to be announced)
10% Quizzes, weekly on Fridays in class
25% Homework, assigned weekly on Monday, due the following Monday on ICON
10% Participation

**Final exam is comprehensive**. Midterms and quizzes are **not**, but often will rely on understanding of material from previous sections.

**A word about the grading philosophy**: The exams are worth relatively little in this section relative to other math courses, including for this same course. Furthermore, the test/quizzes will test fundamental understanding of the topics covered: they are not intended to be difficult. As a result, more weight is given to homework and participation.

**A Word about the Date and Time of the Final Exam:** The date and time of every final examination is announced by the Registrar generally by the fifth week of the classes. **No exams of any kind are allowed during the last week of classes.** All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of the final exam.

**Make-up policy:** As stated in CLAS webpage: https://clas.uiowa.edu/faculty/student-attendance-and-absences: "University policy requires that students be permitted to make up examinations missed because of illness, mandatory religious obligations, authorized UI activities, or unavoidable circumstances. An unavoidable circumstance is defined as an event beyond the student's control and often involves a serious and unexpected hospitalization, a family tragedy, or a related incident. Such circumstances **do not include** attendance at a wedding, a family vacation, obligations related to work or other such matters. The instructor of a student participating in an authorized UI activity is sent a statement generally by email from the UI official in charge of the event before the absence occurs; this statement will include the specific date and time that the student will miss class. Activities related to employment, fraternities or sororities, or volunteer activities are not UI authorized activities."

**Student Collaboration:** Student collaboration is NOT permitted on exams. Any attempt to collaborate during exams will result in a 0 score on that test.

The homework for this course is designed to help you master your knowledge related to the topics covered during lecture. As such, you may work on the homework problems with others or use online resources. However, please be aware that to master the skills needed for this class, practice is required and that to do well on the final exam you will need to work many of these problems multiple times without help. Be sure to test your knowledge by doing much of the homework on your own. In particular, for non-textbook sourced assignments, students should think critically about the problem on their own before seeking external aid. All other graded work for this class (quizzes and tests) must be completed individually and any form of cheating will be reported.

**Other Course Policies:**

*Homework***:** For almost all students, doing problems is the best way to learn the material. **Homework will be assigned every week on Mondays and should be turned in *as a single PDF* in the correct assignment on ICON**. No late homework is accepted without a university approved, documented reason. **Your lowest homework score will be dropped**. Your homework must be legible and answers should be clearly marked. Homework will be graded for accuracy and completion. The homework will be sourced from the textbook as well as assignments created for this course. Textbook questions will test ability to apply theorems to solve problems whereas the created assignments will challenge understanding of the theory.

*Exams:* There will be two midterm exams and a final exam. Books, notes and calculators are not allowed during exams. Tentative dates for the exams can be found in the schedule. See above for the Make-up Policy. The exams are worth relatively little in this section relative to other math courses, including for this same course. Furthermore, the exams will test basic understanding of the topics covered: they are not intended to be difficult.

*Quizzes:* The main purpose of quizzes is to help you evaluate your knowledge on a regular basis – identifying problem areas before the exams will allow you to get help before your grade suffers. **Quizzes are given in class on Fridays. About 10 minutes will be allotted during class for each quiz.** Quiz make-ups are only allowed with a university approved, documented reason. **Your lowest quiz score will be dropped**.

*Course attendance:* Attendance is expected for each class meeting, as it will help you better understand the concepts covered in lectures. If you miss a class, you are responsible for any assignments/announcements made/material covered. No attendance grade will be calculated, but attendance be taken into consideration when assessing participation (though attendance alone is not sufficient for a high participation grade).

*Participation:* We strongly encourage you to actively participate in class discussions; ask questions or ask for more explanations whenever you feel confused; in this class there is NO stupid question! If you are thinking it, odds are someone else is as well. Participation grade will be assessed from attendance, active participation in class, in ICON discussion, and potentially by attending office hours or review sessions.

*Help:* You are always welcome to come to our office hours or stop by outside of office hours if we are around. You may also make an appointment. Another *excellent* resource is the Math Lab is located in 125 MLH. It is staffed by very knowledgeable math graduate students. Math Lab services are FREE. For more information and hours, please go to http://www.math.uiowa.edu/math-tutorial-lab.

*Changing grade policy:* If we agree to change your grade on a homework, quiz, or exam it is your responsibility to remind us in the same day by e-mail that we have agreed to change your grade.

*Cell phones policy:* We are expecting you to NOT use your cell phones, iPads, or computers during the lecture time for other purposes than class related.

*Complaint procedure:* Any student having a problem with the course should contact the instructor; sooner is better. Most issues can be resolved with a straightforward discussion. Please read the notes to the student below.

*Calculators:* You may not use a calculator during tests and quizzes, and we encourage you not to use one while doing homework. Tests and quizzes will be designed so that calculators are not necessary.

**Resources for Students:**
Students will find the Writing Center and the Speaking Center very useful for this course:
Writing Center: http://www.uiowa.edu/~writingc/
Speaking Center: http://clas.uiowa.edu/rhetoric/for-students/speaking-center
Math Tutorial Lab: 125 MLH http://www.math.uiowa.edu/math-tutorial-lab

**Syllabus Change Policy:**
The instructor reserves the right to make changes to this syllabus at any time.

**COLLEGE OF LIBERAL ARTS AND SCIENCES**
**Information for CLAS Undergraduates**
**Spring 2022**

**ATTENDANCE AND CLASSROOM EXPECTATIONS**
Students are responsible for attending class and for knowing an instructor's attendance policies, which vary by course and content area. All students are expected to attend class and to contribute to its learning environment in part by complying with University policies and directives regarding appropriate classroom behavior or other matters.

**ABSENCES**
Students are responsible for communicating with instructors as soon they know that an absence might occur or as soon as possible in the case of an illness or an unavoidable circumstance. Students can use the CLAS absence form to help communicate with instructors who will decide if the absence is excused or unexcused; the form is located on ICON within the top banner under "Student Tools." Delays by students in communication with an instructor could result in a forfeit of what otherwise might be an excused absence (https://clas.uiowa.edu/students/handbook/attendance-absences).

**ABSENCES: ILLNESS, UNAVOIDABLE CIRCUMSTANCES, AND UNIVERSITY SPONSORED ACTIVITIES**
Students who are ill, in an unavoidable circumstance affecting academic work, or who miss class because of a University sponsored activity are allowed by UI policy to make up a missed exam. Documentation is required by the instructor except in the case of a brief illness. Students are responsible for communicating with instructors as soon as the absence is known (https://opsmanual.uiowa.edu/students/absences-class#8.1).

**ABSENCES: HOLY DAYS**
The University is prepared to make reasonable accommodations for students whose religious holy days coincide with their classroom assignments, test schedules, and classroom attendance expectations. Students must notify their instructors in writing of any such Religious Holy Day conflicts or absences within the first few days of the semester or session, and no later than the third week of the semester. If the conflict or absence will occur within the first three weeks of the semester, the student should notify the instructor as soon as possible. See Operations Manual 8.2 Absences for Religious Holy Days for additional information.

**ABSENCES: MILITARY SERVICE OBLIGATIONS**
Students absent from class due to U.S. veteran or U.S. military service obligations (including military service-related medical appointments, military orders, and National Guard Service obligations) must be excused without penalty. Instructors must make reasonable accommodations to allow students to make-up exams or other work. Students must communicate with their instructors about the expected possibility of missing class as soon as possible. (For more information, see https://opsmanual.uiowa.edu/iv-8-absences-class%C2%A0-0).

**ACADEMIC MISCONDUCT**
All undergraduates enrolled in courses offered by CLAS have in essence agreed to the College's Code of Academic Honesty. Academic misconduct affects a student's grade and is reported to the College which applies an additional sanction, such as suspension. Outcomes about misconduct are communicated through UI email (https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code).

**ACADEMIC ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**
The University is committed to providing an educational experience that is accessible to all students. If a student has a diagnosed disability or other disabling condition that may impact the student's ability to complete the course requirements as stated in the syllabus, the student may seek accommodations through Student Disability Services (SDS). SDS is responsible for making Letters of Accommodation (LOA) available to the student. The student must provide a LOA to the instructor as early in the semester as possible, but requests not made at least two weeks prior to the scheduled activity for which an accommodation is sought may not be accommodated. The LOA will specify what reasonable course accommodations the student is eligible for and those the instructor should provide. Note that accommodations are not granted retroactively but from the time of the student's request to the instructor onward. Additional information can be found on the SDS website.

**CLASS RECORDINGS: PRIVACY AND SHARING**
Course lectures and discussions are sometimes recorded or live-streamed. These are only available to students registered for the course and are the intellectual property of the faculty member. These materials may not be shared or reproduced without the explicit written consent of the instructors. Students may not

share these recordings with those who are not enrolled in the course; likewise, students may not upload recordings to any other online environment. Doing so is a breach of the Code of Student Conduct and could be a violation of the Federal Education Rights and Privacy Act (FERPA); also see https://dos.uiowa.edu/policies/code-of-student-life/.

**COMMUNICATION: UI EMAIL**

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community (Operations Manual, III.15.2). Emails should be respectful and brief, with complex matters addressed during the instructor's drop-in hours, for example. Faculty are not expected to answer email after business hours or during the weekends.

**COMPLAINTS ABOUT ACADEMIC MATTERS**

Students with a complaint about a grade or a related academic issue should first visit with the instructor and then with the course supervisor (if one is assigned), and next with the Chair of the department or program offering the course. If not resolved, students may bring their concerns to the College of Liberal Arts and Sciences: https://clas.uiowa.edu/students/handbook/student-rights-responsibilities.

**FINAL EXAMINATION POLICIES**

The final exam schedule is published during the fifth week of the fall and spring semesters or on the first day of summer classes; students are responsible for knowing the date, time, and place of their final exams. Students should not make travel plans until knowing this information. A student with exams scheduled on the same day and time or who have more than two final exams on the same day should visit this page for how to resolve these problems by the given deadline: https://registrar.uiowa.edu/makeup-final-examination-policies. No exams may be scheduled the week before finals; some exception, however, have been made for labs, language courses, and off-cycle courses (https://registrar.uiowa.edu/final-examination-scheduling-policies).

**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 of the classroom. Visit Free Speech at Iowa for more information on the University's policies on free speech and academic freedom (https://freespeech.uiowa.edu/).

**HOME OF THE COURSE**

The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the course's add and drop deadlines, the "second-grade only" option (SG0), and other undergraduate policies and procedures. Different UI colleges may have other policies or deadlines. See https://clas.uiowa.edu/students/handbook. Questions? Contact CLAS at clasps@uiowa.edu or 319-335-2633.

**MENTAL HEALTH**

Students are encouraged to be mindful of their mental health and seek help as a preventive measure or if feeling overwhelmed and/or struggling to meet course expectations. Students are encouraged to talk to their instructor for assistance with specific class-related concerns. For additional support and counseling, students are encouraged to contact University Counseling Service (UCS). Information about UCS, including resources and how to schedule an appointment, can be found at counseling.uiowa.edu. Find out more about UI mental health services at: mentalhealth.uiowa.edu. Student Health can also address related concerns (https://studenthealth.uiowa.edu/). These visits are free to students. After hours, students are encouraged to call the Johnson County Community Crisis Line at (319) 351-0140 or dial 911 in an emergency.

**NON-DISCRIMINATION STATEMENT**

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 additional information on nondiscrimination policies, contact the Director, Office of Institutional Equity, the University of Iowa, 202 Jessup Hall, Iowa City, IA 52242-1316, 319-3350705, oie-ui@uiowa.edu. Students

may share their pronouns and chosen/preferred names in MyUI, which is accessible to instructors and advisors.

**SEXUAL HARASSMENT**

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. Information about confidential resources can be found here. Watch the video for an explanation of these resources.