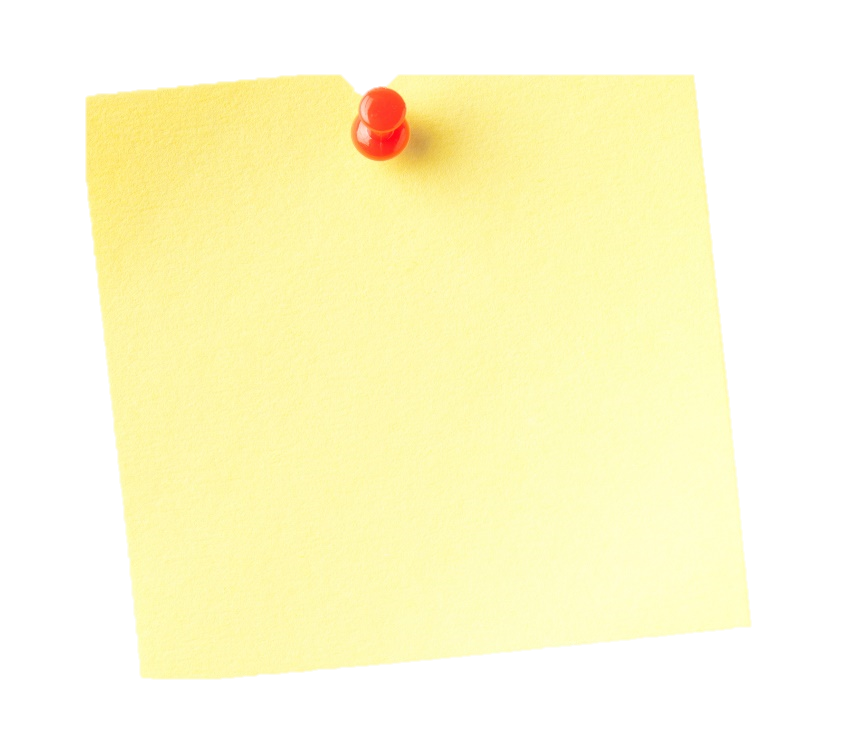
**TO STUDENTS** Note: Print a copy of this syllabus for easy reference about due dates, grading scale, and helpful links for student support. The syllabus is considered to be the ruling document, but dates could change for various reasons. If changes are made, you will be notified.

Course Syllabus

# MA 441-1M Advanced Calculus 1

## Spring 2023



## 

## Instructor Name: Shannon Starr

## Email: slstarr@uab.edu

## Phone: 934-8557 (prefer email)

## Office Location: University Hall 4008

## Student Hours (Office Hours)

Email is the preferred method of contact if you have questions. Please expect a response within 24 hours on weekdays and a slower response on weekends (OR Emails received after 5 pm on Friday will be returned Monday morning). Include <*prefix, course number, and section code*> in the subject line of your email for a faster response. I am available to meet with you in person or virtually via Zoom by appointment. I look forward to seeing you during student hours (see below for my scheduled student hours).

Mon, Wed, Friday : 12-12:50pm

Office hours will be in person in UH 4008. (Office hours at other times and/or by Zoom available by appointments upon request)

# Instructional Method

Face-to-Face:This class will be conducted in person, on campus, on the days and times listed in the course schedule. Safety measures must be followed as required by the University. As described below, there may be online elements to the course.

# Course Information

## Course Description

This course covers basic topics proofs of the theorems related to calculus. A main example to consider is the intermediate value theorem : for a function which is continuous on the closed interval [0,1] if its value at 0 is negative and its value at 1 is positive then there must be a point in the open interval (0,1) where the value of the function equals 0. In the fall semester we work through the model of the real numbers (for example using infinite decimal expansions). We also consider the convergence theorems for sequences and series.

## Course Objectives

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

1. Prove a theorem, yourself.
2. Present your theorem to your classmates in a clear and concise way.
3. Answer any questions or challenges that arise during your presentation.
4. Prove the basic results from advanced calculus, such as the convergence criteria for sequences and series of real numbers.
5. Be prepared to follow-up, in a second semester course, to prove the main theorems for integrals and derivatives of functions.

## Prerequisites and/or Corequisites

MA 440 with a grade of C or better.

## Required Text and Course Materials

There is no textbook for this class. The class presentation style is IBL. That stands for inquiry based learning. There will be a list of theorems written each week by the instructor, and you choose which theorems you want to prove and present for class the following week. All class time is spent with students presenting their proofs of the theorems. Students are not allowed to look up proofs in textbooks. So no textbook is suggested. At the end of the semester, I will suggest textbooks for further reading.

## Optional Texts or Resources

Not applicable: see above.

# Course Grading and Policies

## Late Assignment Policy

After you present your proof, you are required to upload a picture of your written proof to the Canvas website. Usually, we will send out a reminder if you are late in uploading it. After the warning, late assignments are eligible for a 10% deduction of original points for each day that they are late, up to 5 days. If the need arises, you must have a legitimate reason to receive a deadline extension, and you should contact your instructor as soon as you know that you will not be able to meet the deadline. If you contact your instructor at the last minute, you may not be granted an extension.

## Grading Scale

The following scale will be used to determine final grades.

A = 100-90% B = 80-89% C = 70-79% D = 60-69% F = < 60%

The instructor reserves the right to alter the grading scale to make it more progressive, in the following sense: make a vector (x,y,z,w) such that any student whose grade is x or above receives a grade which is A or above, any student whose grade is y or above receives a grade which is B or above, et cetera. Then based on class statistics the instructor reserves the right to change this vector to (x’,y’,z’,w’) such that x’<x, y’<y, z’<z and w’<w. So that would mean some students may receive better grades, and no students would receive worse grades.

## **Rounding Policy**

Grades will not be rounded. We use probability/statistics understanding of using lower cut-offs for grades.

## Student Access to Grades

Part of the IBL methodology is that students with the fewest points are allowed to present first. For this reason, a spreadsheet will be maintained on Canvas with a list of all the theorems proved so far, and which student presented their proof in class for each theorem. The only component of the grade is the points accumulated by presenting your proofs in class. You can see your grade by checking that spreadsheet at any day of class.

## Graded Assignments and Activities Overview

|  |  |
| --- | --- |
| Assignments and Activities | Value |
| In-class presentations | 100 |
| Total | 100 |

## **Assignments and Activities Descriptions**

Each week a list of theorems, without proofs, will be provided. Each student chooses any number of theorems to prepare. You derive your own proof, and volunteer to present. Any student who successfully presents their theorem without any challenges that causes them to “sit down” is entitled to 10 points for the theorem. (If several students work together the 10 points may be divided between them, according to rules on a rule sheet which will be handed out on the first day of class.) To earn those points, you must upload a picture of your written proof to Canvas. Students proving later theorems will often consult the uploaded pictures of other students previous theorems. So you must upload your pictures of your proofs quickly after receiving credit for presenting a valid proof.

We will discuss the total number of points required in a semester during the first day of class. The baseline has typically been 120/(enrollment) theorems to be proved for each student in the entire semester. So that would be 10 theorems per student, or 100 points to get full credit for the highest A. We will discuss this in more detail on the first day of class.

Attendance is not mandatory, but you cannot present your proof without attending. Also, a tally of absences is kept. After 10 absences you must present a proof for 1 extra theorem (and that rule is also applied if any student misses a second 10 classes, and so on).

### Exams

There are no exams in this class.

### In-class Participation Discussions

Lecture style is IBL: inquiry based learning. Students will present in class. The instructor will spend practically no time as the lead presenter in class, except to demonstrate a few times in a single semester. Some students feel they need help before being comfortable enough to present in class. But we have many office hours, and the instructor is happy to help during office hours. Since the in-class presentations are all student led, all of the instructor’s communication time to try to instruct does take place in office hours, which are a key component of class. When presenting try to do the following:

* + State the theorem you are presenting.
  + Prepare a written version of your proof before class.
  + Present your written version of your proof using the document camera in class, and reading aloud as you go.
  + Be prepared to answer any challenges (questions that other students think may invalidate your proof) on the board.
  + Keep your presentation brief. There are many students who want to present each day to get their points. It is best to constrain your presentation just to the required proof, so that you do not take more time than is necessary. You may also come to office hours if you want to discuss your proof with the instructor before presenting.

### Extra credit

There are occasionally theorems for which more than 1 distinct proofs may be available. There are not many such theorems, they are infrequent. When one such theorem arises, the instructor reserves the right to allow extra credit points (not to exceed 10 points per theorem) for genuinely alternative proofs, to be written up and submitted at the end of the semester. But the announcement of which theorems are open for such extra credit points will be made during the last 3 weeks of class, only.

# Prepare for Online Success

|  |  |
| --- | --- |
| Course Netiquette [Screenshot of Course Netiquette video](https://mediaspace.uab.edu/media/Netiquette/1_ikw15pmk) | Tips for Online Success [Screenshot  of Tips for Success Video](https://mediaspace.uab.edu/media/Tips+for+Online+Success/1_shhemlum) |

Online courses require communication and time management skills. Watch the following videos on Netiquette and Online Success. (Because of the videos you will make, these are useful, too.)

# Weekly Course Schedule

|  |  |  |
| --- | --- | --- |
| Time Commitment You are expected to spend a substantial amount of time working through the course activities and assignments every week. Please know that time management and self-motivation are key components for success in this course and courses in general. There is a lot to be gained in this course, so approach it with an open mind and lots of fun!  This class meets three times per week for 50 minutes each time. In addition to class time, you should spend at least 4 hours per week reading and studying the proofs of other students already presented and preparing your own proofs. There are 3 hours of office hours per week for this class, which is more than usual. Take advantage of it. Do not take the workload in this course for granted. |  | Course Time Zone All assignment deadlines listed on this syllabus are in Central Time. If you are in a different time zone, including any traveling, you are responsible for calculating the time difference and submitting assignments or attending online meetings on time. Use the [**World Official Time Zone Site**](https://24timezones.com/#/map)as a reference. |

| **Week/Module** | **Assignments and Activities** | **Due Dates** |
| --- | --- | --- |
| **Week 1: Introduction** | * Review the course syllabus * Review the rules for the class including the IBL methodology. * Start class presentations. | *Each class period students will be asked to volunteer to present their theorems. Students get points as they successfully present a proof. Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 2:** | * Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 3:** | * Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 4:** | * Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 5:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 6:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 7:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 8:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 9:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 10:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 11:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 12:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 13:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 14:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Week 15:** | Do class presentations | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |
| **Finals week** | Last chance for make-up presentations to raise grades. The final exam schedule says 1:30pm-4pm in our classroom. | *Each class is an opportunity to earn points for the final grade. Each class is a “due date.”* |

# UAB Policies and Resources

## Add/Drop and Course Withdrawal

* Drop/Add: Deadlines for adding, dropping, or withdrawing from a course and for paying tuition are published in the [Academic Calendar](https://www.uab.edu/students/academics/academic-calendar) available online. Review the [Institutional Refund Policy](https://www.uab.edu/students/one-stop/policies/institutional-refund-policy) for information on refunds for dropped courses. It is the student’s responsibility to initiate add/drop procedures. Students may drop and add courses online after they have registered and until the drop/add deadline online using [BlazerNET](http://www.uab.edu/blazernet).
* Withdrawal: To avoid academic penalty, a student must withdraw from a course by the withdrawal deadline shown in the academic calendar and receive a grade of “W” (withdrawn). Failure to attend class does not constitute a formal drop or withdrawal. The official course withdrawal must be completed online in [BlazerNET](http://www.uab.edu/blazernet).

## Academic Integrity Code

Your success while at UAB and after graduation is valued by the University. To gain and grow in the knowledge and skills needed for your future career, it is vital that you complete your own work in your courses and in your research. The purpose of the [**Academic Integrity Code**](https://www.uab.edu/one-stop/policies/academic-integrity-code) is to support our academic mission and to maintain and promote academic integrity. All students in attendance at UAB are expected to pursue all academic endeavors with integrity, honor, and professionalism and to observe standards of conduct appropriate to a community of scholars.

Please be sure you understand the different forms of "academic misconduct" covered by the code. Review the [**FAQs about the code**](https://www.uab.edu/faculty/resources/academic-integrity-code) for details.

## Student Conduct Code

The purpose of the University of Alabama at Birmingham (“University”) student conduct process is to support the vision, mission, and shared values of the University and the tenets of the University’s creed, The Blazer Way. Through a student-focused and learning-centered lens, the process strives to uphold individual and community standards; foster an environment of personal accountability for decisions; promote personal growth and development of life skills; and care for the well-being, health, safety, and property of all members of the University community.

The [**Student Conduct Code**](https://www.uab.edu/students/accountability/policies/student-conduct-code) (“Code”) describes the standards of behavior for all students and student organizations and outlines students’ rights and the process for adjudicating alleged violations. It is set forth in writing in order to give general notice of non-academic prohibited conduct. The Code should be read broadly and is not designed to define non-academic conduct in exhaustive terms. All students and student organizations are expected to conduct themselves in accordance with the Code. The current version of the Code, which may be revised periodically, is available from the Office of Community Standards & Student Accountability.

## Intellectual Property

My lectures and course materials, including PowerPoint presentations, quizzes, exams, outlines, and similar materials, are protected by copyright. You may take notes and make copies of course materials for your own use. You may not and may not allow others to reproduce or distribute lecture notes and course materials publicly, whether or not a fee is charged, without my expressed written consent.

## DSS Accessibility Statement

Accessible Learning: UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration, and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact me to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call (205) **934-4205** or visit [**the DSS website**](http://www.uab.edu/dss).

## Title IX Statement

The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct, we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit **the** [**UAB Title IX webpage**](http://www.uab.edu/titleix) for UAB’s Title IX Sex Discrimination, Sexual Harassment, and Sexual Violence Policy; UAB’s Equal Opportunity and Discriminatory Harassment Policy; and the Duty to Report and Non-Retaliation Policy.

## Technology

Access technical support and view privacy policies and accessibility statements for Canvas and other technologies on the [**Student Academic Technologies website**](https://www.uab.edu/elearning/academic-technologies). Additionally, view information about the [**Minimum System Requirements and Technical Skills**](https://www.uab.edu/elearning/technology-resources).

## Health and Safety

UAB is very concerned for your continued health and safety. Please consult the Students section of [**UAB United**](https://www.uab.edu/uabunited/) for up-to-date guidance because the following information is subject to change as circumstances require.

We strongly urge you to be fully vaccinated**.** [**Here is information on the safety of vaccines and on how to get vaccinated at UAB.**](https://www.uab.edu/uabunited/covid-19-vaccine) Mask-wearing has proven to be one of the most successful mitigation strategies used to combat spread of the various variants of the COVID-19 virus. Please check UAB United for mask-wearing requirements and other safety protocols for this semester.

Know the resources available to you to be successful:

* [**Student Assistance and Support**](https://www.uab.edu/students/assistance/about) provides individualized assistance to promote student safety and well-being, collaboration and resilience, personal accountability, and self-advocacy. The Care Team consults and collaborates with campus partners to balance the needs of individual students with those of the overall campus community. [**The UAB Care Team**](https://www.uab.edu/careteam/) helps find solutions for students experiencing academic, social, and crisis situations including mental health concerns.
* [**Disability Support Services**](https://www.uab.edu/students/disability/about)assists students with in reaching accommodations for their educational experiences at UAB that ensure that they have equal access to programs, services, and activities at UAB.
* The [**Vulcan Materials Academic Success Center**](https://www.uab.edu/students/academics/student-success) provides tutoring, supplemental instruction, and other services that encourage goal achievement and degree completion.
* [**UAB Student Health Services**](https://www.uab.edu/students/health/) delivers comprehensive, high quality, confidential, primary healthcare to students. Student Health provides testing services and vaccination clinics.
* [**Student Counseling Services**](https://www.uab.edu/students/counseling/our-services) offers students a safe place to discuss and resolve issues that interfere with personal and academic goals. UAB has created a new app (available in the App Store and Google Play) called [**B Well**](https://www.uab.edu/reporter/resources/be-healthy/item/9404-blazer-created-mental-health-app-puts-wellness-in-student-hands), that is designed to easily access resources on mobile devices and build a self-care plan. [**Kognito**](https://www.uab.edu/uabcares/kognito) is a free, interactive simulation-based platform designed to help you talk with someone when you are worried about your mental health.

* **[eLearning and Professional Studies](https://www.uab.edu/elearning/students" \t "_blank)** provides numerous academic technologies and learning resources for students whose learning may be affected by COVID.

The following are the various websites describing additional student academic and technology resources:

* **[UAB Policies for Students](https://www.uab.edu/elearning/policies)**
* [**Student Academic and Support Services**](https://www.uab.edu/elearning/student-services)
* [**Technology Resources**](https://www.uab.edu/elearning/technology-resources)

See also the[**Student Assistance & Support**](https://www.uab.edu/students/assistance/resources/covid-19) website of Student Affairs for a description of Covid-19-related resources, including the laptop loaner program.

[](https://www.uab.edu/uabunited/students/academics)