



SYLLABUS

MTH 121 LR Section VT (21164)
Survey of Calculus and Its Applications 1

Fall Semester 2019

SUNY University at Buffalo
Mathematics Department





INSTRUCTOR INFORMATION



Michael Casper

Michael Casper

Instructor

SUNY University at Buffalo
Mathematics Department

Office: 222 Mathematics Building

Office Hours: Conducted both online and in-person. See the applicable office hour section of the course handbook for more details.

Email: mjcasper@buffalo.edu

Contact



Alex Becerra

Alex Becerra

Teaching Assistant

SUNY University at Buffalo
Mathematics Department

Office: 106 Mathematics Building

Office Hours: Mondays 4-5pm and Fridays 3-4pm

Email: ajbecerr@buffalo.edu

Contact





COURSE INFORMATION

Prerequisites

1. MTH 115, ULC 148, or NYS Regents Course B required for registration.
2. [ALEKS](#) - Only students who have passed ALEKS with a score of 61 or better are eligible to complete this course (this restriction only applies to the Fall and Spring Semesters).

Delivery Mode

This is an online course with in-person exams.

Required Hardware

1. Textbook - L. Goldstein, D. Schneider, D. Lay, and N. Asmar, *Calculus and Its Applications*.
 - The 5th custom UB edition is the official version.
 - The 4th custom UB edition is also sufficient.
 - The standard 13th and 14th editions are also sufficient.
2. Computer with an up-to-date internet browser.
3. Internet Connectivity: consistent access to high speed internet for the duration of the course.
4. Calculator: **Texas Instruments TI-30XIIS** (this is the only calculator allowed on the exams)

Required Software

1. **This Course Website** – This is the main portal for our class. It contains the syllabus and all information regarding lectures and assignments.

2. **UBlearns** – Our course UBlearns page will be used as a place to post announcements, grades, and any other sensitive information while the course is in progress.
3. **Piazza** – The online discussion board for our class. (free)
4. **Zoom** – Video conferencing software for the online recitations. (free)
5. **Webex** – Video conferencing software for the online recitations that we may trial later on in the year. (free)
6. **WeBWork** – The online homework system for our class. It is a free system sponsored by the Mathematical Association of America (MAA) with a server right on campus in the UB Math Department. (free)

Recommended Software

1. [Geogebra](#) Very nice graphing software. (free)
2. [WolframAlpha](#) Website that provides nice computational and graphical services in a search engine format. (free)
3. [Maple](#), [Mathematica](#), or [Matlab](#) These are heavy duty computational programs (more than we really need) but some of them are free to download as a UB student.

Course Description

For students in social, biological, and management sciences. Limits, continuity, differentiation of algebraic and exponential functions; applications; introduces integration. This course is a controlled enrollment (impacted) course. Students who have previously attempted the course and received a grade other than W may repeat the course in the summer or winter; or only in the fall or spring semester with a petition to the College of Arts and Sciences Deans' Office. To help students achieve greater success, all new UB students are required to complete the ALEKS math assessment tool. New and continuing UB students seeking to enroll in MTH 121 must complete the ALEKS assessment tool within the last 12 months and achieve a required score of 61 as a prerequisite. (ALEKS is not required in Summer/Winter).





ASSESSMENTS

Overview

Your final grade will be determined by your performance on the following assessments: Homework Assignments, the Exam Registration Form, Midterm Exams, and the Cumulative Final Exam.

Homework

On average, there will be approximately 2-4 problem sets assigned each week. They will be posted on our course website each Tuesday and due the following Tuesday at 11:59pm ET. Your grade for each individual homework set will be calculated as the percentage of your correct answers. Your final Homework grade, will then be calculated as the equally weighted average of these individual homework set scores.

Exam Registration Form

The exam registration form is how you communicate to the instructor where you will be taking each of your exams. It is extremely important that you fill this out correctly and by the deadline. Please see the [Exam Registration](#) section of the Course Handbook for further instructions on how to complete this form.

Midterm Exams

There are three paper-based midterm exams given on the dates listed in the [Course Schedule](#). Your lowest midterm exam score will be dropped. These exams must be taken **in-person**.

either at UB or an instructor approved off-campus testing center. Please note the exams are not administered online but rather in a paper-based format.

Midterm Exam 1

Content: Ch.0 - Ch.1

Date: Thursday, September 26, 2019

Time: 8:45pm-10:15pm ET - (it is a 1.5 hour exam)

Location: To Be Determined (room Knox 20 if taken at UB)

Midterm Exam 2

Content: Ch.2 - Ch.4

Date: Thursday, October 24, 2019

Time: 8:45pm-10:15pm ET - (it is a 1.5 hour exam)

Location: To Be Determined (room Knox 20 if taken at UB)

Midterm Exam 3

Content: Ch.4 - Ch.6

Date: Thursday, November 21, 2019

Time: 8:45pm-10:15pm ET - (it is a 1.5 hour exam)

Location: To Be Determined (room Knox 20 if taken at UB)

Final Exam

There is one paper-based, cumulative final exam given during Finals Week on the date listed in the [Course Schedule](#). This exam must be taken **in-person** either at UB or an instructor approved off-campus testing center. Please note this exam is not administered online but rather in a paper-based format.

Content: Cumulative

Date: Thursday, December 12, 2019

Time: 7:15pm-10:15pm ET - (it is a 3 hour exam)

Location: To Be Determined (room Knox 109 if taken at UB)





GRADING

Your Course Average

Your final average will be found by averaging your grades with the following weights:

Assessment	Weight
Exam Registration Form	2%
Homework	23%
Highest Midterm Exam	25%
2nd Highest Midterm Exam	25%
3rd Highest Midterm Exam	0%
Cumulative Final Exam	25%

Your Letter Grade

Your final letter grade will be determined from your final average by applying the cutoffs:

Final Average	Letter Grade
93-100%	A
90-93	A-
87-90	B+
83-87	B

Final Average	Letter Grade
80-83	B-
77-80	C+
73-77	C
70-73	C-
65-70	D+
60-65	D
0-60	F

Incomplete Grades

An incomplete grade (I) will only be given under extraordinary circumstances. Additionally, an incomplete will only be given if you have a passing average on all previously graded work in the course.

Some Relevant Course Policies

- [Academic Integrity Policy](#)
- [Attendance Policy](#)
- [Exam Registration Policy](#)
- [Exception Policy](#)
- [Late Policy](#)





SCHEDULE

There are 3 types of dates on our class calendar: Lecture, Exam, and Administrative.

Lecture Dates

On each scheduled lecture date, there will be three items of business:

1. The new Lectures & Homework for that week will be posted by 8:00am ET.
2. The old Lectures & Homework from the previous week are due by 11:59pm ET.
3. **Recitation** will be held at 1-1:50pm (Eastern Time)

The lecture dates represent the recommended pacing of the course. You are required to have **all assigned material** from the previous week completed by the end of that day. This means you should have completed all of the assigned lectures, taken notes, read the corresponding section in the text, completed all assigned graded homework problems, and all assigned ungraded homework problems.

You should set aside a time each day to complete work for this class. Do not save an entire week's worth of work for the due date. You will not have success if you do this regularly!

Exam Dates

The following are all important dates regarding the exams for this course:

- **Exam Date 0**
 - Friday, September 6, 2019 at 11:59pm ET
 - Final deadline for submitting the required Exam Registration Form.
- **Exam Date 1**
 - Thursday, September 26, 2019 at 8:45pm-10:15pm ET
 - Midterm Exam 1 (1.5 hour exam)

- **Exam Date 2**
 - Thursday, October 24, 2019 at 8:45pm-10:15pm ET
 - Midterm Exam 2 (1.5 hour exam)
- **Exam Date 3**
 - Thursday, November 21, 2019 at 8:45pm-10:15pm ET
 - Midterm Exam 3 (1.5 hour exam)
- **Exam Date 4**
 - Thursday, December 12, 2019 at 7:15pm-10:15pm ET
 - Cumulative Final Exam (3 hour exam)

Administrative Dates

A few other important dates to remember:

- **First Official Day of Classes** - Monday, August 26, 2019
- **Last Day to Drop/Add** - Tuesday, September 3, 2019
- **Last Day to Resign** - Friday, November 8, 2019
- **Fall Recess** - Wednesday, November 27, 2019 - Saturday, November 30, 2019
- **Last Day of Classes** - Friday, December 6, 2019
- **Final Grades Published** - Monday, December 23, 2019 by 11:59pm ET





CALENDAR

August

Date	Event Type	Description
Aug 27 (Tue)	Lecture Date 1	Sections 0.1, 0.2, 0.3, 0.4 & Recitation No Lectures & HW are due.

September

Date	Event Type	Description
Sep 3 (Tue)	Lecture Date 2	Sections 0.5, 1.1, 1.2, 1.3 & Recitation No Lectures & HW are formally due.
Sep 6 (Fri)	Exam Date 0	Exam Reg Form Due at 11:59pm ET
Sep 10 (Tue)	Lecture Date 3	Sections 1.4, 1.5, 1.6 & Recitation Lectures & HW from Lecture Dates 1 & 2 due.
Sep 17 (Tue)	Lecture Date 4	Sections 1.7, 1.8, 2.1 & Recitation Lectures & HW from Lecture Date 3 are due.
Sep 24 (Tue)	Lecture Date 5	Sections 2.2, 2.3, 2.4 & Recitation Lectures & HW from Lecture Date 4 are due.
Sep 26 (Thu)	Exam Date 1	Exam 1 (Lectures 1-4)

October

Date	Event Type	Description
Oct 1 (Tue)	Lecture Date 6	Sections 2.5, 2.6, 2.7 & Recitation Lectures & HW from Lecture Date 5 are due.
Oct 8 (Tue)	Lecture Date 7	Sections 3.1, 3.2, 3.3 & Recitation Lectures & HW from Lecture Date 6 are due.
Oct 15 (Tue)	Lecture Date 8	Sections 4.1, 4.2, 4.3 & Recitation Lectures & HW from Lecture Date 7 are due.
Oct 22 (Tue)	Lecture Date 9	Sections 4.4, 4.5, 4.6 & Recitation Lectures & HW from Lecture Date 8 are due.
Oct 24 (Thu)	Exam Date 2	Exam 2 (Lectures 5-8)
Oct 29 (Tue)	Lecture Date 10	Sections 5.1, 5.2 & Recitation Lectures & HW from Lecture Date 9 are due.

November

Date	Event Type	Description
Nov 5 (Tue)	Lecture Date 11	Sections 6.1, 6.2 & Recitation Lectures & HW from Lecture Date 10 are due.
Nov 12 (Tue)	Lecture Date 12	Sections 6.3, 6.4 & Recitation Lectures & HW from Lecture Date 11 are due.
Nov 19 (Tue)	Lecture Date 13	Sections 6.5 & Recitation Lectures & HW from Lecture Date 12 are due.
Nov 21 (Thu)	Exam Date 3	Exam 3 (Lectures 9-12)
Nov 26 (Tue)	Lecture Date 14	Further Applications of Calculus & Recitation Lectures & HW from Lecture Date 13 are due.

December

Date	Event Type	Description
Dec 3 (Tue)	Lecture Date 15	Further Applications of Calculus & Recitation Lectures & HW from Lecture Date 14 are due.
Dec 12 (Thu)	Exam Date 4	Cumulative Final Exam Lectures & HW from Lecture Date 15 are due.





COURSE POLICIES

Academic Integrity

Students must be familiar with and abide by the university's policies and procedures on [Academic Integrity](#). Any violation of this policy will be pursued to the fullest extent of university policy.

Attendance Policy

- **Technological Attendance:** We will be using UBlerns and UBmail (email) for all official course communications. It is required that you check both of these platforms daily.
- **Lecture Attendance:** You are expected to watch all assigned lecture videos in their entirety by the assigned lecture date. Attendance records will be kept and used when evaluating make-up exam requests.
 - **Satisfactory Lecture Attendance:** is defined to be a completion rate of 90% or higher for each week's lecture videos by the assigned due date. The completion rate is the amount of time spent watching the video relative to the total length of the video.
- **Recitation and Office Hour Attendance:** Attendance in the recitations and office hours (discussion board) is initially optional although highly recommended.

Attendance Policy Rider

The instructor reserves the right to make lecture and/or recitation and/or office hour attendance a mandatory requirement for any student whose average in the course drops to a C+ or below at any point during the semester. You will receive an email notification from the

instructor if this happens to you. If you do receive such a notification you will be required to maintain one or both of the following:

- satisfactory lecture attendance (defined above)
- weekly attendance at a scheduled recitation or office hour

These additional requirements must then be met in order for you to take any applicable exams. In the event that you do not meet the attendance requirement as stated in the email notification, you will automatically receive a grade of 0 for that exam. The email notification will explicitly list all additional requirements and applicable exams.

Calculator and Reference Policy

1. The **Texas Instruments TI-30XIIS** is the only authorized calculator allowed on the midterm and final exams. If you are caught with any other type of calculator during an exam, you will receive a grade of 0 for that exam and an academic integrity case will be initiated.
2. Outside references of any kind (e.g., cheat sheets, note cards, textbook) are not allowed on the midterm and final exams. If you are caught with any type of outside reference during an exam, you will receive a grade of 0 for that exam and an academic integrity case will be initiated.

Copyright Policy

All course material is protected under applicable copyright law and the academic integrity policy of the university.

- **Unauthorized Distribution:** Reproduction and distribution of material is prohibited without the instructor's consent. Copies may be made for private, individual study, but should not be shared with unauthorized users.
- **Unauthorized Possession:** Possession of any material from previous courses is prohibited.

Any violation of this policy will be pursued to the fullest extent allowable by law and university policy.

Curve Policy

All grades are calculated as described in the grading section of this syllabus. There is no curve in this course. Homework assignments and exams are designed to assess your individual understanding of the learning outcomes. Your grade is completely within *your control* and based solely on *your performance*.

Email Policy

It is required that your university (buffalo.edu) email address be used for all official course email correspondence.

While we encourage everyone to ask questions, email should only be used for personal matters. **Any questions related to the course that are not of a personal nature should be asked on the discussion board or during recitation or in-person office hours.** Please allow 72 hours during the work week for a response from the instructor. Emails will not be answered over the weekend.

Exam Date and Time Policy

- **Date:** All exams must be taken on the scheduled exam day.
- **Time:** All exams must be started at the scheduled time. If you have another class during the scheduled exam time, you must notify the instructor of this conflict through the Exam Registration Form.

Exam Location Policy

It is the student's responsibility to find a testing facility, schedule an appointment with this facility, and obtain instructor approval of their arrangements. The testing facility does not need to be the same for every exam.

Every student has two options for where to take each exam :

- **On-campus at UB** - This is included with your tuition.

- If you are taking an exam at UB, the testing arrangements have already been made for you. However, you still need to fill out the exam registration form.
- **An approved testing facility outside of UB** - The testing site might charge an extra fee.
 - The testing facility must be located in the US or Canada.
 - The testing facility should be in a university or college although alternative locations will be considered on a case-by-case basis. In almost all cases, public libraries and high schools are not acceptable test sites and will not be approved.
 - The testing facility should have a dedicated, unbiased proctor that will be present for the duration of the exam.

Exam Make-up Policy

Make-up exams will only be given in the event of an emergency situation, religious holiday, or conflict with another regularly scheduled class. Please note that “having a cold” or “not feeling well” does not constitute an emergency situation. In addition to a compelling and serious reason, all make-up exam requests must meet the following requirements:

- **Written Documentation:** All requests for a make-up exam must provide written documentation of the situation. If you cannot provide written documentation, you will not be allowed to make-up the exam.
- **Student Health Services (Michael Hall):** Does not formally excuse students from class and does not provide supporting written documentation. Any request for a make-up exam with only Student Health Services as a reference will be denied.
- **Satisfactory Progress:** Any student requesting a make-up exam should be making satisfactory progress in the course at the time of their request. This means they should have satisfactory lecture attendance and at least a 70% Guided Lecture average on the applicable assignments. Any student below either of these thresholds will have their request denied.
- **Timeliness:** All exams must be made up by the end of the 1st business day following the date of the original exam. This deadline may be extended at the instructor’s discretion for truly extenuating circumstances.

Exam Registration Policy

Everyone, regardless of where they are taking the exam, needs to complete the exam registration form.

- Failure to complete the exam registration form by the required deadline and subsequently obtain instructor approval of your exam arrangements will result in an “F” in the course.

Exam Regrade Policy

Any request for an exam regrade must be made within 10 business days of the original exam date.

- This is a complete regrade of the exam, with the possibility that questions originally marked correct might be changed to incorrect (so it is possible that your exam score might go up, stay the same, or be lowered in the process).

Exception Policy

Requests for exceptions to any policy or grading assessment described in this syllabus will not be granted. This is to ensure that all students are given equal opportunity to succeed in this class and are all graded by the same set of standards.

Fees

Your chosen testing site might charge you an extra fee for their proctoring services. This fee is the student's responsibility. If you take the exams at UB there is no fee beyond the normal fees charged with your tuition.

Late Policy

All assignments are due by the posted due date and time. Late submissions will not be accepted; deadlines will not be extended for any reason.

- Do not save homework assignments until the last minute. There might be a slight difference in the server clock time with your local clock time.

Once a problem set closes, it will not be reopened for any reason.

Office Hour Policy

Participation with the discussion board and office hours in general is initially optional and will not be graded; although it is highly recommended. If your average in the course drops to a B- or below at any point during the semester this policy may be changed at the instructor's discretion. Please see the Attendance Policy and Attendance Policy Rider for further details.

You can post questions on the discussion board at any time. However, please be advised that questions will usually be answered during normal business hours (9-5pm). It is our goal to have all questions answered within 24 hours during the work week (but most likely much sooner).

- If you choose to participate in the discussion board it is expected that:
 - You are up-to-date on all lecture material and readings.
 - Your discussion board post follows all correct formatting guidelines.
- If you choose to participate in the in-person office hours it is required that:
 - You have both watched and taken notes on the lecture material up through that day.
 - You come prepared with your notes and some attempted homework solutions, all nicely organized.
 - The instructor reserves the right to check your lecture notes for completion at any time during office hours. You may be asked to leave if your notes are found to be incomplete.

Recitation Policy

Attendance is initially optional and will not be graded; although it is highly recommended. If your average in the course drops to a B- or below at any point during the semester this policy may be changed at the instructor's discretion. Please see the Attendance Policy and

Attendance Policy Rider for further details. If you choose to participate in a recitation it is required that:

- You have both watched and taken notes on the lecture material up through that day.
- You come prepared with your notes and attempted homework solutions readily available.

Please be aware that:

- The instructor reserves the right to check your lecture notes for completion at any time during the recitation. You may be asked to leave if your notes are found to be missing or incomplete.
- Each online recitation will be recorded and posted in the Recitation Archive.





FURTHER INFORMATION

Accessibility Resources

If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the [Office of Accessibility Resources](#) in 60 Capen Hall, 716-645-2608 and also the instructor of this course during the first week of class. The office will provide you with information and review appropriate arrangements for reasonable accommodations.

Changes to the Syllabus

This syllabus is subject to amendments as needed. Changes will be announced to the class electronically via email and posted on the course UBlerns page.

Controlled Enrollment Courses

This is a Controlled Enrollment Course. If you need to repeat this course in the future (because you failed it, resigned from it, etc. at the first attempt) you may be forced to do it in a UB summer or winter session. Registering to repeat this course in a Fall or Spring semester may be difficult or impossible. For more information see the [Repeat Policy in the UB Undergraduate Catalog](#).

Critical Campus Resources

Sexual Violence

UB is committed to providing a safe learning environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence and stalking. If you have experienced gender-based violence (intimate partner violence, attempted or completed sexual assault, harassment, coercion, stalking, etc.), UB has resources to help. This includes academic accommodations, health and counseling services, housing accommodations, helping with legal protective orders, and assistance with reporting the incident to police or other UB officials if you so choose. Please contact UB's Title IX Coordinator at 716-645-2266 for more information. For confidential assistance, you may also contact a Crisis Services Campus Advocate at 716-796-4399.

Mental Health

As a student you may experience a range of issues that can cause barriers to learning or reduce your ability to participate in daily activities. These might include strained relationships, anxiety, high levels of stress, alcohol/drug problems, feeling down, health concerns, or unwanted sexual experiences. Counseling, Health Services, and Health Promotion are here to help with these or other issues you may experience. You can learn more about these programs and services by contacting:

- Counseling Services
 - 120 Richmond Quad (North Campus), 716-645-2720
 - 202 Michael Hall (South Campus), 716-829-5800
- Health Services
 - Michael Hall (South Campus), 716-829-3316
- Health Promotion
 - 114 Student Union (North Campus), 716-645-2837

Portfolio

If you are completing this course as part of your UB Curriculum requirements, please select an 'artifact' from this course that is representative of your learning and upload it to your UBPortfolio account. Templates have been created for this purpose. Artifacts include homework assignments, exams, research papers, projects, lab reports, presentations, and other course materials. Your final UB Curriculum requirement, UBC 399: UB Curriculum Capstone, will require you to submit these 'artifacts' as you process and reflect on your achievement and growth through the UB Curriculum. For more information, see the [UB Curriculum Capstone website](#).





LEARNING OUTCOMES

Unit 1

The following learning outcomes will be assessed in the **Homework, Midterm Exam #1, and Final Exam**:

1. Recognize linear, polynomial, rational, and power functions, understand their basic properties and know how to evaluate them.
2. Compute zeros of quadratic functions.
3. Compute limits of algebraic functions graphically, numerically, and algebraically.
4. Interpret the derivative graphically as the slope of the tangent to the graph of a function and algebraically as the limit of difference quotients.
5. Compute derivatives of basic algebraic functions.

Unit 2

The following learning outcomes will be assessed in the **Homework, Midterm Exam #2, and Final Exam**:

1. Use limits and derivatives to construct, analyze, and interpret the graph of a function.
2. Use derivatives to analyze and solve applied optimization problems.
3. Compute the first and higher order derivatives using derivative rules, including the chain rule and implicit differentiation.

Unit 3

The following learning outcomes will be assessed in the **Homework, Midterm Exams #2-3, and Final Exam**:

1. Simplify algebraic expressions involving exponents and logarithms.
2. Compute derivatives of exponential and logarithm functions.

Unit 4

The following learning outcomes will be assessed in the **Homework, Midterm Exam #3, and Final Exam**:

1. Use exponential functions and logarithms in problems involving compound interest rates, and exponential growth and decay.
2. Compute indefinite and definite integrals of basic functions using anti-derivative rules and the fundamental theorem of calculus.
3. represent area as a definite integral and interpret the result in applications.

Meta

The following learning outcomes will be assessed in **all Homework, Midterm Exams #1-3, and the Final Exam**:

1. Choose appropriate methods or models for a given problem, using information from observed or deduced data and knowledge of the system being studied.
2. Employ quantitative methods, mathematical models, statistics, and/or logic to solve real-world problems beyond the level of basic algebra.
3. Identify common mistakes and/or limitations in empirical and deductive reasoning, and in mathematical, quantitative, and/or logical problem solving.
4. Interpret mathematical models, formulas, graphs, and/or tables, to draw inferences from them, and explain these inferences.

