MTH 201 Calculus I

INSTRUCTOR INFORMATION
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TEXT AND READINGS
Calculus: Single Variable, 7th ed., by Hughes-Hallett, Gleason, McCallum, et al, (Wiley 2017). We have a custom text which is not the same as the traditional Hughes-Hallett text. Ours contains only those sections we will be covering.

TECHNOLOGY
A graphing calculator is recommended. The TI-83, TI-84, TI-86, TI-89, or TI-Nspire series are highly recommended.

We will be using an online system, WeBWorK, for some homework. There are instructions on how to use the system on our course webpage.

COURSE/BULLETIN DESCRIPTION
The study of differential and integral calculus with emphasis on applications in the natural and physical sciences. We will introduce the calculus through classical problems; we shall emphasize the theoretic development in both historical and rigorous modern contexts. (Prerequisite: MTH 112 or permission of instructor.)

COURSE OUTLINE
Ch. 1	A Library of Functions	prerequisite, though we will cover §1.7 and §1.8 in depth
Ch. 2	Key Concept: The Derivative	§2.1-2.6
Ch. 3	Short-Cuts to Differentiation	§3.1-3.7, 3.9, 3.10
Ch. 4	Using the Derivative	§4.1-4.4, 4.6-4.8
Ch. 5	Key Concept: The Definite Integral	§5.1-5.4
Ch. 6	Constructing Antiderivatives	§6.1-6.4

COURSE PERFORMANCE OBJECTIVES
Almost all the mathematics learned in high school comes to bear in elementary calculus.

In MTH 201, Calculus I students
- are exposed to the notion of *limit* as it pertains to functions, derivatives, Riemann integrals, and sequences and series.

- are exposed to the pervasive use of calculus in other disciplines, with emphasis on applications in the physical sciences

- are introduced to problem solving using continuous functions to model phenomena

- develop skills in using computer software or calculators to solve problems in differential and integral calculus

Upon completion of the course we expect students to be conversant in the rudiments of elementary calculus. They should be able to do the following:
- analyze functions defined graphically, numerically, or by formula

- articulate the fundamental properties of the trigonometric, exponential, and logarithmic functions

- articulate the fundamental properties of continuous functions, such as the intermediate and extreme value theorem

- articulate the notions of limit, continuity, derivative, and antiderivative, and graphically interpret them

- evaluate limits, derivatives, and antiderivatives

- apply the derivative in optimization problems, linear approximation, and evaluation of indeterminate forms

- articulate the relationship between the Riemann integral and area

- articulate the Fundamental Theorem of Calculus

CORE EMBEDDED ELEMENT: Quantitative Literacy

The goal of the quantitative literacy embedded element is to assist students in acquiring the ability to use quantitative methods and perspectives to understand and solve problems in real-world contexts.

Quantitative Literacy Course Performance Objectives:
In quantitative literacy courses students will learn to do the following:

- Recognize the role of mathematics in society

- Model real-world problems

- Use quantitative methods to solve problems

- Estimate and verify quantitative solutions

- Interpret quantitative information

Quantitative Literacy Course Performance Indicators

- Recognize the role of mathematics in society: Students will demonstrate an understanding of various mathematical relationships and their applications in real-world problems

- Model real-world problems: Students will demonstrate the ability to read an application in context, determine relevant variables and constants, then describe the mathematical relations among the variables.

- Use quantitative methods to solve problems: Students will demonstrate the ability to use mathematical methods (algebraic, geometric, numerical, graphical, and/or statistical) supported by technology to solve problems.

- Estimate and verify quantitative solutions: Students will demonstrate the ability to estimate and check answers to mathematical problems in order to determine plausibility, identify alternatives, and select optimal results.

- Interpret quantitative information: Students will demonstrate the ability to interpret, evaluate, and draw inferences from solutions, graphs and data in terms of the language of the problem.

METHODS OF ASSESSMENT
Course performance objectives are assessed by traditional means: graded homework assignments, online homework using Webwork, weekly quizzes, written journals, 3 hourly examinations, and a cumulative final exam. The development of analytical and logical reasoning skills are inherent in the nature of mathematics and are assessed in conjunction with the course performance objectives. Computational technology use is required for successful completion of assignments and examinations.

Meeting the course objectives will be done through lectures and other activities introducing new material, question and answer sessions, homework assignments, quizzes, and exams.

Assessment Disclosure Statement: Student work products for this course may be used by the University for educational quality assurance purposes.

Attendance: You are expected to attend each class session. You are responsible for noting any information or changes announced in class. We will have class meetings on all scheduled class days. Do not make plans to leave at the end of the term before checking the final schedule. **You may not take the final at a time other than when it is scheduled by the university.**

A Note on Cell Phones: Cell phones should not be heard or seen in class. If you are in a situation that requires that you be reachable during class time, please talk to me ahead of time and we can make arrangements.

Homework: Homework is split into TWO categories, Written Homework and Webwork. All sections of MTH 201 and MTH 202 will have common Webwork assignments, separated by section in the text.

Written Homework will be assigned daily. I strongly suggest you do your homework regularly; it's best done following class, every day. The material will be fresh in your mind, and you will spend less time on each assignment. Written homework is due **two class-meetings** after the section is covered at the beginning of class; WebWork will be due at midnight on the day homework is due. **Failure to complete more than 70% of the homework assignments will result in automatic failure of the course.**

Homework will be graded both for completeness and correctness and, as with anything you turn in for a grade, should be written up neatly. Please adhere to the following guidelines for HW:

- The problems should be written in numerical order and work on individual problems well organized;

- Please invest in a **stapler**, individually or in a cohesive group, and use it to staple your pages in the upper left corner. Please staple the entire HW assignment together. Paper clips or the way you may have learned to 'cleverly' fold this corner are actually useless and annoying;

- Please remove the "fringe" on the side of any pages that you have torn from a notebook;

- At the top of the first page write your name, the HW assignment, and your section.

You should feel free to work with other students on the HW – in fact, I *encourage* you to talk to others if you find that you benefit from working collaboratively – just make sure that the work you turn in is your own. You, and you alone, are responsible for knowing and understanding the material in the course and will not be allowed to collaborate on exams.

No late assignments will be accepted, except those approved by the instructor due to an excused absence. Arithmetic and analytical work may be given partial credit when you have shown some aptitude. However, **no** credit will be given on problems for which an answer is given with insufficient work displaying the steps and reasoning needed for a solution. Where appropriate, answers must be written using complete sentences.

When you open a WW problem set for a section, you will get both the paper problems assigned for that section and the WW problems.

DUE DATES: As noted above, homework is due **two class-meetings** after the section is covered; WebWork will be due at midnight on the day homework is due.

BE WARNED: it is your responsibility to be aware of due dates for homework - I will not keep reminding you in class.

Quizzes/Class Activities: Short quizzes will be given weekly,usually on Thursdays (except the first Thursday and the days we have exams) and will be based on the homework due up to and including that day. Quizzes will be graded based on mastery. That means that either you get full credit for a quiz or you get zero points. Note that you can get full points even if you make a mistake, so long as you have shown 'mastery' of the particular topic. You can make up a zero point quiz after subsequent quizzes if you turn in quiz corrections at least 24 hours beforehand.

Exams: There will be three in-class exams and a final exam. For this course, exams will fall on Thursdays, and you will be allowed to use the full 85 minutes of class time in the TR schedule, though these exams will be designed to be completed in 55 minutes. Exam dates are listed below in the grading section, though these are **tentative** and subject to change. **No early examinations will be given, except as noted below.** as scheduled by the university. University policy requires that students take the final exam at the time determined by the registrar.

Policy on Make-up Exams: I do not give make-up exams. There are two, and only two, exceptions. These are an absence due to extreme hardship or a University sponsored event. In the latter case, you must inform me at least one week in advance, and within the first week of the semester if you must miss the final exam. You may be asked to take the exam early. In case of extreme hardship (e.g. illness or death of a family member), please notify me in advance if at all possible. I reserve the right to deny make-up work and penalize absences that are not verified (health practitioner's note, police report, etc).

Calculator use: Unless specifically noted you will NOT be allowed to use a calculator on quizzes and exams. If you have an accommodation plan from Accessible Education Services, and that plan includes a calculator accommodation, please inquire with AES for a copy of the Mathematics Department Calculator Accommodation Policy.

Academic Dishonesty: Academic dishonesty will not be tolerated. Although students may study in groups and may discuss assignments with each other, all work turned in must be done by each student, individually. Violators will be reported to the appropriate Dean.

Course grade based on:

Group-work and Participation	3%
Writing Homework	10%
WebWork	10%
Quizzes	10%
Exams (3, 14% each)	42%
Final Exam	25%

Grading Breakdown: % of total possible

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\begin{array}{rrcr}
A & 90 & - & 100\% \\
B & 80 & - & 89\% \\
C & 70 & - & 79\% \\
D & 60 & - & 69\% \\
F & 0 & - & 59\%
\end{array}
$$

A letter grade with $+$ or $-$ is assigned within the highest or lowest 2% of each range, respectively.

You must earn a grade of C- or higher to move on to subsequent courses.

Qualitative Description of Grading

A This grade indicates superior work that is clearly above average. To earn an A, a student must demonstrate a superior level of knowledge and an ability to use the same in unfamiliar situations. This student will have no difficultly using and extending this knowledge to most new situations nor in continuing to learn in this direction.

B This grade indicates good work that meets all requirements and is eminently satisfactory. This student will be able to use and extend this knowledge in many situations.

C This grade indicates competent work that demonstrates an acceptable level of knowledge relevant to the course. This student should be able to continue learning in this field of study.

D A grade of D indicates minimally acceptable work. This student is unlikely to be able to apply this knowledge at any level nor continue studies in this direction.

Withdrawal Proceedures: It is the student's responsibility to drop the course if he or she is no longer planning on attending the course or filling the other course requirements. In order to drop, the student must use and Add/Drop form available at the Advising Office. If a student does not properly withdraw from a course, he or she may receive an **F** for the course. A properly withdrawn student will receive a **W**. **The last day to withdraw is Monday, November 20th.**

Incompletes: An incomplete **(I)** may be given when the quality of a student's work is satisfactory (C or better), but for some essential reason the course has not been completed by the student. An (I) is reserved for emergency situations only. To request an incomplete, the student needs a typed, signed and dated letter stating the reason(s) why an incomplete is appropriate. The letter should also contain the conditions for the completion of work. Acceptance of the request shall be at the instructor's discretion. Formal approval is given to the instructor through application to the Dean's office.

Course Schedule: This schedule is **tentative** and we may go faster or slower at times; I may **modify** the lecture or exam schedule based on the needs and pace of the class. I may cancel or postpone review sessions in order to cover course material. You are expected to preview the topics to be covered in class. You should make every attempt to keep up with this fast paced class.

Homework Assignments: Each assignment is due two class meetings after we finish the section material in class.

Getting Help: My sincerest advice to you: **do *not* wait until the last minute to get help.** Mathematics is a cumulative subject and material builds on prior knowledge, particularly in this course. I have a number of office hours set during which you can stop by to get help on any problems. If you cannot make it to my office hours, make an appointment to see me for help. **I am here to help you, but you have to be willing to seek and accept help!** If you email me with a question (which is fine), please be specific about the problem, what you've tried, and where you're stuck. Also, keep in mind that I may check my email less frequently than you would like, and rarely return email late at night. *Coming to visit my office is the most effective and efficient way to get help.*

University Policies & Resources

University of Portland's Code of Academic Integrity
Academic integrity is openness and honesty in all scholarly endeavors. The University of Portland is a scholarly community dedicated to the discovery, investigation, and dissemination of truth, and to the development of the whole person. Membership in this community is a privilege, requiring each person to practice academic integrity at its highest level, while expecting and promoting the same in others. Breaches of academic integrity will not be tolerated and will be addressed by the community with all due gravity.

Assessment Disclosure Statement
Student work products for this course may be used by the University for educational quality assurance purposes.

Accessibility Statement
The University of Portland endeavors to make its courses and services fully accessible to all students. Students are encouraged to discuss with their instructors what might be most helpful in enabling them to meet the learning goals of the course. Students who experience a disability are also encouraged to use the services of the Office for Accessible Education Services (AES), located in the Shepard Academic Resource Center (503-943-8985). If you have an AES Accommodation Plan, you should make an appointment to meet with your faculty member to discuss how to implement your plan in this class. Requests for alternate location for exams and/or extended exam time should, where possible, be made two weeks in advance of an exam, and must be made at least one week in advance of an exam. Also, you should meet with your faculty member to discuss emergency medical information or how best to ensure your safe evacuation from the building in case of fire or other emergency.

Mental Health Statement
As a college student, you may sometimes experience problems with your mental health that interfere with academic experiences and negatively impact daily life. If you or someone you know experiences mental health challenges at UP, please contact the University of Portland Health and Counseling Center in Orrico Hall (down the hill from Franz Hall and Mehling Hall) at http://www.up.edu/healthcenter/ or at 503-943-7134. Their services are free and confidential, and if necessary they can provide same day appointments. In addition, they make after-hours phone counseling available if you call 503-943-7134 and press 3 outside of business hours. Also know that the University of Portland Public Safety Department (503-943-4444) has personnel trained to respond sensitively to mental health emergencies at all hours. Remember that getting help is a smart and courageous thing to do for yourself, for those you care about, and for those who care about you.

Non-Violence Statement
The University of Portland is committed to fostering a community free from all forms of violence in which all members feel safe and respected. Violence of any kind, and in particular acts of power-based personal violence, are inconsistent with our mission. Together, we take a stand against violence. Join us in learning more about campus and community resources, UP?s prevention strategy, and reporting options on the Green Dot website, www.up.edu/greendot or the Title IX website, www.up.edu/titleix.

Ethics of Information
The University of Portland is a community dedicated to the investigation and discovery of processes for thinking ethically and encouraging the development of ethical reasoning in the formation of the whole person. Using information ethically, as an element in open and honest scholarly endeavors, involves moral reasoning to determine the right way to access, create, distribute, and employ information including: considerations of intellectual property rights, fair use, information bias, censorship, and privacy. More information can be found in the Clark Library?s guide to the Ethical Use of Information at libguides.up.edu/ethicaluse.

The Learning Commons
The Learning Commons, located in Buckley Center 163, offers a variety of peer tutoring programs that facilitate your active learning and mastery of skills and knowledge. For questions about the Learning Commons, please send all correspondence to Jeffrey White, Administrator, at white@up.edu. The Learning Commons is a program of the Shepard Academic Resource Center.

Math Resource Center
Math Resource Center: Appointment-based tutoring is available through our online scheduler at www.bit.ly/up_mrc. Walk-in tutoring Sundays through Thursdays evenings. For MTH 141, request appointments at . The course-specific schedule can be found at www.up.edu/learningcommons, or the reception desk in BC 163.

Writing Assistance
Brainstorming ideas for your paper, create an outline, work on citations, or review a draft with a Writing Assistant. Visit `www.up.edu/learningcommons` to access our Writing Center schedule.

The Language Studio
Contact the language assistance hotlines to schedule a time to meet throughout the semester at chinesetutor@up.edu, frenchtutor@up.edu, germantutor@up.edu, or spanishtutor@up.edu.

Natural Sciences Center
Send your tutoring requests to biotutor@up.edu, chemtutor@up.edu, or physicstutor@up.edu.

Speech & Presentation Lab
Improve your presentations by requesting an appointment at speech@up.edu.

Group Work Lab
Make an appointment for your group project at groupwork@up.edu.

Nursing Tutoring
Tutoring is available for pathophysiology, BIO205, anatomy and physiology, and other nursing courses on a walk-in or appointment basis. Up-to-date schedule information is at `www.up.edu/learningcommons/nursing`.

Economics and Business Tutoring
For support in economics, OTM, finance, accounting, and business law courses, send requests for appointments to your discipline's respective tutor email hotline: econtutor@up.edu, otmtutor@up.edu, financetutor@up.edu, accountingtutor@up.edu, or bizlaw@up.edu.

Shiley Sophomore Fellows
Provides tutoring in several sophomore engineering classes. To make an appointment, send a request to .

Learning Assistance Counselor
Learning assistance counseling is also available in BC 163. The counselor teaches learning strategies and skills that enable students to become more successful in their studies and future professions. The counselor provides strategies to assist students with reading and comprehension, note-taking and study, time management, test-taking, and learning and remembering. Appointments can be made in the on-line scheduler available to all students in Moodle or during posted drop-in hours.

Requirements for University Core Course Syllabi
In addition to discipline-specific goals and objectives, syllabi for all core courses are to contain clear statements of the

- Core question(s) to be addressed in the class;

- Intended core goals(s);

- Core skill(s), including performance objectives and means of assessment.

Voluntary Syllabus Statement

Academic Regulation Statement: Policies governing your coursework at the University of Portland can be found in the University Bulletin at www1.up.edu/registrar.