



GOSHEN COLLEGE
MATHEMATICS DEPARTMENT
MATH 211 CALCULUS I - FALL 2023-24

Motivation	Calculus is the mathematical study of change. How does a quantity change with respect to other quantities? What is the rate of change? What is the total, accumulated, change? These questions arise in physics, chemistry, biology, ecology, psychology, economics, and other disciplines. Calculus was one of the greatest intellectual triumphs of the 17 th and 18 th centuries, and its concepts and techniques remain applicable today.
Catalog Description	Concepts of calculus emphasizing applications in the natural and social sciences. Topics include differential calculus of one and several variables, integration, mathematical modeling using differential equations. Prerequisites: three and one-half units of high school mathematics including trigonometry or Math 170. Earns 4 credit hours.
Learning Objectives	The student will <ol style="list-style-type: none">1. Describe and manipulate polynomial, trigonometric, exponential, logarithmic, piecewise, combined, composed, and multivariate functions;2. Interrelate and use symbolic, graphical, numeric, and verbal representations of functions, differentiation, antidifferentiation, integration, and separable differentiable equations to solve pure and applied problems;3. Use technology to investigate, visualize, and solve calculus problems;4. Learn mathematics by reading, listening, exploring, and conversing in an effective manner;5. Explain mathematical reasoning through writing in a precise and articulate manner in both informal and formal settings; and6. Exhibit curiosity, playfulness, creativity, confidence, perseverance, interest in multiple perspectives, and a collaborative spirit.
Recommended Background	A C or better grade in Math 170 Functions, Data, and Models or grades of A or B in 4 years of high-school mathematics that includes algebra, geometry, trigonometry, and precalculus. A score of 76% or above on the ALEKS Placement Exam (and enter the class code 4CFL6-DDUVJ) is highly recommended. The exam can be taken multiple times, and modules are available to help you review any gaps in your knowledge. Precalculus material will be reviewed rapidly during the first two weeks. If you have any concerns about your readiness for this course, please converse with the instructor.
Instructor	David Housman, SC 117, dhousman@goshen.edu, 535-7405 Hours when he is available in his office are posted on his office door and on Moodle.
Class Time	MWF 12:00-12:50 p.m. in SC 107. R 9:30am – 10:45am or 11:00am – 12:15pm in GL 102.
Textbook	<i>Applied Calculus</i> , by Deborah Hughes-Hallett <i>et al.</i> , 4th Edition is the required resource. A pdf version is in Moodle and two print copies are on the Good Library reserve shelf.
On-line	Moodle contains all course information. Announcements posted to the forum will be emailed to all students. CoCalc , Desmos , and Geogebra will be used for computation and most lab assignments.
Notebook	A three-ring binder with loose-leaf lined and graph paper is recommended so that you can keep a written record of problem-solving attempts, questions, math discoveries, and skill assessments.
Activities	The study of mathematics is not a spectator sport! Reading, listening, solving problems, writing explanations, reflecting upon ideas, and receiving feedback are essential to learning mathematics. Read with paper and pencil in hand, and take an anticipatory approach: try to obtain solutions, explanations, and proofs before reading what the author provides. Write down specific questions when you do not understand a portion of the text or a lecture.

Moodle will announce the text section(s) to be covered during a class and homework to be completed before the next class. Read at least some of the sections to be covered before class. Class will complement and supplement your preparatory reading. Homework will deepen your understanding. First attempt homework problems as if they were a closed book exam with a goal of being at least 90% correct. You are then encouraged to compare your work with the answers provided in CoCalc and to collaborate and seek assistance when having difficulties. You will have achieved the expected level of understanding when you are able to obtain your own solutions, independently reproduce solutions developed in collaboration or with assistance, and/or explain a solution to others.

An average student (B grades in four years of high school algebra, geometry, and precalculus) can obtain an average grade (B- has historically been the median grade in this course) with an average of twelve hours each week devoted to this course (this includes class time)—adjust if you are not average or desire a grade that is not average.

Grading

Course grades will be based on performance on quizzes and surveys (15%), labs (25%), three midterm exams (15% each for a total of 45%), and a comprehensive final exam (15%). The quizzes and surveys grade and any midterm exam grade that is lower than the final exam grade will be replaced with the final exam grade. The course grade will be translated into letter grades in the following manner.

Minimum Percentage	93	90	87	83	80	77	73	70	67	60	0
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F

Quizzes

Check your growing understanding of the material with these take-home exercises. They will be distributed at the end of one class and returned by the start of the next class (drop off in SC 117 before the deadline if unable to come to class). You are encouraged to first treat the quiz as a closed-book exam; however, you may use any inanimate class resource (e.g., the text, your notes, Moodle, and CoCalc) to complete and check your work. You may not obtain assistance from any person.

Surveys

Assess your relationship with this course. Points are earned for completion.

Exams

Exhibit your ability to solve problems and describe mathematical concepts independently.

Labs

Apply the concepts and techniques of calculus to more substantial problems. Develop and refine written communication skills through reports. You are encouraged to complete these in groups. You will typically start the lab assignment during your lab period on Thursday and your submission will be due the following Wednesday. Optionally, a second or late submission may be submitted by the following Wednesday, and the posted score will be $(0.3) * (\text{original score}) + (0.7) * (\text{second or late score})$.

Activities

Extra Credit

Receive extra credit toward your quizzes and surveys grade by doing one or more of the following: (1) find errors in the text or posted course materials and describe the error in writing; (2) attend a quantitative presentation (e.g., [Science Speakers](#)) or participate in a quantitatively based activity and describe in writing some interesting mathematical aspect of the presentation or activity; or (3) participate in a [Career Services](#) event and describe your most important discovery. The description should be a substantive paragraph or two and be submitted to the instructor on paper. Up to 5 points will be earned for each report and a maximum of 50 points can be earned in total.

Tentative Schedule

Topic	Sections	Exam Date
Functions	1.1-3 & 5-10, 9.1-2	Mon Sep 18
Intro to Derivatives and Integrals	2.1-4 & FT, 3.1-5 & FT, 5.1-4	Mon Oct 23
Derivatives, Integrals, & Applications	4.1-3, 5.5 & FT, 7.1-3 & 5, 9.3-6	Mon Nov 20
Differential Equations	10.1-4 & FT	
Everything	All of the above	Fri Dec 8, 3:30-5:30pm

Study Sessions, Extra Credit, and Tutoring	A Student Teaching Assistant (STA) will run study sessions at scheduled times. This is a good time to study and collaborate with other students with the STA available to answer questions and provide guidance. The schedule will be announced shortly after the beginning of the semester. You will receive 5 extra credit points towards your quizzes and surveys grade for each study session attended up to a maximum of 50 points. The Academic Success Center provides individual tutoring by appointment at tutorcal.goshen.edu .
Accessibility Accommodations	Goshen College is committed to providing all students equitable access to programs and facilities. Students who need accommodations based on disability should contact the Academic Success Center (ASC). Students must register with the ASC before faculty are required to provide reasonable accommodations. For more information or to register, please contact the Director of Academic Success, Michelle Blank, Good Library 112, mblank@goshen.edu or 574-535-7526. To ensure that learning needs are met, contact the ASC the first week of classes. More information at: https://www.goshen.edu/campuslife/asc/disability-services/ .
Collaboration and Academic Integrity	<p>You are encouraged to use all available resources in order to learn the concepts and techniques discussed in this course. In particular, conversations with other students and the instructor can be an effective learning method. Reading other books and web pages can be another effective learning method. However, copying someone else's work subverts the learning process.</p> <p>For labs, you may look at and discuss another student's work, but any written work developed during collaboration with another student should be destroyed before writing your own solutions. You should give written acknowledgement to people with whom you have had discussions and to any written materials (other than the text) that were helpful.</p> <p>For quizzes and exams, you may <i>not</i> use any resources unless a specific exception is stated.</p> <p>Failure to observe the above rules will result in a zero on the assignment or exam. Any violation of academic integrity will be reported to the Academic Dean.</p> <p>Observation of the above rules will help you learn the material well and give you the satisfaction of knowing that you have earned your grade.</p>
Due Date Policy	Class participation, assignments, projects, and exams can only be excused, rescheduled, or made up if (1) there is a serious medical problem, a death in the immediate family, or an irreconcilable conflict with another official Goshen College activity; (2) there is written documentation signed by proper authorities; and (3) the instructor is notified prior to the due date or as soon as possible afterwards.
Course Materials are for Private Use	Course materials (videos, assignments, exams, problem sets, etc) are for use in this course only. You may not upload them to external sites, share with any person outside this course, or post for public commentary without written permission from the professor. Sharing recordings outside of the class could lead to a copyright or FERPA violation. Goshen College prohibits any student from duplicating, downloading, or distributing class recordings with anyone outside of this class, for any reason.
Student Life Resources	<p>Goshen College is committed to providing a safe, supportive, and equitable learning environment. If you encounter circumstances that impact your learning or personal safety, please contact someone from Student Services (studentservices@goshen.edu or 574.535.7474).</p> <ul style="list-style-type: none"> • Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Dean of Students Gilberto Pérez Jr. (gperez@goshen.edu or 574.535.7434) for support. • Adriana Ortiz, Director of Hispanic Student Recruitment and Family Engagement, is available to help commuter students (aortiz@goshen.edu or 574.535.7291). • Resident Directors Kevin Schultz (kevints@goshen.edu or 574.535.7286) and Jordan Blank (jblank@goshen.edu or 574.535.7296) are available to assist residential students. • If you experience safety issues on campus, please contact Chad Coleman, Director of Campus Safety (chadc@goshen.edu or 574.535.7292).

Goshen College does not condone and will not tolerate inappropriate conduct toward any individual based on the individual's sex, sexual orientation, national origin, race, ethnicity, documentation status or gender identity. Issues related to [gender](#) and [racial](#) discrimination or harassment can be reported online. You may also contact Dean of Students Gilberto Pérez Jr. (gperez@goshen.edu or 574.535.7434) or Deputy Title IX Coordinator Liz Andes (landes@goshen.edu or 574.535.7484).