

Math 171 – Calculus 1 – Fall 2024 – Sections 1 and 3

Section 1

8:30am-9:45am MWF
Birdsong Hall 101

Section 3

11:30am-12:45pm MWF
Birdsong Hall 101

Instructor

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Office: Eggleston 110
Office hours: 10-12 Tue/Th

What is this course? This course is about functions and the shapes of their graphs. You will need to become comfortable with recognizing, sketching, and reasoning about graphs of functions of various types: linear, polynomial, rational, trigonometric, radical, exponential, etc. The course is roughly broken into four quarters corresponding to four exams.

1. Tangent lines, rates of change, and the derivative of a function.
2. Calculating derivatives by breaking functions down into smaller components.
3. Applications of derivatives such as finding max/min values and optimization.
4. Anti-differentiation and its uses for calculating areas.

Required supplies

- *University Calculus: Early Transcendentals (4th Edition)* by Hass et al (ISBN 978-0-13-516484-6). The textbook is the source of problem sets and a useful resource for you when struggling. It is possible to accomplish this with an electronic copy.
- Binder/notebook for keeping handouts, taking notes, and working on homework problems.

Course objectives: By the end of the semester, a successful student will be able to

- Quickly sketch common functions (linear, quadratic, radical, exponential, logarithm) in the xy -plane and use geometric intuition as a problem-solving tool.
- Use differentiation techniques like the power rule and chain rule to compute derivatives.
- Use anti-differentiation techniques like the power rule and u -substitution to calculate anti-derivatives and evaluate definite integrals.

Problem sets: Problems from the book will regularly be assigned, but they will not be graded. Working through problems is essential to your success on exams and in the course overall.

Grades: Final grades will be computed as a weighted average of four categories.

		[93, 100]	A
		[90, 93)	A-
		[87, 90)	B+
		[83, 87)	B
		[80, 83)	B-
Attendance/participation	10%	[77, 80)	C+
Sketch notebook	8%	[73, 77)	C
Tests (4 tests, 18% each)	72%	[70, 73)	C-
Final exam	10%	[67, 70)	D+
		[63, 67)	D
		[60, 63)	D-
		[0, 60)	F

Attendance/participation: Attendance will be taken every day. Missing class for any reason is an absence, regardless of circumstances. ~~Six or more absences will lead to automatically failing the course.~~

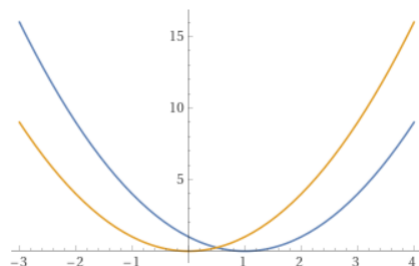
Participation includes working on problems during class. Non-participation will be counted as an absence for that day. Being late, leaving the classroom for an extended period, or otherwise being virtually absent (i.e. using a phone, laptop in a way not relevant to class) will count as an absence. Participation also includes the in-class projects towards the end of the semester.

Sketch notebook: Each class will begin with a “Sketch of the day.” Think of this as the math version of a chemistry lab notebook. I will provide you a notebook. Notebooks will be collected at the halfway point (October 16) and on the last day of class.

Example sketch notebook entry

Date: Wednesday, August 28

Graph $y = x^2$ and $y = (x - 1)^2$ on the same plot



Tests: We will have four exams on September 16, October 11, November 1, and December 4, each worth 18% of the overall grade. If your final exam score exceeds your lowest test score, the final exam grade will replace that test score. If you must miss a test, let me know as soon as possible. Valid reasons to make up a test include sickness and college-related obligations that cannot be rescheduled.

Final exam: The final exam will be comprehensive, covering everything from the semester. For the 8:30am section, the final exam is at 8am on Friday, December 13. For the 11:30am section, the final exam is at 11:30am on Saturday, December 14. If you would prefer to take the final exam with the other section, we can discuss this possibility as long as you notify me by Friday, December 6th.

Disability services: Virginia Wesleyan University is committed to giving all students the opportunity of academic success. If you are a student who is requesting accommodations based on the academic impact of a disability, speak to me about your accommodations letter and your specific needs. If you do not have an accommodation letter for this course, you will need to visit or call for an appointment with the Executive Director of Academic Support Services, Crit Muniz at (757) 233-8898 or by email at disabilityservices@vwu.edu to coordinate reasonable accommodations. His office is in Clarke 204.

Key dates

September 16	Exam 1
October 11	Exam 2
October 14	No class, Fall break
October 16	Sketch notebooks collected for progress check
November 1	Exam 3
November 27, 29	No class, Thanksgiving break
December 4	Exam 4
December 9	Last day of class, sketch notebooks due
December 13/14	Final exam

Detailed schedule

Day	Section	Topic
Week 1		
August 28	2.1	Welcome to calculus, review some precalculus
August 30	2.1, 3.1	Rates of change and tangent lines
Week 2		
September 2	3.2	The derivative as a function, via limit methods
September 4	3.2	The derivative as a function, via graphical methods
September 6	3.3	Calculating derivatives, the binomial theorem, and the power rule
Week 3		
September 9	3.3	More power rule, negative and fractional exponents
September 11	3.3	Derivatives of exponential functions
September 13		Review for Exam 1
Week 4		
September 16		Exam 1
September 18	3.3	Sum, product, and quotient rules for derivatives
September 20	3.3	Higher derivatives
Week 5		
September 23	3.5	Derivatives of trigonometric functions
September 25	3.6	The chain rule
September 27	3.6	The chain rule
Week 6		
September 30	3.7	Implicit differentiation
October 2	3.8	Derivatives of inverse functions
October 4	3.9	Derivatives of inverse trigonometric functions
Week 7		
October 7	3.11	Linearization, linear approximation, and differentials
October 9		Review for Exam 2
October 11		Exam 2

Week 8		
October 14		No class, fall break
October 16	4.1, 4.2	Maxima and minima, the mean value theorem
		Sketch notebooks collected for halfway check
October 18	4.3	The first derivative test
Week 9		
October 21	4.4	Curve sketching
October 23	4.4	Curve sketching
October 25	4.6	Optimization
Week 10		
October 28	4.6	Optimization
October 30		Review for Exam 3
November 1		Exam 3
Week 11		
November 4	5.1, 5.3	Integrals and area
November 6	5.4	The fundamental theorem of calculus, part 1
November 8	5.4	The fundamental theorem of calculus, part 2
Week 12		
November 11	4.8	Antiderivatives
November 13	5.5	u -substitution for antiderivatives
November 15	5.6	u -substitution for integrals
Week 13		
November 18	5.6	u -substitution practice
November 20	7.2	Exponential modelling and separable differential equations
November 22	7.2	Exponential modelling and separable differential equations
Week 14		
November 25	7.2	Exponential modelling and separable differential equations
November 27		No class, Thanksgiving break
November 29		No class, Thanksgiving break
Week 15		
December 2		Review for Exam 4
December 4		Exam 4
December 6		In-class projects
Week 16		
December 9		In-class projects
Exam week		
December 13		8am-10:30am Final exam (8:30am section)
December 14		11:30am-2pm Final exam (11:30am section)