Villanova University Fall 2021

MATH 1500 – Calculus I

SYLLABUS

The syllabus on Blackboard shows course meeting times and the final exam dates for your section.

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Email: melissa.fuentes@villanova.edu (will respond to emails 8 AM-6 PM, Monday to Saturday)
Office hours: M W 1-2 PM, Th 2-3 PM. All others by appointment at a mutually convenient time, in person, or virtually via Zoom.
Course Website: https://www.MelissaMFuentes.com/mat1500

Course Description: This 4-credit course begins with an introduction to functions, including linear, power, and trigonometric functions. Students then delve into exponential functions, logarithms, and their applications. Extending the function concept leads naturally into an exploration of continuity, limits, differentiation, indeterminate forms, and optimization. The course concludes with a discussion of Riemann sums, basic integration, and the Fundamental Theorem of Calculus. To complement classroom instruction, students will be required to problem solve using the computer algebra system, Maple.

Prerequisites: To be successful in this course, a student should have a strong background in algebra and some familiarity with trigonometry. Ordinarily this means high school trigonometry and advanced algebra.

Course Objectives: After successfully completing this course students should be able to:

- Identify functions in multiple forms such as verbal descriptions, tables, algebraic equations, and graphs.
- Identify and make connections among functions, families of functions, and inverses.
- Understand the concepts and connections among continuity, limits, derivatives, and summation.
- Understand derivatives as a rate of change.
- Determine tangent lines and calculate tangent line approximations.
- Combine knowledge of functions and differentiation techniques to obtain solutions for optimization and other application driven models.
- Understand the spatial relationships among function graphs and their corresponding derivatives.
- Connect the ideas of area and distance to integration.
- Understand and apply the Fundamental Theorem of Calculus.

Course Textbook: *Calculus: Early Transcendentals, 9th ed.* by J. Stewart, D. Clegg, and S. Watson. An e-textbook is included with WebAssign access, which is required for the course (see below).

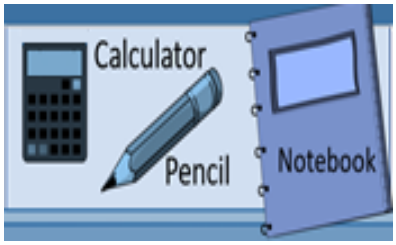
Required Materials:
WebAssign: This course will require students to complete weekly online homework assignments. This will be handled by WebAssign, an online supplement to our textbook. Purchase options (single or multi-semester) and WebAssign registration instructions can be found at www.cengage.com/coursepages/Villanova_Calc_Blackboard.

Blackboard: https://elearning.villanova.edu/
All class materials will be posted to Blackboard. You are expected to check Blackboard regularly to read announcements, download worksheets, find updates to the schedule, and find due dates. Access to WebAssign, course materials, and due dates can be found under "Course Content."

Maple: This course will include Maple assignments in and outside of class. Maple (2020 version) is available for all students for download. It will work on a PC or a MAC. You can download it at **http://www1.villanova.edu/villanova/unit/portal.html .**

Suggested Materials:

Calculator: You may use a scientific calculator during class, exams, quizzes, and to complete assignments. *Graphing calculators are prohibited.* **The most advanced calculator that can be used during exams should align with the TI-30X family (VU Bookstore: www.bkstr.com/villanovastore/product/calc-ti30xiis-duel-pwr-blue-144483-1).** *More advanced calculators and use of a cell phone or tablet app is prohibited during quizzes and exams.*



Homework: There will be weekly homework assignments (2-3 sets in total), **due each Wednesday by 11:59 PM.** Check each week's module section on Blackboard for the homework assignments that are due. There will not be weekly announcements for homework due dates.

You are encouraged to study with and discuss problems with others from the class, but write up your own homework by yourself, and make sure you understand how to do the problems. **If you require an extension for a WebAssign assignment, 5 points will be deducted for each additional day it is late.**

There will be two Maple assignments to be completed outside of class. You may choose to submit it individually or with your classwork group members. The due dates will be announced later in the semester.

Classwork: A worksheet will be posted every week on Blackboard and the course website. Fridays will be dedicated to group work. Each of you will be a member of a group of 5-6 students and will submit one completed worksheet per group every week.

Quizzes: There will be a group quiz every week (except midterm exam weeks). That is, quizzes will be completed with your classwork group members. Each quiz will cover the previous week's material. Quiz problems will be selected from WebAssign assignments, worksheets, or practice problems (similar to homework and examples done in class). **The two lowest quiz grades are dropped.**

Exams: There will be two in-class midterms and a final exam. The tentative dates are listed below.

Midterm 1: Monday, September 27th
Midterm 2: Monday, November 1st
Final (cumulative): Please check syllabus on Blackboard.

Extra Credit: There will be no extra credit assignments given in this course.

Grading Policy: Grades will be computed according to the following point system:

Homework: 150 points
Quizzes: 150 points
Maple Assignments (2 total): 2 x 60 = 120 points
Classwork: 120 points
Midterm 1: 150 points
Midterm 2: 150 points
Final Exam: 160 points

1000 points in total possible

Letter grades:

Points	920-1000	880-919	840-879	800-839	770-799	740-769	700-739	670-699	640-669	600-639	570-599	0-569
Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

Course Policies

Cell phones should be turned off/muted during class. No texting.

Unless time has been allocated for in-class computer use, use of a PC or MAC is discouraged. Tablet/Ipad usage is allowed.

Recording class lecture, either audio or video, is strictly prohibited without the express written consent of the professor. Violation of this policy will result in a failing grade for the course.

Attendance: It is expected that students will attend every class. The official **freshman rules** for attendance apply. **Missing more than a third of all classes results in a failing grade**. The university attendance policy on attendance also addresses what may constitute an excused absence:
https://www1.villanova.edu/villanova/provost/resources/student/policies/attendance.html

Make-ups: Late work will **not be accepted**. If you or your group need additional time for an assignment, please speak to me in **advance** of the due date. **Extensions for work will not be granted after an assignment is due. Make-ups will not be given for unexcused missed classwork assignments.**

There are **no make-ups** for exams or quizzes without **written documentation**. All requests for make-ups and extensions must be officially requested by email. If a make-up exam or quiz is warranted, then it must be made up **within two class dates** after you return to campus. For example, if you were to miss an exam on Monday, the makeup exam must be completed by Thursday of that same week.

Travel plans do not constitute an acceptable reason to reschedule an exam or quiz. Please plan accordingly during finals and semester breaks.

Athletes: Students who participate in athletics are excused from class **ONLY FOR GAMES**. **Athletes should provide me with a list of game dates along with a letter from their coaches by the end of the second week of the semester.** It is the responsibility of the athlete to make sure that all outstanding work due is turned in BEFORE the class is missed.

Changes to the syllabus: Any changes to the syllabus will be provided in writing and posted to Blackboard.

Office of Disabilities (ODS) and Learning Support Services (LSS): It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with disabilities. Go to the Learning Support Services website http://learningsupportservices.villanova.edu for registration guidelines and instructions. For physical access or temporarily disabling conditions, please contact the Office of Disability Services at 610-519-3209 or 610-519-4095, or email ods@villanova.edu. Registration is needed in order to receive accommodations.

Academic Integrity: All students are expected to uphold Villanova's Academic Integrity Policy and Code. Any incident of academic dishonesty will be reported to the Dean of the College of Liberal Arts and Sciences for disciplinary action. For the College's statement on Academic Integrity, you should consult the *Student Guide to Policies and Procedures*. You may view the University's Academic Integrity Policy and Code, as well as other useful information related to writing papers, at the Academic Integrity Gateway web site: https://library.villanova.edu/research/subject-guides/academicintegrity

Absences for Religious Holidays: Villanova University makes every reasonable effort to allow members of the community to observe their religious holidays, consistent with the University's obligations, responsibilities, and policies. Students who expect to miss a class or assignment due to the observance of a religious holiday should discuss the matter with their professors as soon as possible, normally at least two weeks in advance. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the absence.
https://www1.villanova.edu/villanova/provost/resources/student/policies/religious holidays.html

Schedule of Topics

The following is a tentative schedule of topics.

Week of	Topics
8/23	Syllabus and Introduction 1.1: Four Ways to Represent a Function 1.2: Mathematical Models: A Catalog of Essential Functions 1.3: New Functions from Old Functions
8/30	1.4: Exponential Functions 1.5: Inverse Functions and Logarithms 2.1: The Tangent and Velocity Problem
9/6	2.2: The Limit of a Function 2.3: Calculating Limits Using Limit Laws 2.5: Continuity
9/13	2.6: Limits at Infinity; Horizontal Asymptotes 2.7: Derivatives and Rates of Change 2.8: The Derivative as a Function
9/20	3.1: Derivatives of Polynomials and Exponential Functions 3.2: The Product and Quotient Rules 3.3: Derivatives of Trigonometric Functions
9/27	MIDTERM 1 (Monday, September 27) 3.4: The Chain Rule 3.5: Implicit Differentiation
10/4	3.6: Derivatives of Logarithmic and Inverse Trigonometric Functions 3.7: Rates of Change in the Natural and Social Sciences 3.8: Exponential Growth and Decay
10/11	SEMESTER RECESS
10/18	3.9: Related Rates 3.10: Linear Approximations and Differentials
10/25	4.1: Maximum and Minimum Values 4.2: Mean Value Theorem 4.3: What Derivatives Tell Us about the Shape of a Graph
11/1	MIDTERM 2 4.4: Indeterminate Forms and l'Hospital's Rule 4.5: Summary of Curve Sketching

11/8	4.7: Optimization Problems 4.8: Newton's Method
11/15	4.9: Antiderivatives 5.1: The Area and Distance Problems
11/22	5.2: The Definite Integral (PART 1) THANKSGIVING RECESS
11/29	5.2: The Definite Integral (PART 2) 5.3: The Fundamental Theorem of Calculus
12/6	FINAL EXAM REVIEW Thursday, December 9th is the last day of class.

Important Dates

Sunday, August 29 – Last day to add/drop courses.

Monday, September 6 – Labor Day (no classes).

Monday, October 11 to Sunday, October 17 – Semester Recess (no classes).

Wednesday, October 20 – Mid-semester grades due.

Wednesday, November 10 – Last day for authorized course withdrawal without academic penalty.

Tuesday, November 23 to Sunday, November 28 – Thanksgiving Recess (no classes).

Thursday, December 9 – Fall classes end.

Friday, December 10 – Reading day.

Saturday, December 11 – Friday, December 17 (excluding Sunday, Dec. 12) – Final exams.