Math 113–008: Calculus I

Fall 2019: TR 4:30pm – 6:20pm, Nguyen Eng. Bldg. 1101

Instructor: Dr. Daniel Anderson

(Room: 4411 Exploratory Hall, Tel: (703) 993-1482, Email: danders1@gmu.edu)

Office Hours: TR 3:00–4:00pm, and by appointment.

Text: *Thomas Calculus: Early Transcendentals*, Fourteenth Edition, by Hass, Heil, & Weir

Prerequisites: Sufficient recall of algebra and trigonometry is required. Successful completion of Math Placement Test or a grade of C or better in MATH 105.

Course Goals: To understand and be able to make use of the concepts of limits, derivatives and integrals of functions (e.g. polynomial, rational, exponential, logarithmic, trigonometric) and to understand the relationships between limits, derivatives and integrals.

Mason Core: This course satisfies the requirements of the Mason Core Quantitative Reasoning Category. The associated learning outcomes are for the students to be able to (1) interpret quantitative information and draw inferences from this information, (2) formulate quantitative problems and solve them using appropriate methods, (3) evaluate logical arguments, and (4) communicate and present quantitative results effectively.

Online class information, including assigned homework, will be posted periodically at
`http://math.gmu.edu/~dmanders/WEBDAN/math113fall19.html`

Exams: There will be two midterm exams. Midterm exam dates and topics listed below are tentative and will be confirmed in class. You are responsible for being aware of any such changes announced in class. *Makeup exams will not be given.* In the event that one exam is missed and (1) a valid, documented excuse is given in writing to the instructor at the time of the absence and (2) the student provides sufficient evidence to the instructor that he/she is keeping up with the topics in the course, the final exam score will count in place of the missed exam. The instructor will determine whether an excuse is valid. Without a valid documented excuse given at the time of the exam, a missed exam will count as a zero. If more than one midterm exam is missed, that situation will be dealt with on an individual basis.

Ungraded Homework: Problem sets from the sections in the textbook will be assigned regularly. Although these will not be collected, success in this class depends strongly on completing and understanding these problems. Working together on ungraded homework is encouraged but each student is ultimately responsible for understanding the material.

Graded Homework: There will be two graded assignments that will require the use of the mathematical software package Mathematica. Mathematica can be obtained by Mason students using the following link: `https://cos.gmu.edu/mathematica/` Further instructions will follow.

Recitation: There is a recitation section with this course led by a graduate teaching assistant and two learning assistants, offered at two different times each week. Quizzes may be given periodically during the recitation. Your participation in these recitations will count as part of your grade. Each recitation will be worth 10 points. For example, if there is no quiz given in recitation, you will receive 10 points for your presence and participation. If there is a quiz given during recitation your recitation/quiz score for that week will correspond to your graded quiz score. If you do not attend the recitation (quiz or no quiz), you will receive zero points for that recitation.

Grading Policy: Homework (Mathematica Assignments) = 10%
Quizzes and Recitation Participation = 15%
Midterm Exam Average = 50%
Final Exam = 25%

Note: Your Midterm Exam Average will be calculated as the average of your best two grades of the two midterm exams and the final exam with the following exception: If you have an unexcused midterm exam, that exam score (or possibly scores if you have two unexcused midterm exams) will be used in the calculation of your Midterm Exam Average. Here are some examples: If your midterm exam scores were 70 and 80 and your final exam score was 90 then your Midterm Exam Average will be (80+90)/2 = 85. If your midterm exam scores were 88 and 92 and your final exam was 70, then your Midterm Exam Average will be 90. If you had an unexcused midterm exam 1 and had 100 on midterm 2 and 100 on your final exam, your Midterm Exam Average will be 50.

In general, 90%–100% = A, 80%–89% = B, 70%–79% = C, 60%–69% = D, below 60% = F. Plus and minus grades will be approximately 2 or 3 percentage points above or below these boundaries (e.g. 88% would correspond to a B+). I reserve the right to lower the curve, but will not raise the curve.

Important Dates: Fall Break, October 14 (Monday classes meet Tuesday,
Tuesday classes do not meet this week)
Thanksgiving Recess, November 27 – December 1
Thursday, December 5 (our last day of classes)
(**Final Exam Date- NOT YET CONFIRMED - STAY TUNED!!!**)

Final Exam: The final exam will be an in-class cumulative exam and must be taken at the scheduled time. Exceptions are allowed only with a Dean's permission, by University rules.

MyMathLab: Students may choose to make use of online software associated with the textbook. Access to this software is at an additional cost above the textbook cost and so is not required. However, those that do purchase this will have access to online practice problems. The course ID is **anderson97736**. See blackboard for further instructions.

Calculators/Phones/Etc.: Calculators will be treated as devices to assist in *learning and*

understanding calculus but not as a replacement for *knowing and remembering* calculus and basic arithmetic. No calculators will be allowed for use on either quizzes or exams. The term 'calculators' here refers to any device such as standard scientific and graphing calculators but also smartphones, ipads, laptops, etc. No such devices will be allowed on your table/desk while taking quizzes and exams. Plan to turn off and put away all mobile electronic devices during quizzes and exams – accessing these devices between the time you receive your exam and the time you turn in your exam constitutes an honor code violation.

Other Notes: 1. Doing the assigned homework (graded and ungraded) is critically important to success in this class. I expect a MINIMUM of two hours per week in work outside of class for every one hour of class. 2. Please silence cell phones, etc. during class. The interruptions caused by these are distracting and will not be tolerated. Laptop computers in class are allowed if they are being used exclusively for calculus. Students using laptops for other purposes will be asked to turn off their laptops or leave the classroom.

Honor Code: It is expected that each student in this class will conduct himself or herself within the guidelines of the Honor Code. All academic work should be done with the level of honesty and integrity that this University demands. Anyone caught cheating during a quiz, exam or on any other material submitted for grade, including the reporting of attendance at recitations, will be sent to the University Honor Committee for formal resolution to the situation. The use of cell phones and other electronic communication devices for any purpose during a quiz or an exam will be considered an honor code violation. The most likely recommendation given by the professor to the Honor Committee is failure of the class (not just the specific quiz, exam, etc.) if the student is found guilty of violating the Honor Code.

Course Outline (Tentative):

Sections	Topics
Chapter 1 (1.1-1.6)	Functions; Exponentials; Logarithms; Trig Functions; Inverse Functions
Chapter 2 (2.1–2.6)	Limit of a Function; Infinite Limits; Limits at Infinity; Continuous and Discontinuous Functions;
EXAM 1	(**Thursday, September 19**)
Chapter 3 (3.1–3.11)	Derivatives of Polynomials, Exponential, Trigonometric, Logarithmic Functions; Product Rule; Quotient Rule; Chain Rule; Implicit Differentiation; Rates of Change, Related Rates
Chapter 4 (4.1–4.8)	Maxima and Minima; Optimization; Mean Value Theorem; Derivatives and Graphs; L'Hopital's Rule; Indeterminate Forms; Antiderivatives
EXAM 2	(**Thursday, October 31**)
Chapter 5 (5.1–5.6)	Area and Distance; Definite Integral; Indefinite Integral; Fundamental Theorem of Calculus; Substitution
FINAL EXAM	*Chapters 1–5* (**DATE AND TIME NOT YET CONFIRMED!**)

Ungraded Homework (Thomas Calculus: Early Transcendentals, Ed. 14)

(1.1): 1-10,13,15-22,23,25,28,29,37-40,47-50,69,70,76

(1.2): 1-8,11,15,16,17,18,23,24,25,26,37-40,49,52,59-62,69,71,73

(1.3): 13-16,31,32,35-38,55

(1.4): 1,2,17,19,25,27,29

(1.5): 1,2,3,5,7,9,10,11-20,21-24

(1.6): 1-6,7,8,11-14,19,21,29,31,41,49,51,55,69,73

(2.1): 1,2,4,5,7,9,25

(2.2): 1-4,7,8,11,13,21,23-26,31,35,37,43-46

(2.3): 1,2,7,8,15,16,31,32

(2.4): 1-4,6,7,13,14,15,16,23,25,27

(2.5): 1-10,13,15,17,33,34,48,49,50,55,56

(2.6): 1-8,9,10,13,15,17,19,21,23,25,35,37-44,49,50,63,64,65,67,75,76

(3.1): 1,2,5,9,11,17,23

(3.2): 2,3,9,13,27-31,35,45,47,49

(3.3): 1-17(odd), 21,23,31,34,35,41,43,53,54,76,77,79

(3.4): 1,2,7,12,13,17,32

(3.5): 1-8,17,23,24,35,38

(3.6): 1-21(odd),25,31,35,43,45,49,59,69,75,77,81,87,89

(3.7): 1-12,33,34

(3.8): 1-4,11-21(odd),41,43,47,67-77(odd)

(3.9): 1,3,5,9,11,13-16,21-24,33,34

(3.10): 1-6,13,14,27,33,39

(3.11): 1-3,7-10,17,19,20,39,41

(4.1): 1-6,11-14,15,17,18,21-31(odd),45,47,49,65

(4.2): 1-6,9,14,17,52

(4.3): 1-7(odd),15,16,19-35(odd),67,68,71

(4.4): 1,3,5,7,9-23(odd),41,43,45,59,61,63,81,83,85,87,89,109,110,111,112

(4.5): 1-6,7,9,11,13,15,17,19,35,41,75,76

(4.6): 1,2,9,10,15,44,64

(4.7): 1,3,10,11

(4.8): 1-23(odd),25-53(odd),91-99(odd),115-118

(5.1): 1-8

(5.2): 1-15(odd),19,21,23,25,29

(5.3): 1-7(odd),9,15,17,19

(5.4): 1-13(odd),35-38,39,41,43,57,59,61

(5.5): 1-7

(5.6): 1-13(odd),49,51