Marshall University Syllabus
Department of Mathematics

MTH 229(CT) Section 102 Fall 2023

Course Title:	Calculus/Analytic Geometry I (CT)
Course Number:	MTH 229 -- Section 102 -- CRN 2791 -- Credit: 5 Hours
Textbook:	Calculus, Early Transcendental by Stewart, Ninth Edition
Sections Covered:	1.1-1.5, 2.1-2.8, 3.1-3.11, 4.1-4.9, 5.1-5.5
Course Description:	An introduction to analytic geometry. Limits, derivatives, and integrals of the elementary functions, functions of one variable, including the transcendental functions.
Calculator:	TI-83 or higher, calculators may not be allowed for some problems in exams.
Core Credits	This course fulfills a Core I CT requirement (Mathematical & Abstract Thinking, Information and Technical Literacy, and Oral, Written, and Visual Communication) and Core II Math requirement.
Prerequisites:	ACT Math 27 or SAT Math 610 or MTH 132 "C" or higher
Meeting Time:	MTWRF: 12:00 – 12:50 PM
Classroom:	Smith Hall 513
Instructor:	Dr. Basant Karna
Office:	Smith Hall 715
Office Hours:	MTWR 10:00-12:00 PM, (Others by appointment)
Phone/Email:	Phone: (304) 696-4332, Email: karna@marshall.edu
Course Goals	1. To give students an understanding of the fundamental concepts of calculus and an appreciation of its many applications. 2. To develop critical thinking skills by asking students to convert real-world problems into forms suitable for calculus and interpret the results of calculus in real-world problems. 3. To provide students with a deeper understanding of the mathematics that is used in their science and engineering courses. 4. To develop facility in using graphing calculators to solve mathematics problems. 5. To satisfy program requirements.
Course Objectives:	1. Students should be able to evaluate limits, derivatives, and integrals symbolically. 2. Students should be able to approximate limits, derivatives, and definite integrals from tabular and graphical data. 3. Students should be familiar with the definitions of limits, derivatives, and integrals; be able to apply these definitions to test properties of these concepts; and be able to produce verbal arguments and examples showing that basic properties hold or do not hold. 4. Students should be able to apply the techniques of calculus to answer questions about the analytic geometry of functions, including vertical and horizontal asymptotes, tangent lines, local extrema, and global extrema. 5. Students should be able to verbally explain the meaning of limits, derivatives, and integrals in their own words, both in general terms and in the context of specific problems.

Course Student Learning Outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed
Students will have an understanding of the fundamental concepts of calculus and an appreciation of its many applications.	Group work, class work, in-class exercises, board work, test reviews	Homework, class work, quizzes, projects, exams, final exam
Develop critical thinking skills by asking students to convert real-world problems into forms suitable for calculus and interpret the results of calculus in real-world problems.	Group work, class work, in-class exercises, board work, test reviews	Homework, class work, quizzes, projects, exams, final exam
A deeper understanding of the mathematics that is used in their science and engineering courses.	Group work, class work, in-class exercises, board work, test reviews	Homework, class work, quizzes, projects, exams, final exam
Students will develop facility in using graphing calculators to solve mathematics problems.	Group work, class work, in-class exercises, board work, test reviews	Homework, class work, quizzes, projects, exams, final exam
Reasoning: Calculus is a collection of reasoning techniques that allows one to understand how changing quantities behave. This understanding is fundamental to progress in science and engineering. Students will use mathematical reasoning in their study of calculus concepts to verify properties of the concepts they study, and they will use scientific reasoning to determine whether possible solutions are reasonable for a given situation.	Group work, class work, in-class exercises, board work, test reviews	Homework, class work, quizzes, projects, exams, final exam
Representations: Students will work with information specified in verbal, graphical, tabular, and symbolic forms. Many problems will require students to take information in one of these forms, analyze it, and create a solution in a different form. Students will be required to produce verbal explanations of the meanings of mathematical concepts, both in general and in the context of specific problems.	Group work, class work, in-class exercises, board work, test reviews	Homework, class work, quizzes, projects, exams, final exam
Information literacy: To solve the applied problems in this course, students must determine which information in the problem is relevant to the solution, access this information and use it to obtain a mathematical solution, and then translate the mathematical solution back into the language of the original problem.	Group work, class work, in-class exercises, board work, test reviews	Homework, class work, quizzes, projects, exams, final exam

Course Contents:	- Review of college algebra - Limits of functions of one variable - Derivatives of functions of one variable - Applications of Derivatives - Integrals of functions of one variable
Attendance Policy:	Attendance is required and you must come with your text. Having more than **25%** absences may result in a course grade of **F**! Absences which can be excused include COVID-19 related absences, illness, emergencies, or participation in another university activity. Excused absences must be approved by the office of the dean of students.
Grading Policy:	A. *Exams*: There will be 3 exams given in class during the semester. B. *Homework Problems*: Homework problems are assigned and will be collected. You are responsible for reading the text, working the exercises, coming to office hours for help when you're stuck, and being aware of the dates for the major exams. Classwork Problems are assigned in class. C. *Final Exam*: There will be a two-hour final exam on December 8 (Friday) at 10:00 AM.
Points Distribution:	Attendance/Teaching Eval/Artifact 50 Pts Homework Assignments 100 Pts 3 Exams 300 Pts Final Exam 100 Pts --- Total Points: 550 Pts
Class Grades:	The semester grade will be based on the percentage of the 550 total possible points, using the following scale. A: 90 -100 %, B: 80 - 89 %, C: 70 - 79 %, D: 60 - 69 %, F: 0 - 59 % Note: The class score will be posted on Blackboard: https://www.marshall.edu/design-center/
Make-ups:	A. *Exams*: Making up a missed exam is possible only for serious and unavoidable circumstances. B. *Final*: If you don't take final exam, you will receive an "F" for the class.
Exam Dates	Exam 1 – Sep 15, Exam 2 – Oct 13, Exam 3 – Nov 10 (Fridays) Final Exam: December 8 @ **10:00 AM** (Friday)
Important Dates:	• August 28, Monday – "W" Withdrawal period begins • September 4, Monday – Labor Day – No Class • November 17, Friday – Last day to drop • November 20, Monday – November 24, Friday – Thanksgiving Break • December 1, Friday – Last class day
Academic Calendar	For beginning, ending, and add/drop dates, see the Marshall University Academic Calendar (URL: http://www.marshall.edu/academic-calendar/).
Disruptive Actions:	If your actions become disruptive or distracting for me or another student, you will be asked to cease your behavior. If you choose to continue, you will be asked to leave. These will count as **unexcused absences**.
Free Tutoring:	In Smith Hall 625 https://www.marshall.edu/math/tutoring/
Coming Late:	Students should come on time and stay in the class for entire class. If you are late by more than 5 minutes, you will be considered absent.
Artifact Upload:	You are required to upload an artifact to Blackboard by the end of semester.

University Policies	By enrolling in this course, you agree to the University Policies. Please read the full text of each policy (listed below) by going to MU Academic Affairs: University Policies. (URL: http://www.marshall.edu/academic-affairs/policies/) • Academic Dishonesty Policy • Academic Dismissal Policy • Academic Forgiveness Policy • Academic Probation and Suspension Policy • Affirmative Action Policy • Dead Week Policy • D/F Repeat Rule • Excused Absence Policy for Undergraduates • Inclement Weather Policy • Sexual Harassment Policy • Students with Disabilities (Policies and Procedures) • University Computing Services Acceptable Use Policy

Exam 1 (September 15 - Friday) Sections 1.1, 1.3, 1.4, 1.5, 2.2, 2.3, 2.5, 2.6
Exam 2 (October 13 - Friday) Sections 2.7, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6
Exam 3 (November 10 - Friday) Sections 3.8, 3.9, 3.10, 4.9, 5.1, 5.2, 5.3
Final (December 9 - Friday) Sections 5.4, 5.5, 4.1, 4.2, 4.3, 4.4, 4.5, 4.7

Course Schedule

Week	Sections	Topics Covered
1	1.1, 1.2, 1.3, 1.4	Brief algebra review
2	1.5, 2.1, 2.2	Introduction of limits, Basic limit laws
3	2.3, 2.5, 2.6	Algebraic limits, Continuity, Limits at infinity
4	2.7, 2.8, Test Review	Introduction of derivative, Derivative function, **Exam 1 on Sep 15**
5	3.1, 3.2, 3.3	Algebraic derivatives, Product/Quotient rules, Trig derivatives
6	3.4, 3.5, 3.6	Chain rule, Implicit differentiation, Logarithmic functions
7	3.7, 3.8, 3.9	Rates of change, Exponential growth/decay, Related rates
8	3.10, Test Review	Linearization, **Exam 2 on Oct 13**
9	3.11, 4.9, 5.1	Hyperbolic Functions, Antiderivatives, Finite sum approximations
10	5.2, 5.3, 5.4,	Definite integral, Fundamental Theorem, Indefinite integrals
11	5.5, 4.1, 4.2	Substitution rule, Extreme values, Mean value theorem
12	4.3, Test Review	Shapes of graphs, **Exam 3 on Nov 10**
13	4.4, 4.7	L'Hôpital's rule, Optimization
14	No Class	November 22, Monday – November 27, Saturday - Thanksgiving
15	4.5, 2.5, 4.8, Review	Asymptotes, Graphing, IVT, Newton's method
16	Final Exam	**Final Exam on Dec 8, 10:15-12:15 PM**