MATH 131-03, Calculus and Analytic Geometry I  
Fall 2019

Instructor: Dr. Andrew Phillips  
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Office: Weir 246  
Office hours: MWF 10-11, 1-2 or by appointment  
Class time and location: MWF 2-2:50 in Weir 202

Text: Calculus: Early Transcendentals, 3rd ed, by Briggs, Cochran, Gillett, and Schulz. You can either buy a hard copy or an ebook. You will need a MyMathLab access code. We will cover Chapters 2-5 and part of 6 in the book.

Course description: This is a first course in calculus and analytic geometry. It includes introductory concepts in analytic geometry, limits, continuity, differentiation, applications of the derivative, the mean value theorem, the definite and indefinite integral, and applications of the integral.

Prerequisites: MATH 103 and 104 or the equivalent passed with a grade of C- or better; or ACT Math score of at least 30 or SAT Math score of at least 670; or a score of at least 20 on the calculus readiness math placement test; or MATH 104 and either ACT Math score of at least 26 or SAT Math score of at least 590.

Place in curriculum: This course is a New Mexico general education and institute requirement.

Student learning outcomes: Upon completion of this course, students should be able to:

1. Limits  
   a. Use limit notation;  
   b. Compute limits or determine when a limit does not exist;  
   c. Use limits to decide if a function is continuous;  
   d. Use limits to decide if a function is differentiable;  
   e. Use limits to determine asymptotes;

2. Derivatives  
   a. Find the derivative of a simple function by using the definition of the derivative;  
   b. Find the derivative of algebraic and transcendental functions using the general power rule, product rule, quotient rule, chain rule, implicit differentiation, and the linearity of the differential operator;  
   c. Describe the meaning of the derivative as a rate of change in a variety of contexts;  
   d. Use derivatives to sketch functions, showing critical points and inflection points, noting monotonicity and concavity, and connecting these to features found algebraically, such as intercepts and asymptotes;  
   e. Compute local linear approximation;

3. Integrals  
   a. Compute definite integrals using the limit definition and sigma notation;  
   b. Approximate definite integrals using finite sums;  
   c. Compute indefinite integrals by identifying them with antiderivatives;  
   d. Compute definite and indefinite integrals using substitution;  
   e. Describe the meaning of the integral in a variety of contexts;

4. Applications of calculus  
   a. Solve optimization problems, related rate problems, and motion problems involving position, velocity, speed, and acceleration using differentiation and integration;  
   b. Compute the area bounded by functions and vertical lines;
c. Be able to apply theorems of calculus such as the Fundamental Theorem, the Intermediate Value Theorem, the Mean Value Theorem, the Mean Value Theorem of Integration, and the Extreme Value Theorem.

**Homework:** There will be written homework assigned every Wednesday and due the following Wednesday in class. Homework assignments and grades will be posted on the Canvas site for this course. *No late homework will be accepted for any reason.* There will also be assignments posted through MyMathLab. Your lowest homework grade will be dropped. Each written assignment must be submitted with a cover page stapled to the top, only including your name and assignment number.

**Exams:** There will be four in-class exams and a cumulative final exam. Calculators and online computing programs (such as Wolfram Alpha) are allowed on homework assignments, but *calculators may not be used during exams.* If you are forced to miss an exam for a legitimate reason, please inform me before the scheduled date if this is at all possible. Unnecessary delay will diminish your chances of being allowed a make-up.

**Lab:** MATH 131L is a co-requisite for this class. You may register for any section of lab.

**Grading:** Your grade will be determined as follows: written homework 5%, MML 5%, each in-class exam 10%, lab 20%, final exam 30%. Attendance and participation may be included, at my discretion, in your final grade.

**Academic honesty:** New Mexico Tech’s academic honesty policy for undergraduate students is found starting on page 64 of the NMT undergraduate catalog. You are responsible for knowing, understanding, and following this policy.

**Sources of help:** If you are struggling with the homework or need assistance preparing for an exam, please get help. You can come see me during my office hours or set up an appointment to meet at a special time. Other places for help: the drop in tutoring lab in Weir 220 and the Office of Student Learning in Speare 110 both offer free tutoring.

**Reasonable accommodations:** New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. In addition, New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call 575-835-6619.

**Title IX reporting:** Sexual misconduct, sexual violence, and other forms of sexual misconduct and gender-based discrimination are contrary to the University’s mission and core values, violate university policies, and may also violate state and federal law (Title IX). Faculty members are considered “Responsible Employees” and are required to report incidents of these prohibited behaviors. Any such reports should be directed to Tech’s Title IX Coordinator (Dr. Peter Phaiah, 20D Brown Hall, 575-835-5187, titleixcoordinator@nmt.edu ). Please visit Tech’s Title IX Website (www.nmt.edu/titleix) for additional information and resources.