MTH243-01
Survey of Calculus
Fall 2022

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Office Hours: MW 9:30 – 11:00, 2:30 – 4:30
TR 11:00 – 2:00
F 10:00 – 12:00 by appointment

Class Schedule: MW 11:00- 12:15 Spencer 245

Prerequisite/Description:
The student should have completed College Algebra (MTH 203), or the equivalent, with a "C" or better. This course is intended for those students who need an introduction to the fundamental concepts of calculus. It is designed for students majoring in business, agriculture, and the social sciences. This class cannot be taken for credit after successful completion of MTH245.

Resources:
Text: *Brief Applied Calculus*, James Stewart, Daniel Clegg, Brooks/Cole Cengage Learning, Copyright 2012, ISBN-13: 978-0-534-42382-7, ISBN-10: 0-534-42382-5

Required Materials:
TI-83 or 84 Calculator, 3-ring notebook, college rule 3-hole paper, graph paper or graph stamp, cardboard folder, mechanical pencils with extra erasers, small pack-colored pencils, straight edge.

Course Description: Polynomial calculus course that includes exponential growth and decay with focus on applications. Not intended to satisfy the major requirements for BS/BA in mathematics. The student will demonstrate a basic understanding of application for the following calculus related topics: limits, continuity, differentiation, antiderivatives, definite and indefinite integration, exponential and logarithmic functions, rate of change, slope of a function, *Applications include* graphing functions using derivatives, optimization, and applied problems in the management of science and economics.

Program Outcomes: This course is intended for those students who need an introduction to the fundamental concepts of calculus. It is designed for students majoring in business, agriculture, and the social sciences. The knowledge and critical thinking skills acquired will enable students to analyze problems and to arrive at intelligent conclusions, balancing conceptual understanding with technical skills.

- Use mathematical models to describe data applications to solve problems which they encounter in the workplace.
- Possess technological skills to identify, locate, and process information.

Rationale: An objective of post-secondary education is to provide a core of knowledge that is shared with most educated people. By studying and developing a deeper understanding of mathematical concepts, students can better analyze, problem solve, and prepare critical thinking strategies for real world scenarios.

Course Objectives: Upon successful completion of MTH 243 Survey of Calculus, the student should be able to:

1. Perform and solve basic differentiation and integration problems using appropriate vocabulary and technology.
2. Use critical thinking to formulate decisions and problem solving based on reasoning and analysis.
3. Appropriately use technology to supplement and enhance conceptual understanding, visualization, and inquiry.
4. Synthesize information from a variety of sources to solve problems and interpret results.
5. Demonstrate understanding of functions including linear, polynomial, logarithmic, and exponential.
6. Graph equations using derivatives by hand and on the graphing calculator.
7. Demonstrate an understanding of the applications of differentiation and integration.

Students will demonstrate mastery of the above objectives by grades of C or above on quizzes, tests, and the final exam.

Course Conduct: The class will be taught using a combination of lecture, group interaction, question and answer approach, and independent study. New topics will be demonstrated using the board, overhead projector, and TI 84+ Smartview computer program for support of graphing calculator use. Students are strongly encouraged to discuss concepts and examples as opportunities are presented during instructor presentation. It is the student's responsibility to inform the instructor when a concept is confusing or otherwise unclear.

Topical Course Outline and Proposed Schedule

Class Meeting	Start Date	Lesson	Topic
Week1-3	08/22	2.1	The Derivative
		2.2	Limits
		2.3	Rates of Change and Derivatives
		2.4	The Derivative as a Function
Week 4-6	09/12	3.1	Shortcuts to Finding Derivatives
		3.2	Introduction to Marginal Analysis
		3.3	The Product and Quotient Rules
		3.4	The Chain Rule
		3.5	Implicit Differentiation and Logarithms
		3.6	Exponential Growth and Decay
Week 7-9	10/3	4.1	Related Rates
		4.2	Maximum and Minimum Values
		4.3	Derivatives and the Shapes of Curves
		4.4	Asymptotes
		4.5	Curve Sketching
		4.6	Optimization
		4.7	Optimization in Business and Economics
Week10-12	10/24	5.1	Cost, Area, and the Definite Integral
		5.2	The Fundamental Theorem of Calculus
		5.3	Net Change Theorem and Average Value
		5.4	The Substitution Rule
Week 13-14	11/14	6.1	Areas Between Curves
		6.2	Applications to Economics
		6.3	Applications to Biology
Week 15	11/28		**Review for Final**
Week 16			**Final Exam**

Important Dates:

August 22	M	Classes begin
September 5	M	Labor Day holiday (no classes, campus closed)
October 3-7	M-F	Priority Registration for Spring
October 17	M	Mid-semester/first 8-week classes final grades due
November 21-25	M-F	Thanksgiving holidays begin (no classes, offices open W)
December 6	F	Classes end/Last day to drop a class with a W
December 7-13 December 14	M-R F	Final exams (16th week) Grades due

UA Rich Mountain Credit Hour Calculator: For every course credit hour, in a summer session, you should expect to spend at least three clock hours per day of concentrated attention on course-related work, including but not limited to time attending class, as well as out-of-class time spent completing homework, seeking help from instructor or tutors, preparing for upcoming quizzes/tests/exam, reviewing material, problem solving, and organizing your notebook. For a three-hour course, a typical student should expect to spend at least nine hours per day dedicated to this course. This includes the time spent in class. Please see credit hour calculator attached to end of syllabus.

Course Requirements / Evaluation (Grading):

Tests are 30% of your final grade. Three tests are scheduled.
Class Attendance & Participation 10%
Homework Assignments 25%
Research & Presentations 15%
Final Exam 20%

The final exam is comprehensive and will include problems from the chapters we have covered in class.

90 – 100 = A **80 – 89 = B** **70 – 79 = C** **60 – 69 = D** **0 – 59 = F**

Criteria for Credit: Homework must be neat and complete <u>all steps or an explanation</u> of how to arrive at the correct answer must be given. ***Answers alone are not acceptable***. Write the lesson topic at the top of the first page. Leave at least one blank line between problems. All graphs are to be accurately sketched on graph paper with all parts properly labeled and all work for the problem shown <u>on the same page as the graph</u>. For immediate feedback, you may check your answers for most assigned problems in the back of the book. *You will not receive credit for any problems not meeting the criteria for credit described above.*

Title IX and Discrimination Policy: UA Rich Mountain adheres to a policy that enables all individuals regardless of race, color, gender, national origin, age, religion, sexual orientation, veteran's status, or disability, to work and study in an environment unfettered by discriminatory behavior or acts. Harassment of an individual or group will not be condoned, and any person (student, faculty, of staff member) who violates this policy will be subject to disciplinary action.

Harassment that is considered discriminatory includes actions or conduct (verbal, graphic, gestural, or written) directed against any person or group with the intent to demean or create a hostile or threatening environment. It is not the intent of this policy to infringe upon or limit educational, scholarly, or artistic expression. Any person who believes he or she has been discriminated against should contact the Title IX Coordinator to obtain assistance and information concerning the filing of a complaint.

Face mask policy: Students are encouraged but not required to wear face masks in class and public spaces.

Attendance Policy: For attendance purposes, a student who is displaying symptoms of illness must email: contact.tracing@uarichmountain.edu to determine next steps for an excused absence related to COVID or flu. Contacting an instructor **DOES NOT** start this process or guarantee an excused absence.

Make-up Policy: Make up work should be competed promptly after the absence. A maximum of one week will be the guideline. Make-up exams are given only in instances of the most unavoidable, serious circumstances, and most probably on a paper sheet. Prior notice of absence from an exam is required. Upon return after an absence the student is expected to be prepared for the days' class activities.

Assignment Due Dates: Students are expected to submit the assignments and other works on or before the assigned due dates. You will be penalized for the late works depending on the number of days and full point and importance of the works assigned.

Computer and On-Campus Resources: Computer labs with printers are available in several places on campus including the Johnson Learning Commons. UA Rich Mountain offers students assistance with quality tutors available in the Student Support Services (SSS) and Learning Enrichment and Counseling Center (LEAC) in the Johnson Learning Commons. You may access www.tutor.com/uarichmountain at nights and weekends when SSS is not available.

Cell Phones: The use of cell phones in the classroom is prohibited. Turn cell phone off or set on vibrate and store it out of sight during class time. Cell phones will be taken up on test days.

Academic Dishonesty: Any suspicion of academic dishonesty will result in no credit for the paper in question.

Disability Policy: It is the policy of UA Rich Mountain to accommodate students with disabilities, pursuant to state and federal law. Any student with a disability who needs accommodations should contact the Vice Chancellor for Student Affairs Office, 394-7622, ext. 1460.

Arkansas Clean Air Act: In compliance with the Arkansas Clean Air Act, UA Rich Mountain is a smoke and tobacco free facility. Students and guests are to refrain from the use of all tobacco products while on campus.

Student Misconduct: Students committing misconduct are subject to disciplinary sanction(s) and/or restrictions. Misconduct or prohibited behavior includes, but is not limited to endangerment, harassment, disruption, sexual misconduct, illegal drugs and/or alcohol, fire or safety issues, gambling, property violations, computer violations or other violations as listed in the UA Rich Mountain catalog.

UA Rich Mountain Mission: UA Rich Mountain provides transformative education to all learners.

Campus Security: UA Rich Mountain strives to provide a safe learning environment; therefore, students who know of any security risk are to contact a college official. For more information follow this link and look under the title Health and Safety: http://www.uarichmountain.edu/at-a-glance/disclosures

Credit Hour Requirement Calculator for Summer Term				
Course Information				
Department, Course Number	Mathematics MTH243			
Course Title	Survey of Calculus			
Credit Hours	3			
Mode of Delivery	Traditional			
Days in Part of Term	18			
Level of Reading Material	Advanced/Scientific/Technical (2)			2
Reading Level of Students	Average Student (2)			2
Average Pages per Hour	11			
		Enter either week or term, not both		
Contact Hours		**Hours/Day**	**Hours/Term**	**Total Hours**
Lecture/Recitation			45	45
	Pages Asg'd	**Hours/Day**	**Hours/Term**	

Syllabus Items				
Daily Homework Assignments			60	60
Prepare for Chapter Tests			12	12
Prepare for Final exam			4	4
Study Assigned Examples	87			7.9
				0
Total Hours				128.9
Required Hours				112.5
Difference				Ok + 16.4