MTH255
Calculus II
Spring 2020

Instructor: Kim Meeks, BSE, MSE, Henderson State University
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Office Hours: MW 11:30 – 2:00, 3:15 – 3:30
TuTh 10:45 – 2:00, 3:00 – 3:30
F 10:00 – 12:00 by appointment

Time/Location: MW 9:30 – 11:30, Spencer 245

Prerequisites: Grades of C or better in MTH245 (Calculus I)

Resources: Text: Stewart. *Calculus—Early Transcendentals.* Eighth Edition. Cengage Learning © 2016

Required Materials:
TI- 84 Graphing 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. No ink pens.

Program Outcomes: The knowledge and critical thinking skills acquired in the general education component enable students to analyze problems, to arrive at intelligent conclusions, and to make reasoned choices in their professional and personal lives.

- Use computational mathematics, algebraic operations, and their practical applications to solve problems which they encounter at home and the workplace.
- Possess basic 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 computations, students can better analyze, problem solve, and prepare critical thinking strategies for real world scenarios. Technological skills with the graphing calculator are necessary for future math courses.

By studying and developing an ability to apply the mathematical principles of the second course in calculus, MTH255 Calculus II, the student will be prepared to continue in the study of the calculus sequence and to compete academically upon transfer to a four-year institution.

Course Description:

This course is designed primarily to serve students majoring in mathematics, engineering, physics, chemistry, and various other fields of science. The content of this course consists of a study of areas, volumes of solids of revolution, exponential and logarithmic functions, trigonometric and hyperbolic functions and their inverses, integration techniques, conic sections, indeterminate forms, improper integrals and infinite series. (ACTS: MTH2505)

Course Objectives: Upon successful completion of MTH 255 Calculus II and Analytic Geometry, the student should be able to:

1. Demonstrate understanding of areas, volumes of solids of revolution, integration techniques, conic sections, indeterminate forms, improper integrals, infinite series, and their applications.
2. Work with functions (exponential, logarithmic, trigonometric, and hyperbolic and their inverses) represented in a variety of ways—graphically, numerically, analytically, and verbally—and understand the connections among these representations.
3. Use critical thinking to formulate decisions and solve problems based on reasoning and analysis.
4. Communicate mathematics and explain solutions to problems both verbally and in written sentences.
5. Use graphing calculators to help solve problems, experiment, interpret results, and support conclusions.

Expected Student Learning Outcomes:
The student will understand and be able to apply the concepts involved with integration. Topics required are:

- Velocity and Net Change
- Area between curves
- Volumes of Solids of Revolution
- Work
- The student will understand and apply the following integration techniques (Calculus I or Calculus II):
    - Integration by parts
    - Trigonometric and substitutions
    - Integration of rational functions using partial functions
- Improper Integrals
- Applications to Physics, Engineering, Economics, and Biology
- Differential Equations
- Slope Fields and Euler's Method
- Separable Equations
- Sequences and Infinite Series

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 document 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.

Course Requirements / Evaluation (Grading): Students are assessed through homework assignments, daily participation, and exams.

Tests are 40% of your final grade. Five chapter tests are scheduled. Calculators are allowed on exams; however, some exams have both calculator active and non-calculator active portions. Exams include multiple choice and open response items.

Daily Work is 40% of your final grade (Homework 30%, Attendance 10%). Notes and assignments are graded on three levels: completion, correctness, and mathematical communication. Students are expected to explain the reasons for their processes and, in real-world problems, interpret the answers obtained in the context of the problem. Homework must be neat and complete. Each problem assigned has three parts: 1) the original problem complete with figures drawn, 2) <u>all steps or an explanation</u> of how to arrive at the correct answer, and 3) the final answer. ***Answers alone are not acceptable***. Use pencils and straight edge paper; no ink or ruffles please. Write the lesson topic at the

top of the first page. Label each page with your name and lesson number in the top right hand corner. Work in two columns if possible. Highlight final answers with a yellow highlighter. Leave a 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 on the same page as the graph. 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.*

Completed notes are to follow homework papers. The practice test with all work shown is to follow the notes. The note taking guide and practice test must be complete for full credit as assignments.

Final Exam is 20% of your final grade. The final exam is comprehensive. Problems are similar to chapter test problems.

Course Grades

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

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 nights and weekends when SSS is not available.

Attendance / Make-up Policy: No make-up exams will be given. If you miss an exam, the missing grade will be replaced by the final exam score at the end of the course. Deliberately missing an exam is not advised due to the comprehensive nature of the final exam and the possibility of missing a future exam. Homework portfolios are due just before taking the exam. Late portfolios will be severely penalized. The student is responsible for instruction missed during class by studying the material in the book, seeking help from the teacher and/or student support services, and by getting class notes from the teacher or another student.

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: University of Arkansas Rich Mountain exists to provide all residents of the Ouachita Mountain Region with exemplary educational and enrichment opportunities to improve the quality of life and standard of living.

UA Rich Mountain Credit Hour Calculator: For every course credit hour in an 8 week course, you should expect to spend at least six clock hours per week 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 four hour course, a typical student should expect to spend at least 24 hours per week dedicated to this course. This includes the time spent in class.

Credit Hour Requirement Calculator

Course Information				
Department, Course Number	Mathematics			
Course Title	Calculus II			
Credit Hours	4			
Mode of Delivery	Traditional			
Weeks in Part of Term	8			
Level of Reading Material				
Reading Level of Students	Above Average Student (1)			1
Average Pages per Hour	13			

Enter either week or term, not both

Contact Hours		**Hours/Week**	**Hours/Term**	**Total Hours**
Lecture/Recitation			60	60

Syllabus Items	**Pages Asg'd**	**Hours/Week**	**Hours/Term**	
Weekly Homework Assignments		4		70
Prepare for Chapter Tests			12	12
Study Assigned examples	80			6.2
Prepare for Final				4
				0
				0
				0
				0
				0
				0

Total Hours	152.2
Required Hours	150
Difference	Ok + 2.2

Tentative Course Outline: Calculus II Spring 2020

Wk	Day	Date	Lesson	Topic	Assignment	# Problems
1	M	1/13	6-1	Areas Between Curves	Pg. 434 # 1, 3, 9, 13, 15, 17, 23, 31, 33, 35, 41, 47, 57.	13
	W	1/15	6-2	Volumes: Slice, Disk,Washer	pg. 446 # 1, 5, 11, 15, 31, 35, 53, 55, 57.	9
2	M	1/20	6-3	Volumes by Cylindrical Shells	pg. 453 #1, 7, 9, 13, 15, 25, 37	7
	W	1/22	6-4	Work	pg. 458 # 1, 3, 5, 9, 13, 17, 21, 23.	8
3	M	1/27	6-5	Average Value of a Function	pg 463 #1, 5, 7, 9, 11, 13, 15, 17, 19.	9
	W	1/29		Review/Practice Test		20
4	M	2/3		**Exam Chapter 6**		
			7-1	Integration by Parts	Pg. 476 # 1, 3, 9, 11, 15, 19, 21, 25, 29, 33, 37.	11
	W	2/5	7-2	Trigonometric Integrals	Pg. 484 # 1, 3, 7, 11. 13, 15, 23, 35. 41, 47, 61.	11
5	M	2/10	7-3	Trigonometric Substitution	pg. 491 #1, 3, 7, 13, 17, 21, 29, 33.	8
	W	2/12	7-4	Integration by Partial Fractions	pg 501 # 1, 5, 9, 13, 15, 17, 21, 29, 31, 49.	10
6	M	2/17		*Winter Break*	*– No Class on Monday–*	
	W	2/19	7-5	Strategy for Integration	Pg. 507 #1, 15, 25, 31, 33, 37	6
7	M	2/24	7-6	Integration using Tables and Computers	pg. 512 #1, 5, 9, 13, 17, 21, 25, 29, 33	9
	W	2/26	7-7	Approximate Integration	Pg. 524 #1, 9, 29, 31a.	4
8	M	3/2	7-8	Improper Integrals	pg 534 #1, 5, 9, 13, 17, 21, 29, 31, 37, 41, 45, 49, 53	13
	W	3/4		Review/Practice Test		20
9	M	3/9		**Exam Chapter 7**		
			8-1	Arc Length	pg 548 #1, 5, 9, 17, 21, 25, 29, 33, 37.	9
	W	3/11	8-2	Area of a Surface of Revolution	pg 555 #1, 5, 7, 9, 13, 15.	6
10	M	3/16	8-3	Applications of Physics and Engineering	pg. 565 #1, 11, 13, 21, 23, 27, 33, 37.	8
	W	3/18	8-4	Applications of Economics and Biology	Pg 572 #1, 5, 7, 9, 11, 21, 23.	7
	MW	3/23		*Spring Break*	*No classes*	

11	M	3/30	8-5	Probability	Pg. 579 #1, 3, 5, 11, 17	5
	W	4/1		Review/Practice Test		20
12	M	4/6		**Exam Chapter 8**		
			9-1	Modeling with Differential Equations	pg. 590 #1, 5, 7, 9, 13	5
	W	4/8	9-2	Direction Fields and Euler's Method	pg. 597 #1, 3, 5, 21, 23.	5
13	M	4/13	9-3	Separable Equations	Pg. 605 #1, 5, 13, 19, 29, 45.	6
	W	4/15	9-4	Models for Population Growth	Pg. 617 # 1, 7, 15.	3
14	M	4/20	9-5	Linear Equations	pg. 625 # 1, 5, 9, 15, 27	5
	W	4/22		Review/Practice Test		20
15	M	4/27		**Exam Chapter 9**		
			11-1	Sequences	Pg. 704 #3, 5, 7, 9, 13, 15, 23, 25, 47, 57.	10
	W	4/29	11-2	Series	Pg. 715 #53, 19, 23, 37, 43, 51, 61, 69	8
				Review for Final		
		TBA		**Final Exam**		

Important Dates:

February 10 (M)	Four week grades due
February 17 (M)	Winter Break
March 9 (M)	Eight Week (Mid-term) grades due
March 23-27	Spring Break
April 6-10 (M-F)	Priority Registration for Summer and Fall
April 13 (M)	Twelve week grades due
April 29 (W)	Honors Evening
May 1 (F)	Last day of classes/ last day to drop the class with a W
May 4 - 7 (M - Th)	Final Exams
May 7 (F)	Graduation; Grades due