Math 122: Calculus II

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Student Help Hours (Formerly known as Office Hours) MWF 1:10 - 2:10 pm, Th 10:15 am - noon, or by appointment. Come by my office or join me on Zoom, whichever is easier for you.

Course Description This course provides a continuation of the study of calculus. Topics to be studied include applications and techniques of integration, applications and the calculus of functions of several variables, and sequences and series and their applications.

Learning Outcomes By the end of the course, successful students will be able to:

- apply the theory of differentiation and integration to model and solve real-world problems.
- apply techniques of differentiation and integration to solve problems involving functions of two or more variables.
- determine the behavior of infinite series and understand the role of power series and Taylor series in modern mathematics.
- recognize the role of technology in Calculus, understand when it should be used, and be aware of its limitations.

Course Materials

Textbook: *Calculus: Early Transcendental Functions* Smith and Minton, 4th edition
Devices: Graphing calculator, access to a computer with Mathematica (see Inquire for how to access Mathematica)

Important Dates We will have four in-class tests and a final exam. Each test will focus on the material learned since the last test, but will (necessarily) contain previous material. The final will be comprehensive. **If you have a conflict with one of these dates please email me ASAP.**

Test 1	**Friday 2/9, in class**
Test 2	**Friday 3/1, in class**
Test 3	**Monday 4/1, in class**
Test 4	**Tuesday 4/23, in class**
Final Exam	**Monday 4/29, 2 - 5 pm**

Course Grades The final course grade is determined in the following way:

Homework & Activity Responses	**28%**
Labs (3.5% each)	**21%**
Tests (9% each)	**36%**
Final Exam	**15%**

A grade scale will be determined after final grades are computed, but will be no worse than the scale given below. Attendance and class participation will be considered when determining marginal grades.

		B+	87-89	C+	77-79	D+	67-69		
A	93-100	B	83-86	C	73-76	D	63-66	F	0-59
A-	90-92	B-	80-82	C-	70-72	D-	60-62		

Attendance Policy Class attendance is expected because doing well in this class is hard if you aren't here to work on the material with us. However, life happens and sometimes you have to miss. If you know in advance you're going to miss class, make sure you turn in any work due that day (Inquire makes this easy!). Let me know if you need help learning the material we're going to cover, whether that means getting connected with someone who will share their notes or coming to office hours with questions. If you are going to miss a test, let me know as soon as you can so we can figure out how to handle that. If you don't know in advance (because sometimes life happens unexpectedly), talk with me as soon as you can about what you can make up and how to get caught up. I will be as generous as I can while still keeping the class fair for all students.

Homework I will assign a graded homework problem each day. Submit your homework in class OR via Inquire as a PDF or Word file. (Picture files may not allow me to give you comments, so copy/paste pictures into Word or get a PDF scanner app on your phone.) These problems are due at the beginning of the next class so you can ask questions about them before we start new material. **Since I can't accept homework turned in after we've discussed it in class, late homework will usually not be accepted.** If you are unable to complete the homework on time for some reason, please contact me about that as soon as you can so we figure out how to handle the situation. I am happy to help with these problems, but you **may not** work on them with anyone but me.

Co-Curricular Activities The MCSP department and Roanoke College offer many opportunities to engage with mathematical ideas outside of classes. Members of this class are encouraged to attend many of these activities, however attending at least one is mandatory. Examples include MCSP Conversation Series talks and student research showcases - if you're unsure if a given activity makes sense for this purpose, please email me to ask. After you attend (preferably within one week), submit a brief response to the activity. Your response will count as part of your homework grade.

Labs We will have about 6 Mathematica labs where you will explore some applications of calculus with the help of Mathematica's computational and graphing abilities. More specific instructions for each lab will be given when it is assigned. Mathematica is available for free to all students. See Inquire or IT's website for instructions on how to get it.

Practice Problems After each section I will assign some problems from the book for practice. These problems are listed on Inquire. They will not be collected – the answers are in the back of the book, and they are your chance to make sure you understand the material so you can get help as soon as you realize you need it. Feel free to work with other students or a tutor on these problems.

Mask Policy Unless the college changes its policy, face coverings/masks are no longer required. However, anyone is welcome to wear a mask for some or all of the semester. **If you feel sick and plan to come to class, please wear a mask over your nose and mouth!** (The rest of the class thanks you in advance.)

Expected Work Policy This course expects you to spend at least 12 hours of work each week inside and outside of class.

Extra Resources Subject tutoring is available (including online) through the Center for Teaching and Learning (in Fintel Library).

Special Needs If you get any academic accommodations in this course, please let me know and provide your documentation as soon as you can - preferably within the first 2 weeks of the semester. (Check with the Center for Teaching and Learning for their scheduling guidelines.)

Academic Integrity I expect all of you to follow the Academic Integrity policies of Roanoke College. All graded work should be your own work! If you ever have questions about how these policies apply to our class please contact me. Any violations of these policies will automatically be turned over to the Academic Integrity Council.

Course Schedule
The following schedule is approximate and subject to change except for the test dates. It should give you an idea of the timing of the topics covered and assignments.

Day	Date	Topic	Labs
W	J 17	Intro	
F	J 19	5.5: Projectile Motion	
M	J 22	5.5 / Mathematica Intro	Lab 1 Assigned
W	J 24	5.6: Work	

F	J 26	5.6: Center of Mass, Hydrostatic Force	
M	J 29	6.2: Integration by Parts	**Lab 1 Due**
W	J 31	5.7: Probability	
F	F 2	5.7 / 6.6	
M	F 5	6.6: Improper Integrals	Lab 2 Assigned
W	F 7	Review	
F	F 9	**Test 1**	
M	F 12	12.1: Functions of Several Variables	**Lab 2 Due**
W	F 14	12.3: Partials / 12.7: Local Extrema	
F	F 16	12.2: Limits / 12.3: Partials	
M	F 19	12.4: Tangent Planes	
W	F 21	12.7: Global Extrema	
F	F 23	12.7	Lab 3 Assigned
M	F 26	Partial Antiderivatives	
W	F 28	Review	
F	M 1	**Test 2**	
	Spring Break		
M	M 11	13.1: Double Integrals	**Lab 3 Due**
W	M 13	13.1	
F	M 15	13.2: Area	
M	M 18	13.2: Volume	
W	M 20	13.2: Center of Mass	Lab 4 Assigned
F	M 22	9.4: Polar Coordinates	
M	M 25	13.3: Double Integrals in Polar Coordinates	
W	M 27	13.3	**Lab 4 due**
F	M 29	**No Class**	
M	A 1	**Test 3**	
W	A 3	8.1: Sequences	
F	A 5	8.2: Series	Lab 5 Assigned
M	A 8	**No Class**	
W	A 10	8.3: Integral Test	
F	A 12	8.5: Ratio Test	**Lab 5 due**
M	A 15	8.6: Power Series	
W	A 17	8.7: Taylor Series	Lab 6 Assigned
F	A 19	8.8: Applications of Taylor Series	
M	A 22	Review	

Tu	A 23	**Test 4**	**Lab 6 due W 4/24**
M	A 29	**Final Exam** 2 – 5 pm	