MATH122-B, Fall 2017: Calculus II

Instructor	Maggie Rahmoeller *Email:* rahmoeller@roanoke.edu	*Phone:* (540) 375-2505 *Office:* Trexler 270J

Class Meetings
MWF: 12PM-1PM in Miller 112
Thursday: Lab, 8:30-10AM in Trexler 372

Office Hours
Mondays 9:30AM-10:30AM
Wednesdays 9:30AM-10:30AM
Thursdays 10AM-12PM
Or by appointment (just shoot me an email!)

Course Objectives
This course provides a continuation of the study of calculus. Topics to be studied include more applications of the definite integral, sequences and series and applications of them, and vectors and functions of several variables.

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

• apply the theory of differentiation and integration to model and solve real-world problems.

• recognize a differential equation and be able to both solve basic differential equations and discuss what a differential equation tells you about the process it models.

• determine the behavior of infinite series and understand the role of power series and Taylor series in modern mathematics.

• utilize vectors in two-dimensional and higher-dimensional coordinate systems to model graphs and equations, and apply methods of Calculus to these graphs and equations.

• recognize the role of technology in Calculus, understand when it should be used, and be aware of its limitations.

Required Materials
Textbook: *Calculus: Early Transcendental Functions*, by Smith and Minton, 4th Edition
Lab Technology: Laptop with Mathematica installed
Mathematica Free Download: see https://webapps.roanoke.edu/www/it/mathematica/
Calculator: A calculator with graphing capabilities
Prerequisite: MATH 121 (Calculus I) or the equivalent

Commitment Hours
This course expects you to spend at least 12 hours of work each week inside and outside of class.

Course Grades
The following table lists the weights for the various forms of assessment for this class.

Homework & Participation	20%		Tests	40%
Labs	20%		Final Exam	20%

A grade scale will be determined after final grades are computed, but will be no worse than the scale given below:

		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		

Reading Notebook	The key to learning a topic in mathematics is participation. We will strive to have an active, rather than passive, classroom environment. The last page of the syllabus is a day-by-day outline of the sections that will be discussed in class. You are fully expected to have read the upcoming section before the class meeting! This does not mean you need to understand everything, but rather you should be familiar with the definitions and concepts from the sections. I will post questions on our Inquire page for each section of our textbook that we cover this semester. You will keep an online reading notebook (through Inquire) in which you will answer these questions and can include other notes about the reading material. I will check this notebook regularly, and this will count toward your homework and participation grade.
Homework	Homework will be assigned regularly in this class (virtually every class period) and may take several forms. Typically, it will be due at the start of the class period immediately following the assigning of the homework. Homework will be graded partly on effort and partly on correctness. Late homework is not accepted. If you miss class, get a friend to turn in your homework for you or email me a copy.
Quizzes	There may be written quizzes in this class. They may either be in-class quizzes or takehome quizzes. I may occasionally warn you about an upcoming quiz but you should be prepared to take a quiz on any given day, including lab days. These quizzes will always be extra-credit - any points earned will go toward your test grade.
Labs	The mathematics we will be learning has a large number of applications which we will explore during weekly technology labs. Many of our labs will be done using the Mathematica computer algebra system and all labs will last 1.5 hours (8:30AM-10AM) and typically require a problem set or lab write-up. You need to get a free license and download Mathematica from the website https://webapps.roanoke.edu/www/it/mathematica/ before the first lab. Attendance is required. You are also required to work in groups of 2 or 3 for every lab. Labs are due each Monday by 3PM.
Tests	Four tests will be given according to the schedule on page 4 of the syllabus. Each test will focus on the material learned since the last test, but as with most mathematics classes, the exam will necessarily require you to understand and remember things from the past. Note that weather and other changes in the course schedule may affect the material covered on tests, but unless a test day is canceled due to weather, the tests will happen as scheduled.
Final Exam	The final exam will be comprehensive and given during the scheduled time for the final exam for **Block 9, i.e. Monday, Dec 11 from 8:30-11:30AM**. The best way to review for the final is to review your performance on the four tests; focus on material that you did not master the first time around, and review the topics that you did master.
Attendance & Make-Up Work	Attendance is critical to the understanding of the material in the course; it is both required and expected. Any absence that is not discussed with the instructor prior to the missed class is considered unexcused. Unexcused absences may result in the lowering of the final grade (for example, a B to a B-). When absent, excused or unexcused, you are responsible for all material covered in class. **You will not be allowed to make up any work missed due to an unexcused absence.**

MCSP Conversation Series	The Department of Mathematics, Computer Science and Physics offers a series of discussions that appeal to a broad range of interests related to these fields of study. These co-curricular sessions will engage the community to think about ongoing research, novel applications and other issues that face our discipline. Members of this class are invited be involved with all of these meetings; however participation in **at least two** of these sessions is mandatory. After attending, students will submit a one page paper reflecting on the discussion. This should **not** simply be a regurgitation of the content, but rather a personal contemplation of the experience. This reaction paper will be counted as a quiz and should be uploaded to Inquire using the appropriate link. If you are caught leaving the talk early or being disruptive, you will receive a 0 on the assignment.
Disability Support Services	The Office of Disability Support Services, located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library, provides reasonable accommodations to students with identified disabilities. Reasonable accommodations are provided based on the diagnosed disability and the recommendations of the professional evaluator. Please contact JoAnn Stephens-Forrest, MSW, Coordinator of Disability Support Ser- vices, at 540-375-2247 or e-mail her (stephens@roanoke.edu) to schedule an appointment. If you have registered with DSS in the past, and would like to receive academic accommodations for this semester, please contact Ms. Stephens-Forrest at your earliest convenience, to schedule an appointment. Also, please note that arrangements for extended time on exams, testing, and quizzes in a distraction-reduced environment must be made at least 48 hours before every exam.
Academic Integrity	Students are expected to adhere to the Academic Integrity policies of Roanoke College. All work submitted for a grade is to be your own work! No electronic devices other than calculators can be taken out during any class or testing period (this includes cell phones; please turn them **off** before class). Note that looking at or using your cell phone during a test or quiz is considered a violation of Academic Integrity regardless of your purpose or intent in doing so .
Subject Tutoring	Subject Tutoring is a CRLA Nationally Certified Program located on the lower level of Fintel Library in room 005. Subject Tutoring offers individual appointments in 30-minute intervals for Lab Sciences, Modern Languages, Math and CPSC, Social Sciences, Business and Economics. Hours are Sunday - Thursday 4 p.m. - 9 p.m. For a list of tutorials or to make an appointment, go to www.roanoke.edu/tutoring.

Wed	Aug 30	7.1	Intro and Differential Equations
Thurs	Aug 31		**Lab 1: Intro to Mathematica**
Fri	Sept 1	7.1 & 7.2	Modeling with Differential Equations
Mon	Sept 4	5.5	Projectile Motion
Wed	Sept 6	5.6	Mass
Thurs	Sept 7		**Lab 2: Intro to Mathematica**
Fri	Sept 8	5.7	Probability
Mon	Sept 11	8.1 & 8.2	Sequences & Series
Wed	Sept 13	8.2	Infinite Series
Thurs	Sept 14		**Lab 3: Problem 1**
Fri	Sept 15	8.5	Ratio Test
Mon	Sept 18	8.5	Ratio Test
Wed	Sept 20		**Review**
Thurs	Sept 21		**Test 1** (Sections 7.1, 7.2, 5.5-5.7, 8.1 ,8.2, 8.5)
Fri	Sept 22	8.6	Power Series
Mon	Sep 25	8.6	Power Series
Wed	Sep 27	8.7	Taylor Series
Thurs	Sept 28		**Lab 4: Series Tutorial**
Fri	Sept 29	8.7	Taylor Series
Mon	Oct 2	8.8	Applications
Wed	Oct 4	8.9	Fourier Series: **No Class!**
Thurs	Oct 5		**Lab 5: Problem 2**
Fri	Oct 6	10.1 & 10.2	Vectors
Mon	Oct 9	10.3	Dot Product
Wed	Oct 11		**Review**
Thurs	Oct 12		**Test 2** (Sections 8.6-8.9)
Fri	Oct 13		What is Math?
		Fall Break	
Mon	Oct 23	10.4	Cross Product
Wed	Oct 25	10.5	Lines
Thurs	Oct 26		**Lab 6: Looking Ahead Tutorial**
Fri	Oct 27	11.1	Vector-Valued Functions
Mon	Oct 30	11.2	Calculus of Vector-Valued Functions
Wed	Nov 1	11.3	Motion
Thurs	Nov 2		**Lab 7: Problem 3**
Fri	Nov 3	10.6	Surfaces in Space
Mon	Nov 6	10.6	Surfaces in Space
Wed	Nov 8		**Review**
Thurs	Nov 9		**Test 3** (Sections 10.1-10.5, 11.1-11.3)

Tentative Schedule

Day	Date	Section	Topic
Fri	Nov 10	9.4	Polar
Mon	Nov 13	11.6	Parametric
Wed	Nov 15	12.1	Functions of Several Variables
Thurs	Nov 16		**Lab 8: Wild Card** take topic from list and work on indiv, write up solution
Fri	Nov 17		**No Class!!**
Mon	Nov 20	12.3	Partial Derivatives
			Thanksgiving Break
Mon	Nov 27	13.1	Double Integrals
Wed	Nov 29	13.1	Double Integrals
Thurs	Nov 30		**Lab 9: Problem 4**
Fri	Dec 1	13.2	Volume
Mon	Dec 4	13.3	Polar
Wed	Dec 6		**Review**
Thurs	Dec 7		**Test 4** (Sections 10.6, 9.4, 11.6, 12.1, 12.3, 13.1, 13.2)
Fri	Dec 8		Review
Day	**Dec #**		**Final Exam: Sometime**