

*Instructor:* Professor Erin Bodine  
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*Office:* Ohlendorf 422

*Office Hours:* MW 2:00 – 3:00 pm, T 1:00 – 3:00 pm,  
Th 2:00 am – 4:00 pm, and by appointment  
*Course website:* This course has a Moodle website.

**Section 121-01** meets MWF 9:00 – 9:50 am in Kennedy 205, T 10:00 – 10:50 am in Buckman 110

**Course Description:** Calculus is a powerful tool in modeling real world problems. This course provides an overview of a portion of calculus with some emphasis placed on applications. The style of this course may be different from your experience in previous math courses – even if you have studied some calculus in the past. Calculus is more than just rules for turning algebraic formulas into other algebraic formulas. Indeed, with the advances in current technology, much of the algebraic side of the subject can be done automatically by computers. Real understanding comes in knowing what the formulas tell you, and how to apply them in real and diverse situations. We will develop both a theoretical and conceptual understanding of the mathematics of calculus as well as the ability to “manipulate symbols.” Additionally, we will work on skills of mathematical justification and communication, that is, showing (with mathematical rigor) how a solution is arrived upon and follows from previously established mathematical truths. Every topic is presented *algebraically, numerically, in graphs, and in words*. You will be asked to engage the course material from all of these points of view. Lastly, much of the content of this course will be discovered through *active learning* in which you, with your classmates (and some guidance from your instructor) will “discover” some of the fundamental properties and theorems of calculus. To this end, you will be encouraged daily, in class, to explore and discuss the mathematics of calculus with your classmates.

**Prerequisites:** Success in calculus relies heavily on a solid foundation of algebra skills (*Algebra I & II, Geometry, Trigonometry, knowledge of exponential & logarithmic functions*). The course assumes a solid background in high school algebra. It does **not** assume any previous experience with calculus. If you have seen some calculus before, some of the topics may seem repetitive, but you should not assume that it will automatically be easy for that reason. (If you have studied most of the topics in this course before, talk to the instructor about whether this is the right course for you.)

**Course Content:** We will cover topics in Chapter 2 through 5.

- *Limits:* We will examine limits graphically, numerically, and analytically. We will study the precise mathematical definition of a limit (often referred to as the  $\epsilon$ - $\delta$  definition of a limit). We will study one-sided and infinite limits.
- *Continuity:* We will examine continuity graphically and analytically. We will study the properties of continuous functions and the intermediate value theorem.
- *Differentiation:* We will use limits to define the derivative of a function and utilize our notion of tangent lines to interpret the concept of a derivative graphically and as a rate of change. Various techniques of differentiation, such as the power, product, quotient, chain, and inverse rules, will be developed. Additionally, we will explore implicit differentiation.
- *Applications of Differentiation:* We will use information provided by the first and second derivatives of a function to aid in sketching a function and to examine problems of optimization.
- *Integration:* We will define the concept of an antiderivative and define some properties of antiderivatives. We will define and use Riemann sums to estimate the area under a curve. We will utilize the Fundamental Theorem of Calculus to find the exact area under a curve. We will develop the integration technique of substitution.

**Course Materials:**

- *Text:* Calculus Early Transcendentals by James Stewart. This course will attempt to cover through Chapter 5.
- *Guided Lecture Notes:* Guided lectures notes (by Section) will be posted on Blackboard. The first couple sections will be handed out on the first day of class. After that ***you are responsible for printing out the appropriate section of guided notes and bringing them to class.***
- *Supplemental materials:* You are responsible for all handouts given in class and materials posted on the course website.

Please note that we will not be using calculators in this course.

**Time Commitment:** In addition to the time spent in class (4 hours a week), you should expect to spend between 9 – 12 hours outside of class engaged in homework and study. If you choose to participate in the peer-led study groups (see last page of syllabus), count this as part of your study time. Please be aware of the level of time commitment for this course when planning extracurricular activities.

**Course Grading:**

Component	Frequency	% of Grade
Homework	collected each Wednesday at the beginning of class	15 %
Projects	3 total	15 %
Attendance/Feedback	collected daily	5 %
Exams	3 total (Feb 8, Mar 8, Apr 12)	45 %
Final Exam	at end of semester	20 %

*Homework:* A homework exercise set consisting of 5 problems will be assigned for each section of the text we cover. Additionally, each week you will be responsible for a reflective writing assignment consisting of three topics (one paragraph for each topic):

- (1) Summarize the main ideas discussed in the sections covered in that week’s homework assignments,
- (2) Discuss one problem or approach that made an impression on you, and
- (3) Detail your plans for the following week with regards to studying, the next homework assignment, work on projects, etc.

Homework will be collected each Wednesday at the beginning of class. If you are absent on a Wednesday, you are still responsible for making sure your homework is turned in to your instructor. No late homework will be accepted.

*Homework Collaboration Policy:* Working together with other people is a great way to learn mathematics. I encourage you to work together on the homework, if you find that it helps you to learn. However, homework for this course is also graded, as part of your final course grade. Each student must write up his or her own homework solutions. By handing in homework solutions to be graded, you are promising that you took part in solving the problems, and that you are not just copying someone else’s work. Handing in homework to be graded when you did not participate in solving the problems is a violation of the Honor Code.

*Homework Grading Rubric:*

<b>Section HW Total 20 points</b>				
<i>Graded Problem</i> 10 points	For each section a die will be rolled to determine which problem will be graded. If a 1-5 is rolled, the corresponding assigned problem will be graded. The graded problem will be graded in the same fashion that exam problems (also usually worth 10 points each) will be graded. If a 6 is rolled, 10 points are automatically awarded.			
<i>Completion</i> 5 points	1 point given for each of the assigned problems that is completed			
<i>Neatness</i> 5 points	1 point for writing your name, Calc 1 9:00, and the date in the upper right corner, and the section at the top of the page	1 point for stapling all pages of the assigned section together, paperclip and paper-folding do not count	3 points for neatness and layout of assigned problems: Problems are done in order; Writing is neat and clear and not too small; All steps towards achieving the solution are written out in an orderly, linear fashion; Correct mathematical notation is used; Any graphs drawn are clearly labeled (axes labeled, one or more points labeled)	
<b>Reflection Writing Total 10 points</b>				
<i>Completeness</i> 4 points	Only 1 topic addressed (0 points)	Only two topics addressed (1 point)	Three topics addressed, but major idea from the week not in summary, or sparse discussion of topic (2) or (3) (2-3 points)	Each of the three topics addressed including all major topics for the week and detailed discussion of topics (2) and (3) (4 points)
<i>Competency</i> 3 points	Discussions for topics (1) and (2) show complete lack of understanding of material covered that week (0 points)	Discussions of topics (1) and (2) show some gaps in understanding of the material covered that week (1 point)	Discussion of topics (1) and (2) show only minor gaps in understanding of the material covered that week (2 points)	Discussion of topics (1) and (2) demonstrate a clear understanding of the material covered that week (3 points)
<i>Correct Language</i> 3 points	Poor use of grammar, many typos, spelling mistakes, use of slang, etc. (0 points)	Some incorrect grammar, a few typos and spelling mistakes (1 point)	Correct grammar with some typos or minor spelling mistakes (2 points)	Correct grammar, no typos, no spelling mistakes, no use of slang (3 points)

*Attendance/Feedback:* There is a direct correlation between attendance and success in this course. You should plan on attending every class. At the end of every class you will be asked to provide some feedback on the lecture and activities of that particular class. Turning in this feedback will mark your attendance. Three unexcused absences will be excused, no questions asked. Any additional absences must be excused and accompanied by a memo or letter from the dean of students. If you are absent for any reason, you are responsible for all material and notes covered on the day of your absence.

*Exams:* Three exams will be given (Feb 8, Mar 8, Apr 12). A make-up exam will only be given if both of the following two conditions are satisfied:

1. You contact the instructor prior to the test being given (at least one week in the case of absence due to the attendance of an official school function).
2. You provide the proper documentation.

*Final Exam:* The final exam will cover all material covered in this course. Unless otherwise notified, the exam will be closed book and closed notes. See below for schedule based on your section.

**Section 121-01 (9:00 am):** Final Exam on Wednesday, May 4 @ 8:30 am (Kennedy 205)

Final letter grades are determined as follows:

A	93 – 100 %	C	73 – 76.9 %
A -	90 – 92.9 %	C -	70 – 72.9 %
B +	87 – 89.9 %	D +	67 – 69.9 %
B	83 – 86.9 %	D	63 – 66.9 %
B -	80 – 82.9 %	D -	60 – 62.9 %
C +	77 – 79.9 %	F	0 – 59.9 %

#### **Disability Services:**

If you need course adaptations or accommodations due to a documented disability, please contact the Office of Disability Services at Burrow Student Center, Fourth Floor, 901-843-3885. Hours: M-F, 8:30 am – 5:00 pm.

See <http://www.rhodes.edu/disabilityservices/default.asp> for details.

#### **Math Support Center:**

Calculus I (Math 121) is a course that is supported by the Math Support Center (MSC, <http://www.rhodes.edu/academics/18410.asp>). That means there are traditional drop-in peer tutoring and peer-led group study available, for free, at the Math Support Center located on the third floor “library” of Ohlendorf.

See <http://www.rhodes.edu/academics/18413.asp> for schedule for traditional drop-in one-on-one peer tutoring at the MSC.

For more information about peer-led group study, see the last page of the syllabus.

#### **Classroom Etiquette:**

Please be considerate of the instructor and your classmates around you. Come to class on time and stay the entire period. Turn off cell phones or any beeping/ringing devices during class (this means no sending text messages during class).

#### **The Honor Statement:**

You are expected to conduct yourself within the guidelines of the College’s Honor Code. If you have any questions about what is or is not allowed, please ask.

*The note that this syllabus is a guide and not a contract, and thus is subject to change at the discretion of the instructor.*