MATH 121 (Fall 2010) **CALCULUS I**

Instructor: Professor Erin Bodine
Email: bodinee@rhodes.edu
Office: Ohlendorf 422

Office Hours: M 12:00 – 1:00 pm, T 1:00 – 2:00 pm,
Th 10:00 am – 12:00 pm, F 12:00 – 2:00 pm, and by appointment
Course website: This course has a Moodle website.

Section 121-03 meets MTWF 10:00 – 10:50 am in Ohlendorf 225
Section 121-04 meets MTWF 11:00 – 11:50 am in Ohlendorf 225

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 all the topics in Chapter 1-5.

- *Functions:* We will review the different representations of a function and many of the basic functions explored in algebra and trigonometry (polynomials, trig functions, exponential and log functions, etc). We will review the basics of graphing a function and find the inverse of a function.
- *Limits*: We will examine limits graphically, numerically, and analytically. We will study the precise mathematical definition of a limit (often referred to as the ε-δ 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***.
- *Calculator*: We will make use of a graphing calculator throughout the course. Calculators should be brought to class each class meeting.
- *Supplemental materials*: You are responsible for all handouts given in class and materials posted on the course website.

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 are part of your study time. Please be aware of the level of time commitment for this course when planning extracurricular activities.

General Structure of the Course:
Class meetings on Mondays, Wednesdays, and Fridays will consist of a combination of lecture and group/solo active learning exercises. During each class you will be expected to communicate and collaborate with your peers on some or all of the active learning exercises. For each section of the text we cover, homework will be assigned. Homework assigned on any given day will be due the Wednesday after it is assigned, at the beginning of class. During class meetings on Tuesday we will go over a subset of the assigned homework exercises that the class agrees upon. After the homework is collected each Wednesday, a short quiz will be given with questions resembling those seen in the homework set turned in that day.

Example Schedule:

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
		08/25 Start Section 1.1	08/26	08/27 Finish Section 1.1 Start Section 1.2
08/30 Finish Section 1.2 Start Section 1.3	08/31 Review HW qu for Sections 1.1 & 1.2	09/01 Quiz on Sections 1.1 & 1.2 Finish Section 1.3	09/02	09/03 Finish Section 1.5
09/06 Finish Section 1.6	09/07 Review HW qu for Sections 1.3, 1.5, 1.6	09/08 Quiz on Sections 1.3, 1.5, 1.6 Start Section 2.1		

Course Grading:

Component	Frequency	% of Grade
Homework	collected each Wednesday at the beginning of class	5 %
Quizzes	beginning of each Wednesday class	20 %
Attendance/Feedback	given daily	5 %
Exams	3 total (Sep 14, Oct 5, Nov 16)	45 %
Final Exam	at end of semester	25 %

Homework: A homework exercise set will be assigned for each section of the text we cover. Homework will be collected each Wednesday at the beginning of class. The homework collected on any given Wednesday will consist of those sections completed during the previous three lecture classes (Wednesday, Friday, and Monday). Each Tuesday, we will go over a subset of the assigned homework exercises that the class agrees upon. Homework will be graded as follows: 2 pts if all sections of the homework are turned in and an earnest attempt has been made on every exercise, 1 pt if all sections of the homework are turned in but not all of the exercises have been attempted, 0 pts if some or all sections are not turned in or if the majority of the exercises have not been attempted. 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.

Quizzes: Quizzes are given each Wednesday at the beginning of class (don't be late). Quiz questions will resemble exercises seen in the homework set due that day. The lowest three quiz grades for each student will be dropped. No make-up quizzes will be given.

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.

Exam 1 will be held on 09/14/2010 and will test material covered through 09/06/2010.

Exam 2 will be held on 10/05/2010 and will test material covered through 09/27/2010.

Exam 3 will be held on 11/16/2010 and will test material covered through 11/08/2010.

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 121-03 (MTWF 10:00 am): Final Exam on Monday, Dec 13 @ 1:00 pm (Ohlendorf 225)

Section 121-04 (MTWF 11:00 am): Final Exam on Tuesday, Dec 14 @ 5:30 pm (Ohlendorf 225)

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 Suppport 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.
Schedule for traditional drop-in one-on-one peer tutoring at the MSC:

Math 121 Calculus I and Math 122 Calculus II					
Day	***Sunday***	***Monday***	***Tuesday***	***Wednesday***	***Thursday***
Time	8pm -- 10pm	8pm -- 10pm	8pm -- 10pm	8pm -- 10pm	8pm -- 10pm
Tutor	Carolyn Drobak	Melissa Coquelin	Kaetlin Taylor	John Wells	Ingrid Fan
Tutor's Email	drocm@rhodes.edu	coqml@rhodes.edu	taykd@rhodes.edu	berda@rhodes.edu	fanxi@rhodes.edu
Location	MSC	MSC	MSC	MSC	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.

Math Support Center Peer-Led Study Groups for Calculus I

This semester the Math Support Center is offering you the opportunity to be member of a mentored study groups.

Should you be in a study group?

- Do you enjoy working with friends?
- Do you enjoy seeing how other people solve problems?
- Do you enjoy sharing your methods for solving problems?
- Do you learn a topic better if you talk about it?
- Do you like feeling that "We're all in this together" feeling?

If the answer to any of these questions is *yes* then being in a peer mentored *study group* might be *for you*.

(If the answer is no to every question, then working by yourself might be best for you, and the Math Support Center has trained, experienced tutors on duty to give you one-on-one help when you need it.)

What should you do to form a study group?

- Get together with three to six people who are taking Math 121, and who all want to work together for the whole semester.
- Check that everyone is willing to attend a 60 minute group meeting every week.
- Have one person email Professor R Dunwell (dunwellr@rhodes.edu) with the names, email addresses and course section (the section number, or a list time of lectures) of everyone in the group. This should be sent before 5pm on Wednesday, September 8th.

Then what happens?

- Professor Dunwell will reply to you by 5pm Thursday, September 9th, with the name of your group's mentor.
- You will be asked to communicate, as a group, with your mentor to schedule the time for your weekly meetings.
- Your group will start meeting in the week beginning Sunday September 12th.
- The fun begins.

Notes:

1. It may be necessary to join smaller groups together, but this will happen only if it is absolutely necessary and no group will be larger than six students.
2. In the unlikely event of you missing three group meetings you will be asked to leave the group.