

# MATH 131 — Calculus for the Physical and Life Sciences 1

## Course Information for Fall 2008

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Office Hrs: Mon. & Tue. 12:00 – 1:00 pm, Wed. 2:00 – 3:00 pm, Thu. 1:00 - 2:00 pm, and by appt.

Prereq: Pre-calculus or the equivalent.

**Required Text:** *Single Variable Calculus: Concepts and Contexts, 3rd ed.* by James Stewart. A copy of my lecture notes (in a red binder) is on reserve at the Reference Desk in the Science Library. They are for reference only - do not remove them from the library!

**Goals:** This course is designed to help you obtain a deeper understanding of the theoretical foundations and practical applications of calculus. In particular, you will develop analytical thinking skills and the ability to solve applied problems. Ideally, you will learn how to think critically, write coherent solutions to problems and ideally become an articulate and confident mathematician.

**Content:** We will cover Chapters 1–4 and parts of Chapter 5 of the text. Topics include functions, limits, continuity, the derivative, rules for differentiation, applications of the 1st and 2nd derivative, extreme values, optimization, areas and distances, and the definite integral. Knowledge of Appendices A, B and C in the book is assumed of all students.

**Format:** Most classes will be lecture style, however there will be some collaborative group exercises and computer lab projects on other days. Enthusiastic class participation is required of all students.

**Homework:** There will be weekly homework assignments consisting of 20–30 problems from the text. Homework is due at the beginning of class on Fridays and will be graded and returned within one week's time. Homework not handed in on the due day receives a grade of zero. I repeat, no late homework will be accepted; however everyone gets one "late-excuse," which allows the student to hand in the assignment within one week from its original due date for credit. If you will not be in class on a particular Friday, make sure the assignment is given to me sometime on Thursday, or placed under my door Thursday night. The only exception to this rule is if you were sick and have obtained an adequately documented excuse from me or your Class Dean.

**Exams:** Quizzes and exams will be graded and handed back within one week's time. You must be present for all quizzes and exams, as makeups are given only if an adequately documented excuse is first obtained by the student from me or your Class Dean. Quizzes, given in class on Fridays, will consist of approximately two problems, similar to those in the previous week's homework. The semester exams, given on Wednesday evenings from 7:00 - 8:30 pm, consist of 5-8 problems and are meant to test your ability to synthesize and assemble those concepts that you have learned from your homework assignments and reading. The questions will not be like homework problems. They are designed to test your knowledge and thinking skills.

- Quiz dates – Sep. 19, 26; Oct. 3, 17, 24, 31; Nov. 14, 21; Dec. 5

- Semester exam dates – Oct. 8 (no class on Oct. 10); Nov. 5 (no class on Nov. 7)
- Final exam – Dec. 13, 2:30 - 4:30 pm

**Grading:** The total of the weekly homework (from the text), collaborative learning, and computer lab assignments will count towards 15% of the course grade. The in-class quizzes will count towards 15% of the course grade. The two in-class semester exams will each count towards 20% of the course grade. The comprehensive final exam will count towards 30% of your course grade.

**Academic Honesty:** The Department of Math & Computer Science adheres to the College's policy on Academic Honesty. You are required to uphold this policy. Violations will result in a grade of zero for that assignment or exam. Further disciplinary action from the College may result.

### **Tips for Success:**

- *Attend the lectures, actively participate and ask questions*  
I work hard to prepare coherent, structured lectures and will put forth every effort to assist you in learning the material. But this is no use to you if you do not attend class. During certain class periods, we will collectively work through problems together, with the goal of teaching you how to think.
- *Do your homework regularly*  
You will find it impossible to begin your homework the night before it is due. You will need time to think carefully about the questions, what they are asking, and how to figure out the solutions. In office hours, I am notorious for not telling you how to solve a given problem. Instead, I will give hints and ask you questions to lead you in the right direction. You will be required to “sweat through” the material, but I promise that once you adjust to this learning style, you will find it to be an invaluable asset.
- *Work with your peers*  
The best way to learn mathematics is to *do* mathematics. This means mastering the material so that you could explain it to your classmates. A common adage amongst mathematicians is, “You don't really learn a subject until you can teach it.” Mimicking an algorithm is insufficient; a strong student is able to follow and propose arguments as to why a methodology is/is not working.
- *Come to office hours*  
If you do not understand a particular topic, then come see me in office hours as soon as possible. Waiting only makes things worse. I will not come seek you out to give you help. You must take the initiative to ask for it. Office hours work best in groups, so that we can all learn together and from each other's mistakes. The format is simple; I sit while you (and everyone else) works through the problem in question at the blackboard. It's actually fun!
- *Show all of your work*  
“The devil is in the details,” is the common expression. In this class, the details are vital and I will be a stickler in my grading. You'll be required to carefully justify each step, so show all of your work on homework and exams. Without showing all of the details, one will not receive full credit for a correct answer. I am less concerned with your obtaining the correct answer and more concerned with the process by which you obtained your solution.