

# CAPITOL COLLEGE - DEPT. OF COMPUTERS & MATHEMATICS

MA 261 E01 Calculus I  
Fall Semester 2007 TTH 5:30-7:30pm LAU

**Instructor :** William Kallfelz

**Office Hours:** Tuesdays, Thursdays 7:30-8:30pm or by appointment.<sup>1</sup>

**Phone, email, URL:** (301) 405-5841 (office) (301)277-7487 (home)

Note: Email is the best way to get in touch with me.

[wmkallfelz@capitol-college.edu](mailto:wmkallfelz@capitol-college.edu)

[wkallfel@yahoo.com](mailto:wkallfel@yahoo.com)

[wkallfel@umd.edu](mailto:wkallfel@umd.edu) (alternate email: please use only if yahoo is down)

homepage: <http://www.glue.umd.edu/~wkallfel>

(Effective Aug 29th: [MA261](#) course website will be created—just click the link on my homepage, which you'll find under the **Recent Courses Taught** heading, or go directly to:

<http://www.glue.umd.edu/~wkallfel/MA261Fall07/index.html>

## I.) OBJECTIVES AND GOALS OF THIS COURSE:

To obtain grounding in some of the essential concepts and computational techniques in the following areas:

1. Achieving a qualitative and quantitative sense of the behavior of graphs of various functions (polynomial, rational, exponential/logarithmic, simple trigonometric-both hyperbolic and circular, and various linear combinations thereon.)
2. Achieving a qualitative and quantitative understanding of the concept of limit vis-à-vis asymptotes, being able to evaluate the limits to simple cases of functions mentioned above (both in continuous case and in discontinuous cases. ) For the former, being able to rigorously define continuity from the standpoint of the limit concept. For the latter, being able to distinguish essential versus removable singularities. Last of all, being able to evaluate the difference quotient using the concept of limits for simple cases of functions mentioned in 1. above
3. Mastering fundamental techniques of differentiation (power rule, product rule, quotient rule, chain rule, implicit differentiation) to arbitrary (i.e.,  $n$ -th) order.
4. Mastering fundamental techniques of anti-differentiation (or integration) as subsumed by the FTC (Fundamental Theorem of Calculus) and its corollaries including Leibnitz's Rule. Applying such techniques of integration in the case of definite, indefinite, improper, parts, and numerical integrals for cases involving functions listed in 1.
5. Applying 3. and 4. to problems/applications involving (but not limited to) problems in optimization, and in the evaluations of areas, volumes, and centroids.
6. Applying some or all of the techniques listed in 2., 3., 4., to construct precise graphs of simple cases of classes of functions listed in 1.

## II.) COURSE INFORMATION AND POLICIES:

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<sup>1</sup> Location: Puente Library. I am available for appointments Mondays, Fridays

- **Text (required)** Larson, Hostetler, Edwards (LHE 1998) *Calculus* (Alt 6<sup>th</sup> Edn.)
- **Optional Text(s) / URLs**  
I will occasionally cite other texts and URLs in Handouts and Problem Sets 1,2,3 for the interested student. (See **Information Literacy** below)
- **Prerequisite** MA 114 or equivalent
- **Software & Lab Facilities:** There is a panoply of java-based freeware on the internet, as well as applications dealing with MATLAB, Mathematica, etc. I will refer to some of these packages and sites when appropriate, during class and in the class notes I will post on the course website.

- **Academic Integrity:**

*From the Adjunct Faculty Handbook: (§H)*

*“At Capitol College, academic dishonesty consists of:*

- ***Cheating:*** *using or attempting to use unauthorized materials, information, or study aids in any academic exercise.*
  - ***Fabrication:*** *falsification or invention of any information or citation in an academic exercise.*
  - ***Facilitating Academic Dishonesty:*** *helping or attempting to help another to violate any provision of this code.*
  - ***Plagiarism:*** *representing the words or ideas of another as one’s own in an academic exercise.*
- ...Details are outlined in the Student Handbook.”*

Homework I assign for credit will be accompanied by a statement, which you must read and sign and attach as a cover sheet in order to receive a grade for the assignment. This statement will specify explicitly all resources you may consult (e.g. the instructor, text(s), notes, URLs, depending on the nature of the assignment.)

It goes without saying that all work handed in for grading must be your own, but you must go further than this. Avoid situations that could compromise your integrity. For example, do not allow others to copy your work. If inclusion of another person’s writings in your submitted work is appropriate, then proper credit should be given to the author of that writing. I will report any instance of suspected academic dishonesty to the appropriate committees of the school for further investigation and possible sanctions.

- **Writing Requirements**

The ability to communicate ideas using established rules of the English language is an important outcome of everyone’s technical education. In this course, you will be required to complete assignments for which writing is an important component, and attention to the grammar, spelling, and style of writing that you employ will have a significant impact on your grade in such assignments. You may seek help at the tutoring resource center to improve your writing abilities, should you feel that such help is necessary. You will find a writing guidelines posted at the following web address on school website:

<http://www.capitol-college.edu/resources/lib/writingguide/>

- **Incomplete Policy:** College regulation specifies that an incomplete grade may be awarded only if the student has completed almost all the work for a course and has a valid, institution-approved, reason for being unable to complete it. If you are awarded an incomplete grade, it is your responsibility to

complete all work for the course within the first four weeks of the next semester or summer term. After this time, the Registrar automatically converts the incomplete to an F.

- **Information Literacy:** Given the magnitude of information that we are expected to deal with in the performance of our tasks, it is important to learn the proper ways of finding, retrieving, storing, processing and incorporating the right type of information. This course may include assignments that would require the use of on-campus and on-line libraries, the Internet or other sources of publicly available information.
- **Attendance:** Regular attendance in this course, as in any mathematics course, is critical to thorough understanding of each concept and the continuity linking one concept to the next.
- **Quizzes and Tests and Final:** There will be two exams and three problem sets (based on homework problems assigned at each class but not collected). There will be no make-ups for exams.
- **Cell Phones, Pagers and iPods:** Cell phones, and pagers must be turned off when the student enters the classroom. Disruption of class by a cell phone or pager may lead to expulsion from the class. iPods in class will not be tolerated. Students with earphones and iPods will be asked to leave the classroom.

### III.) GRADING<sup>2</sup>:

A.) Two exams (worth 150 pts) = 300 total

B.) Three problem sets (worth 100 points) =300 total

D.) The final exam is worth 200points.

F.) The total possible points a student can earn is 800. Final letter grade is decided on a 12.5% scale as listed below:

<u>Total Points (Pts)</u>	<u>FINAL LETTER GRADE</u>
$700 \leq \text{Pts} \leq 800$	A
$600 \leq \text{Pts} < 700$	B
$500 \leq \text{Pts} < 600$	C
$400 \leq \text{Pts} < 500$	D
Below 400	F

### IV.) IMPORTANT DATES:

August 14-17	Registration for part-time students
August 15-17	Orientation/registration and residence hall check in for new students
August 17	Final day of registration December graduates notify the <a href="#">Office of Registration and Records</a>
August 18	Residence hall check in for returning students
August 20	Classes begin Last day for 100% refund Library opens First tuition installment due Cooperative education work period begins

<sup>2</sup> The final exam is comprehensive. **If your final exam grade > average before final, then the final exam will count 400 pts (50% of your grade). If your final exam grade ≤ average before final, then your final grade will be determined via the procedure above.**

August 27	Electronics, physics/chemistry and computer labs open Tutoring Resource Center opens
August 31	Last day for 75% refund
<b>September 3</b>	<b>Labor Day - college closed</b>
September 4	Last day to <a href="#">add a course</a> Last day to <a href="#">change status to audit</a>
September 10	Last day for 50% refund
September 17	Last day for 25% refund Second tuition installment due
September 24-28	Financial Aid Disbursement Week/Pell Census
<b>September 25</b>	<b>Career Day - no classes</b>
October 16	Final tuition installment due
October 30	Last day to <a href="#">drop a course</a> Registration for spring semester begins for continuing students
<b>November 21</b>	<b>Classes are cancelled - college closes at 5 p.m.</b>
<b>November 22-25</b>	<b>Thanksgiving recess - college closed</b>
November 26	Classes resume
December 7	Classes end Electronics and physics/chemistry labs close Tutoring Resource Center closes All library materials are due Last day for cooperative education work Last day to <a href="#">Withdraw</a>
December 10-14	Final examinations
December 14	Library, computer labs close Residence halls close at 5:00 p.m.
December 19	College closes at 5:00 p.m. for recess
<b>December 20 - January 1</b>	<b>Winter recess - college closed</b>

## **V.) COURSE PLAN/CONTENT**

- **Detailed Lesson Plan**

The lesson plan will follow the timetable below. Time permitting, I may cover optional material further extending and/or specializing the general topic(s) covered in text. Such optional material may appear in your problem sets and exams to give you opportunity to earn bonus points. **In general, the assignments you hand in and the Exams are based on the Exercises in LHE 1998.** Each week, I will assign problems from these exercises, which you're free to ask about/discuss the first 30-45 minutes of class (you need not hand these in, that I assign on a weekly basis.) Where relevant, some of the problems you'll encounter in the Assignments that you hand in may involve some software applications.

**IMPORTANT: I will be in Seattle, WA until Aug 29th. The first three class sessions will be instructed by Dr. Robert Weiler, Director of Mathematics Department. I will email handouts to guide you through the topics.**

Week of	Chapters covered in text	Topics/assignments/exams
1. August 20	1.1-1.4	Review (functions, graphs, elementary analytic geometry)
2. Aug 27 <b>Course website activated Aug 29th</b>	1.4-2.2	Review (cont.) & Introduction of limit concepts <b>Assignment 1 handed out (Thursday)</b>
3. Sept 3	2.3-3.3	Continuity, differentiability, derivative formulae for power forms
4. Sept 10	3.4-4.1	Chain rule, product rule, quotient rule & applications (related rates, extrema)
5. Sept 17	4.2-4.7	Optimization & advanced curve sketching & analysis <b>Assignment 1 due (Thursday)</b>
6. Sept 24	<b>EXAM I Thursday (Topics covered: chptrs.: 1.1-4.7 in weeks 1.-5.), 4.8-4.10</b>	Newtons method & differentials
7. Oct 1	5.1-5.6	Riemann Integral, Fundamental Thm of Calculus, $u$ -substitutions <b>Assignment 2 handed out (Thursday)</b>
8. Oct 8	6.1-6.4 (selections)	Applications I: Area between curves, volumes (shell and disk methods), centroids
9. Oct 15	6.5-7.1	Applications II: Work, Pressure Exponential functions (introduction)
10. Oct 22	7.1-7.6 (selections)	Differentiation/Integration of exponential & logarithmic functions. <b>Assignment 2 due (Thursday)</b>
11. Oct 29	<b>EXAM II-Tuesday Thursday (Topics covered: chptrs.: 4.8-7.7 in weeks 6-10), 7.7-7.8</b>	Applications (growth/decay/logistical growth)
12. Nov 5	8.1-8.4	Simple trigonometric functions and their derivatives and integrals <b>Assignment 3 handed out (Thursday)</b>
13. Nov 12	8.5-8.7	Inverse trigonometric functions and their derivatives and integrals
14. Nov 19	9.1-9.3	Advanced integration techniques (parts, elementary trigonometric substitutions)
15. Nov 26	9.4 (selections), 9.7	Trigonometric substitutions (cont.) & improper integrals
16. Dec 3		Course review <b>Assignment 3 due (Thursday)</b>
17. Dec 10	<b>FINAL EXAM (cumulative, equally weighted) (Tuesday, Dec. 11, in class)</b>	