

# MATH 121: BASIC TECHNIQUES OF APPLIED CALCULUS I

FALL SEMESTER, 2003  
COURSE REFERENCE NUMBER (CRN): 61542  
3.0 Units; Mon. and Wed., 5:00-6:20pm in Room K-213

**INSTRUCTOR: Ken Kuniyuki**

**Email Address:** kkuniyuk@yahoo.com (I check my email on a daily basis.)

**Office Hours:** MTWTh 4:00-4:50pm and 6:30-6:50pm in Room H-212, Office F. You are encouraged to discuss any and all concerns with me.

**Mailbox:** H-207 (or H-212, which leads to the same room). There is a wooden cabinet consisting of cubbyholes labeled alphabetically by last name.

**Voice Mail:**

Office (checked MTWTh): (619) 388-2396

Otherwise: (619) 252-4839

## ACCOMMODATIONS

Students with disabilities or medical concerns who may need academic accommodations should notify their professors immediately. Visit the DSPS Office in Room H-202; it could raise your GPA dramatically!! Phone: (619) 388-2780; for the hearing/speech impaired: (619) 388-2974. Hours: MTThF 7:50am-4:30pm, W 7:50am-7pm.

If you expect to be involved in professional or college activities (e.g., military duty or athletics) that may, for example, hinder your ability to attend class, submit homework, and/or take exams, let me know as soon as possible so that accommodations may be made.

## TEXTS (ONE REQUIRED, TWO OPTIONAL)

- Applied Calculus (3<sup>rd</sup> ed.) by Berresford and Rockett. Houghton-Mifflin, 2004.

This is the standard Math 121-122 textbook at Mesa College, but make sure you don't get the 2<sup>nd</sup> edition, which was used during the summer!

Math 121 essentially covers Chapters 2-5 and Sections 7.1-7.3.

A reserve copy of the textbook may be available at the LRC ("The Library").

Optional but highly recommended:

- The accompanying Student Solutions Manual by Berresford and Rockett. Again, make sure to get the 3<sup>rd</sup> edition version, not the 2<sup>nd</sup>.
- How to Ace Calculus: The Streetwise Guide by Colin Adams, Joel Hass, and Abigail Thompson. This is a cheap, highly readable, fun, informal supplement. Also check the Math 150 section of the bookstore.

## OTHER SOURCES

These paperbacks are much cheaper than textbooks, and they have many worked-out problems.

- Schaum's Outline of Calculus by Mendelson and Ayres; Publisher: McGraw-Hill
- 3,000 Solved Problems in Calculus (Schaum's Solved Problems Series) by Mendelson; Publisher: McGraw-Hill
- REA's Problem Solvers: Calculus, or The Calculus Problem Solver by Weisbecker; Publisher: Research & Education Assn.

You can purchase these books at bookstores or through [www.amazon.com](http://www.amazon.com)  
The LRC (our library) may have old editions.

## PREREQUISITES

MATH 116 (College and Matrix Algebra) with a grade of "C" or better, or equivalent.  
Add codes will not work if prerequisites are not satisfied.

## COURSE DESCRIPTION

### Catalog Description

This is a course designed for students intending to major in business, natural science or social science. It does not fulfill a mathematics requirement for students majoring in mathematics, chemistry, physics or engineering. This course combines the study of algebra, analytic geometry, and calculus using numerical, graphical, and analytical methods to analyze calculus problems encountered in real world applications. Topics include limits, derivatives, and integrals of [involving] algebraic, exponential and logarithmic functions. Also covered are functions of several variables, partial derivatives, and optimization of multivariable functions. Applications of calculus include curve sketching, optimization, and areas under curves. Analytical reading and problem solving are required for success in this course.

## COURSE OBJECTIVES

From the District's Course Outline (I may modify this.)

Upon successful completion of the course the student will be able to:

1. Interpret and evaluate limits of algebraic, exponential and logarithmic functions.
2. Determine the continuity of functions at specific points and in an entire set.
3. Calculate derivatives of algebraic, exponential and logarithmic functions, applying various rules of derivatives.
4. Analyze graphs of functions using calculus techniques.
5. Apply derivatives to solving constrain[ed] and unconstrain[ed] optimization problems.
6. Apply logarithms and exponential[s] to solve growth and decay models.
7. Apply derivatives to business, natural and social science related problems.
8. Calculate antiderivatives of functions involving algebraic, exponential, or [logarithmic] terms.
9. Calculate [antiderivatives] using the technique of substitution.
10. Compute definite integrals by applying the Fundamental Theorem of Calculus, and apply definite integrals in solving for the area in between curves.
11. Evaluate functions of several variables and calculate their partial derivatives.
12. Apply calculus techniques in optimizing functions of several variables.

## ADDITIONAL HELP

**Your fellow students!**

**Students have found tutoring services to be a critical resource!**

• **Tutoring Center** (Room K-211). Walk-in tutoring for Math and Science.  
Tentative Hours: MTWTh 8:30am-6:30pm, F 8am-2pm. Phone: (619) 388-2898.  
You will need to sign up for the 0-unit Credit/No Credit "course" Math 44 (CRN: 81730). No extra work is required.

• **STAR Tutoring** (Building I-300, Room 101). One-on-one weekly tutoring for eligible students (low income, first generation college, or disabled).  
Hours: MTWThF 8am-5pm. Phone: (619) 388-2706.

• **Center for Independent Learning** (Learning Resource Center, LRC - "The Library"; 4<sup>th</sup> floor). Videotapes may be available. Library Hours: MTWTh 7am-9pm, F 7am-5pm, Sat. 8am-3pm. Phone: (619) 388-2769.

**Web sites of interest:**

(The instructor bears no responsibility for these sites.)

- [www.drmath.com/dr.math](http://www.drmath.com/dr.math)  
(Frequently asked questions and extensions...)
- [www.cut-the-knot.com](http://www.cut-the-knot.com)  
(A wonderful collection of games, puzzles, and other neat stuff!)
- [www.math.hmc.edu/funfacts](http://www.math.hmc.edu/funfacts)  
(Interesting topics in a variety of mathematical fields!)

## DEADLINES (SEE THE “VERY TENTATIVE SCHEDULE”)

Dropping without a "W"; add codes (*)	Fri.	Sept. 12	Week 2
Refund eligibility for dropped classes	Mon.	Sept. 15	Week 3
Credit / No Credit petition	Thurs.	Oct. 2	Week 5
Withdrawal deadline (**)	Fri.	Nov. 7	Week 10
Grades available ( <a href="http://studentweb.sdccd.net">http://studentweb.sdccd.net</a> )	Mon.	Jan. 12	

(\*) Tuition and fees must be paid within five days of adding a course, or by Sept. 12, whichever comes first.

(\*\*) If you do not withdraw from the class by this deadline, I must give you a standard A-F grade.

## GRADES / EXAMS

**Cheating is, of course, forbidden.** Possible penalties include assigned scores of "0," a course grade of "F," and action by the school dean. Refer to Policy 3100 in the Mesa College catalog. Collaboration outside of class is encouraged, but copying is forbidden, and any attempts to compromise exam security will not be tolerated.

**Bring a scientific calculator to all exams on which calculators are allowed. Graphing calculators may be forbidden or their use curtailed; grade reductions may result from their use.**

**Do not expect to be able to make up exams.** Even if the instructor allows a student to take a makeup exam, there are no guarantees; for example, the exam may be heavily penalized or not graded or returned at all. In any event, a student must inform the instructor as soon as possible if accommodations need to be made.

**Points may be deducted for messy work, lateness, failure to adhere to “good form and procedure” as presented in class, and the like!**

**Your course score will be out of 750 points (750 points = “100%”), divided as follows:**

**QUIZZES: 500 points (which is about 67% of 750 points)**  
**-- 5 quizzes given, each worth 100 points**

QUIZ	SECTIONS COVERED
Quiz 1	2.1 / 2.2 / 2.3
Quiz 2	2.4 / 2.5 / 2.6 / 2.7
Quiz 3	3.1 / 3.2 / 3.3 / 3.6
Quiz 4	4.3 / 4.4 / 5.1 / 5.2
Quiz 5	5.3 / 5.4 / 5.6

The quizzes are “closed book” and “closed notes,” but a scientific calculator may be allowed.

**HOMEWORK (“HW”): 60 points (8%)**

**-- 10 points for each of 6 submissions**

<b>HW</b>	<b>SECTIONS COVERED</b>
<b>HW 1</b>	<b>2.1 / 2.2 / 2.3</b>
<b>HW 2</b>	<b>2.4 / 2.5 / 2.6 / 2.7</b>
<b>HW 3</b>	<b>3.1 / 3.2 / 3.3 / 3.6</b>
<b>HW 4</b>	<b>4.3 / 4.4 / 5.1 / 5.2</b>
<b>HW 5</b>	<b>5.3 / 5.4 / 5.6</b>
<b>HW 6</b>	<b>7.1 / 7.2 / 7.3</b> <b>(Due at the Final.)</b> <b>(You may want to photocopy</b> <b>this for Math 122.)</b>

Although you are strongly encouraged to do problems as soon as you can, homework will only be **collected on the day of the corresponding exam**, unless the due date is explicitly postponed.

**Make sure you clearly separate sections on your homework!**

**Failure to do homework in a timely manner can wreck your grade in this class - in terms of both points and exam preparation!**

**Remember to write your name on your homework!**

Answers to odd-numbered problems are in the back of the textbook. Many “worked-out” solutions are in the Student Solutions Manual. Use the Student Solutions Manual wisely. Points may be deducted for copying.

On your homework, **show work where appropriate**. Points may be deducted from homework assignments that are turned in late, that are incomplete or illegible or messy, that are plagiarized, or that have insufficient work.

**CLASS PARTICIPATION: 40 points (about 5%)**

This involves class attendance, disruptive behavior, and/or participation in office hours and in-class activities and exercises. Class participation may be a key factor in determining grade “borderline” cases.

**FINAL: 150 points (20%)**

This is an essentially **comprehensive** exam that will be given **during the last class session, on Wed., Dec. 17, in our regular room.**

**Sections 7.1, 7.2, and especially 7.3 will be well-represented on the Final compared to other sections.** I may use True/False, multiple choice, short-answer questions, and/or long-answer questions, etc. to test you on the other sections.

**You will be allowed to use one 8 1/2" by 11" sheet of notes.** You may use both sides of the sheet. Students with vision impairments should speak with me. The sheet must be two-dimensional - no “pull-outs” or other tricks! Typing and photocopying are fine, though writing by hand is recommended. You should stress organization over clutter. Work on this throughout the semester.

**Bring a scientific calculator in case one is allowed on all or part of the Final.**

**The following are guarantees:**

<u>Course score out of 750</u>	<u>Grade guarantee</u>
At least 675 (90%)	A
At least 600 (80%)	B or better
At least 525 (70%)	C or better
At least 450 (60%)	D or better

In other words, I do not reverse curve. The grade cutoffs may be lowered. Percents may not be rounded up! Class participation could be critical here.

The course may be taken on a Credit / No Credit basis, but check your program requirements, first. The petition deadline is Thurs., Oct. 2 (Week 5).

**COME TO CLASS WITH:**

- The appropriate textbook(s), at least on days when I will answer your HW questions.
- **A scientific (not graphing) calculator - you will need one for the course.**  
**Graphing calculators may be forbidden on exams.**
- Some paper and a pencil or pen: for notetaking and in-class exercises
- Homework (on exam dates; keep yourself updated on changes to our schedule!!)

**Ø KIDS**

Children are forbidden in the classroom. Check with the Child Development Center in Building R. Phone: (619) 388-2812.

**ATTENDANCE**

Students who are absent for the equivalent of two or more class meetings or roll calls may be dropped from the course; refer to the Mesa College catalog. Students who miss the first day of class may also be dropped. **It is VERY important for you to be in class throughout the entirety of the scheduled time. I consider tardiness and premature departures as forms of absences, particularly if habitual; many students are distracted by such behavior. Your attendance and tardiness record may also affect your grade.** You must inform me of medical priorities and the like as soon as possible.

## **CLASSROOM BEHAVIOR AND STUDENT CODE OF CONDUCT:**

Students are expected to respect and obey standards of student conduct while in class and on the campus. The student Code of Conduct, disciplinary procedure, and student due process (Policy 3100, 3100.1 and 3100.2) can be found in the current college catalog in the section Academic Information and Regulations, and at the office of the Dean of Student Affairs (H-500). Charges of misconduct and disciplinary sanctions may be imposed upon students who violate these standards of conduct or provisions of college regulations.

**Disruptive behavior will not be tolerated; disruptive students may be removed from the class and are especially likely to be dropped from the course. Disruptive behavior includes, among other things, inappropriate talking, eating or drinking in class, tardiness, and premature departures. Your grade may be affected. Discuss personal scheduling issues with the instructor. Refer to Policy 3100 in the Mesa College catalog.**

**REMEMBER TO TURN OFF YOUR CELL PHONE!!!**

## **RESPONSIBILITY TO ADD, DROP, OR WITHDRAW**

**It is the student's responsibility to add, drop, or withdraw from class before the deadlines stated in the class schedule.** Petitions to add, drop, or withdraw after the deadline will not be approved without proof of circumstances beyond the student's control which made him/her unable to meet the deadline. Lack of money to pay fees is not considered an extenuating circumstance. Students anticipating difficulty in paying fees before the add deadline should check with the Financial Aid Office about sources of funds or other alternatives for which they may be eligible.

If you decide to withdraw from this course, you are reminded to do so by the 10<sup>th</sup> week of instruction. If you fail to withdraw by that date and you stop coming to class, a final grade must be assigned to you. Those attending after the withdrawal deadline will be given a letter grade.

Please discuss your plans to withdraw from class with your instructors. They may have other options for you that may allow you to continue in class.

## **INSTRUCTOR ABSENCE (DISTRICT POLICY)**

If neither the instructor nor a substitute appears at the beginning of the scheduled class time, students shall wait 15 minutes; if neither the instructor nor a substitute appears within those 15 minutes, students may leave the classroom.

## **NOTES / CLASS CONTACTS**

# VERY TENTATIVE SCHEDULE (VERSION 1)

Rev. = Review

HW = Homework (and other) questions. I may take questions for a few minutes before a quiz.  
 (See me in my office hours or email me throughout the semester whenever you have questions.)

Week (Deadlines)	MONDAY	WEDNESDAY
<b>1</b>	9/1 <b>HOLIDAY</b>	9/3 Hello / 2.1
<b>2</b> Avoid W; Add codes (Fri. 9/12)	9/8 2.1	9/10 2.2
<b>3</b> Refund deadline (Mon. 9/15)	9/15 2.2 / 2.3	9/17 2.3 / Rev. / HW
<b>4</b>	9/22 <b>QUIZ 1</b>	9/24 2.4
<b>5</b> C/NC petition (Thurs. 10/2)	9/29 2.5	10/1 2.6 / 2.7
<b>6</b>	10/6 Rev. / 3.1 / HW	10/8 <b>QUIZ 2</b>
<b>7</b>	10/13 3.1 / 3.2	10/15 3.2
<b>8</b>	10/20 3.3	10/22 3.3 / 3.6
<b>9</b>	10/27 3.6 / Rev.	10/29 (4.1) / (4.2) / HW
<b>10</b> W deadline (Fri. 11/7)	11/3 <b>QUIZ 3</b>	11/5 4.3 / 4.4
<b>11</b> Veteran's Day (Mon. 11/10)	11/10 <b>HOLIDAY</b>	11/12 4.4 / 5.1
<b>12</b>	11/17 5.2 / Rev.	11/19 5.3 / HW
<b>13</b> Thanksgiving recess (Thurs./Fri. 11/27-28)	11/24 <b>QUIZ 4</b>	11/26 5.3 / 5.4
<b>14</b>	12/1 5.4 / 5.6	12/3 5.6 / Rev. / HW
<b>15</b>	12/8 <b>QUIZ 5</b>	12/10 7.1 / 7.2
<b>16</b>	12/15 7.2 / 7.3	12/17 <b>FINAL</b>

Grades available: Mon., Jan. 12 (<http://studentweb.sdccd.net>)