

# MATH 150: CALCULUS WITH ANALYTIC GEOMETRY I

SPRING SEMESTER, 2012; SYLLABUS DATE: 1/10/12  
COURSE REFERENCE NUMBER (CRN): 90245  
5.0 Units; Mon. and Wed., 6:00-8:25pm in Room H-204 (Mesa)

**INSTRUCTOR: Ken Kuniyuki**

**Email Address:** kkuniyuk@yahoo.com; there is no “i” before the “@.”  
My official address is: kkuniyuk@sdccd.edu (esp. for things like applications).

- I usually check my email at least twice a day and my voice mail MTWTh.
- When asking about HW, please let me know what you are thinking about the problem, so I know where to start addressing your question. Please go beyond: “How do you do this problem?” If you do that, I may just give a hint!

**Office Voice Mail:** (619) 388-2396, checked MTWTh.  
Warning: Long messages might get cut off or deleted from the system!

**Office Hours:** M 4:50-5:50pm, T 6-7pm, W 3:50-5:50pm, Th 6-7pm (see poster online)  
in Room H-212, Office F. You are encouraged to discuss any concerns with me.

**Mailbox:** H-207 (or H-212, which leads to the same room). There is a wooden cabinet consisting of cubbyholes; mine still has my name labels. Technically, K-108B is my “official” mailroom, but it is locked, and students leave messages at K-203.

**MY WEB SITE AT <http://www.kkuniyuk.com> (or google my name)**

Ready access to the Internet and a printer will be assumed (and will prove very helpful), but the maximum number of course points can be earned without them. Computers and printers are available at the LRC (the Library), especially on the 4<sup>th</sup> floor. Let me know if you do not have access, or if you encounter errors. We can make hard (i.e., printed) copies of some items.

I expect to post homework assignments and answers (provided in class and online); **class notes; exam outlines; old and current exams and solutions;** class announcements; **tentative schedules; tips on test taking and reducing test anxiety;** campus events; and extra links, notes, info, and resources for interested students.

**I will try to help you form study groups.**

**THERE IS NO REQUIRED TEXTBOOK. MY NOTES ARE ONLINE. HW PROVIDED.**

**NOTES FOR EARLY CHAPTERS:**

- These are in pdf form on my web site, and you may print them yourself in black-and-white or color, as you wish.

The bookstore has **black-and-white**, shrink-wrapped, three-hole punched copies of these early chapter notes in two different formats:

- Large-Print Version (blue cover)
- Small-Print Version (green cover; two pages per side; cheaper)

**THE REMAINING NOTES ARE ONLINE.**

My in-class lectures will be based on the **notes provided online**. Many people print the notes before class – for the typed notes, preferably two-pages-to-a-side, double-sided (sometimes, something like 110% scaling for larger print can help; other times, text gets cut off, though).

**Homework (HW)** assignments and answers will be provided in class, and they will also be posted online.

**OPTIONAL TEXTBOOKS (SEE MY WEB SITE)**

- Calculus: The Classic Edition (5<sup>th</sup> ed.) by Swokowski; Publisher: Brooks/Cole. ISBN: 1-111-62711-8 (bookstore version), or 0-534-38212-6.

This is the standard Math 150-151-252 calculus textbook at **Mesa** College (some instructors use Tan). Math 150 essentially covers Chapters 1-8. **ON RESERVE AT THE LIBRARY**. My notes are organized like this book, starting with Ch.3.

- Student's Solutions Manual for the above.

Cheap, readable paperback guides:

- How to Ace Calculus: The Streetwise Guide (AT THE BOOKSTORE) by Colin Adams, Joel Hass, and Abigail Thompson. Publisher: Freeman, 1998. This is a cheap, highly readable, fun, informal supplement. ISBN: 0-716-73160-6. How to Ace the Rest of Calculus is the sequel.
- Calculus for Dummies by Mark Ryan. Publisher: For Dummies, 2003. This is a concise overview of both Math 150 and 151.
- The Complete Idiot's Guide to Calculus by W. Michael Kelly. Publisher: Alpha, 2002.

You are encouraged to look at other calculus textbooks, such as:

- Calculus with Analytic Geometry by Larson, Hostetler, Edwards;  
Publisher: Houghton Mifflin. Easy-to-read, but sometimes imprecise.  
OLD 6<sup>TH</sup> EDITION ON RESERVE AT THE LIBRARY.
- Calculus by Tan;  
Publisher: Brooks Cole. Some Mesa instructors are using this.
- Calculus by Stewart;  
Publisher: Wadsworth. Opinions of this book vary. Many colleges use it.

These paperbacks are much cheaper than textbooks, and they have many **worked-out problems**. “Advanced Calculus,” “Differential Equations,” “Vector Calculus/Analysis,” “Discrete Mathematics” and “Linear Algebra” books in the first and third series listed are also available for your later math classes.

- Schaum’s Outline of Calculus by Mendelson and Ayres;  
Publisher: McGraw-Hill. It may have errors, and it omits Vector Calculus.
- 3,000 Solved Problems in Calculus (Schaum's Solved Problems Series)  
by Mendelson; Publisher: McGraw-Hill. Also available: Linear Algebra.
- 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) or [ebay.com](http://ebay.com), say. My web site has Amazon links. The LRC (our library) may have old editions.

## PREREQUISITE

MATH 141 (Precalculus) with a grade of "C" or better, or equivalent.

## COURSE DESCRIPTION (FROM COLLEGE CATALOG)

### Catalog Description

This course is a primary introduction to university level calculus. The topics of study include analytic geometry, limits, differentiation and integration of algebraic and transcendental functions. Emphasis is placed on calculus applications. Analytical reading and problem solving are required for success in this course. This course is intended for the transfer student planning to major in mathematics, computer science, physics, chemistry, engineering, or economics. This course meets general education, CSU, IGETC, and TAG requirements.

## STUDENT LEARNING OUTCOMES

Student Learning Outcomes for the math dept.:

“Students who complete the Mathematics program will be able to.....”

- 1) Apply appropriate mathematical definitions, properties, and techniques in a variety of problem solving situations and recognize an appropriate solution as opposed to an unreasonable or extraneous one.
- 2) Demonstrate knowledge of the interrelatedness of the concepts within a particular course and/or among different courses.
- 3) Demonstrate the ability to communicate mathematical reasoning in the context of solving a problem with clarity and detail.
- 4) Choose and apply appropriate mathematical tools to various problems.

Student Learning Objectives from the District’s Course Outline (I may modify this):

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

1. Evaluate various types of limits graphically, numerically, and algebraically, and analyze properties of functions applying limits including one-sided, two-sided, finite and infinite limits.
2. Develop a rigorous  $\epsilon - \delta$  limit proof for simple polynomials.
3. Recognize and evaluate limits using the common limit theorems and properties.
4. Analyze the behavior of algebraic and transcendental functions by applying common continuity theorems, and investigate the continuity of such functions at a point, on an open or closed interval.
5. Calculate the derivative of a function using the limit definition.
6. Calculate the slope and the equation of the tangent line of a function at a given point.
7. Calculate derivatives using common differentiation theorems.
8. Calculate the derivative of a function implicitly.
9. Solve applications using related rates of change.
10. Apply differentials to make linear approximations and analyze propagated errors.
11. Apply derivatives to graph functions by calculating the critical points, the points of non-differentiability, the points of inflections, the vertical tangents, cusps or corners, and the extrema of a function.
12. Calculate where a function is increasing, or decreasing, concave up or concave down by applying its first and second derivatives respectively, and apply the First and Second Derivative Tests to calculate and identify the function's relative extrema.
13. Solve optimization problems using differentiation techniques.
14. Recognize and apply Rolle's Theorem and the Mean-Value Theorem where appropriate.
15. Apply Newton's method to find roots of functions.
16. Analyze motion of a particle along a straight line.
17. Calculate the anti-derivative of a wide class of functions, using substitution techniques when appropriate.
18. Apply appropriate approximation techniques to find areas under a curve using summation notation.
19. Calculate [Define] the definite integral using [the limit of a Riemann sum and] the Fundamental Theorem of Calculus and apply the Fundamental Theorem of Calculus to investigate a broad class of functions.
20. Apply integration in a variety of application problems, including areas between curves, arc lengths of a single variable function, volumes

## ACCOMMODATIONS; DSPS

Students with disabilities or medical concerns who may need academic accommodations should notify their professors immediately. Check out the DSPS web site at <http://www.sdmesa.edu/dsps> ... or visit the DSPS Office in I3-101, on the first floor of the I-300 building (it is expected to move to the Student Services Building in 2012 when it is completed); it could raise your GPA dramatically!! Phone: (619) 388-2780; for the hearing/speech impaired: (619) 388-2974. Hours: Check their web site and their office; tentatively, M-Th 8-4:30 and F 8-12.

DSPS students should give me test proctoring forms **at least one week** before they take the corresponding exams. I may need to take them home or fill them out in my office.

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.

## ADDITIONAL HELP

**Your fellow students!** My web site may provide some help.

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

- **Math and Science Center** (Room I-207(M)). Walk-in tutoring. Hours to be determined. Hours from Fall 2011 were: MTWTh 10am-6pm. Phone: (619) 388-2898. <http://www.sdmesa.edu/math-science-center>

- **STAR Tutoring** (I3-201, on the second floor of the I-300 building; this may change). One-on-one weekly tutoring for eligible students (low income, first generation college, or disabled). Tentative Hours: MTWTh 8am-5pm and F 8am-12 noon. Phone: (619) 388-2706. <http://www.sdmesa.edu/star>

**Center for Independent Learning** (Learning Resource Center, LRC - "The Library"; 4<sup>th</sup> floor). Videotapes and DVDs may be available. Library Hours: MTWTh 7am-10pm, F 7am-5pm. Closed: Sat., Sun., holidays. Phone: (619) 388-2769. <http://www.sdmesa.edu/cil>. Library: (619) 388-2695.

**Web sites!** My web site has links that may prove helpful.

## DEADLINES (SEE THE "VERY TENTATIVE SCHEDULE")

Dropping without a "W"; add codes (*)	Fri.	Feb. 3	Week 2
Refund eligibility for dropped classes	Mon.	Feb. 6	Week 3
Pass / No Pass petition	Mon.	Feb. 27	Week 6
Withdrawal deadline (**)	Fri.	Mar. 30	Week 10

Grades available online: Starting **Tues., May 29, 2012**; (<http://studentweb.sdccd.edu>)

(\*) Tuition and fees must be paid within two (?) days of adding a course, or by Feb. 3, whichever comes first.

(\*\*) If you do not withdraw from the class by this deadline, I must give you an evaluative grade (e.g., A-F, Pass / No Pass).

## GRADES / EXAMS

Bring a **scientific calculator** to all exams on which calculators are allowed.

**Graphing calculators will be forbidden;** grade reductions may result from their use. (See **COME TO CLASS WITH / CALCULATOR INFO.**)

**There are no guarantees regarding makeup exams.** Even if one is allowed, the time allowed to take the exam might be reduced, the exam may be difficult, and the exam might not be returned. If you end up being a “borderline” grade case, makeups may hurt. Testing conditions may be very poor. A student must inform the instructor **as soon as possible** if accommodations need to be made. **Promptly inform the instructor if there is a problem taking an exam; do not expect do-overs of exams to be allowed.**

**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 1000 points (1000 points = "100%"), divided as follows:**

**QUIZZES: 600 points (which is 60% of 1000 points)**

**-- 6 quizzes given, each worth 100 points**

QUIZ	IN MY NOTES, SWOKOWSKI 5 <sup>ed</sup>	IN THOMAS (OLD TEXT)
Quiz 1	Ch.1 and Ch.2	Ch.1 and 2.1-2.6
Quiz 2	Ch.3	Part of 2.1, 2.7, Ch.3
Quiz 3	Ch.4	4.1-4.7
Quiz 4	Ch.5	4.8, Ch.5
Quiz 5	Ch.6	5.6 (part), 6.1-6.3, 6.5
Quiz 6	Ch.7	7.1-7.6
(Final)	All; Ch.8 also fair	7.7 and 7.8 are also fair

The quizzes are “closed book” and “closed notes,” but a **scientific** calculator may be allowed. (See **COME TO CLASS WITH / CALCULATOR INFO.**)

**HOMEWORK (“HW”): 90 points (9%)**

**-- 15 points for each of 6 submissions, plus 10-point extra credit assignment**

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

**Turn in HW on time. Expect late HW to be penalized;** the last HW must be turned in on time. Expect late HW to lose about two points for being one session late, four points for two sessions, and all points after that.

**Make sure you clearly separate sections on your homework! Write your first name, last name, and “Math 150” on either a title page or on the upper right corner of the first page.** Contact me if you want to encode your name for privacy purposes.

**Do not turn in a thick, bulky binder.** I collect many HWs, and the HW might not be returned to you for a while.

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.

**The HW is meant to help you learn and study for exams.** For grading purposes, it will be scanned for completeness and overall integrity.

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

### **CLASS PARTICIPATION and ATTENDANCE: 60 points (6%)**

This involves class attendance and promptness, disruptive behavior, and/or participation in office hours (and other forms of communication) and in-class activities and exercises. **Inform me of any reasons for any absences.**

The final grade in this class will be affected by active participation, including attendance, as follows: **Students who engage in idle talking and other disruptive behaviors can lose up to 15 points here. Everyone else will get the full 60 points,** but this is a reminder that I use class participation as **a key factor in determining grade “borderline” cases. Many students have their grades influenced by their participation records. Good attendance can be rewarded.**

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 reasons for absences (including medical priorities and the like) as soon as possible.**

Students who miss the first two weeks of class will be dropped.

### **FINAL: 250 points (25%)**

This is an essentially **comprehensive** two-part exam that will be given **during the last class session, on Wed., May 16, in our regular room.**

**You will be allowed to use one 8 1/2" by 11" sheet of notes on part of the Final; no notes will be allowed on the other part of the Final (this other part may test you on derivatives, integrals, trig and hyperbolic identities and formulas, and inverse trig functions; see the old Final online).** 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. **An outline of topics is available on my web site; this is also a “Day 1” handout.**

**Bring a scientific calculator in case one is allowed for part of the Final.** (See COME TO CLASS WITH / CALCULATOR INFO.)

**The following are guarantees:**

<u>Course score out of 1000</u>	<u>Grade guarantee</u>
At least 900 (90%)	A
At least 800 (80%)	B or better
At least 700 (70%)	C or better
At least 600 (60%)	D or better

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

The course may be taken on a Pass / No Pass basis, but check your program requirements, first. The petition deadline is Mon., Feb. 27 (Week 6).

An “Incomplete” may be given under special circumstances, provided that the student is otherwise passing the course.

**ZERO TOLERANCE FOR CHEATING!!**

- **I have given ‘0’s on tests due to cheating – it can devastate your grade and your ability to enroll as a student!**
- **Cheating is easier to detect than students think!**
- Possible penalties include assigned scores of “0” 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.

**ZERO TOLERANCE FOR IDLE TALKING AND OTHER DISRUPTIONS!!**

- Students can **lose up to 15 class participation points** in their total course score. Deductions may be determined at the end of the semester.
- ‘Borderline’ grade cases **might not be moved up.**
- **Quick**, appropriate assistance to a neighbor is permitted, **BUT MAKE SURE IT’S QUICK!!**
- Many students are distracted by **WHISPERING!** The holes in the ceiling carry noise very effectively.
- **REMEMBER TO TURN OFF YOUR CELL PHONE!!!**

## **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.**

## **COME TO CLASS WITH / CALCULATOR INFO:**

- You may want to print out the course notes either before or after a given lecture. (Early chapters are available at the campus bookstore.) Pdf files can be printed in various ways, including two-pages-to-a-side, double-sided (sometimes, something like 110% scaling for larger print can help; other times, text gets cut off, though).
- Copies of homework assignments and answers (provided in class and online)
- You may want to print out the review notes before an exam.
- **A scientific (not graphing) calculator - you will need one for the course. Graphing calculators will be forbidden on exams.**

Some sections at City, Mesa, and Miramar (and at Cuyamaca and Grossmont) are more graphing calculator-based; check the online schedule.

Many modern scientific calculator models operate like graphing calculators as far as WYSIWYG (What You See Is What You Get) entry goes. For example, the Sharp EL733A is a good business calculator; the HP 30S has a large display; and the TI-30X IIS (which I have and which I can help you with) can also be good, though it relies on menus.

- Some paper and a pencil or pen: for note taking and in-class exercises
- Homework  
We will discuss the homework during part of the session preceding the exam.  
The homework is due on exam dates; keep checking our schedule online.

## **Ø KIDS IN THE CLASSROOM**

Children are forbidden in the classroom. Check with the Child Development Center in Building R. Phone: (619) 388-2812. Hours: MTWTh 7:30am-5:00pm, F 7:30am-2:00pm. Web site: <http://www.sdmesa.edu/cdc>

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

**It is the student's responsibility to drop all classes in which he/she is no longer attending. Students who remain enrolled in a class beyond the published withdrawal deadline, as stated in the class schedule, will receive an evaluative letter grade in this class. If you decide to withdraw from this course, you are reminded to do so by Fri., Mar. 30. It is the instructor's discretion to withdraw a student after the add/drop deadline (Fri., Feb. 3) due to excessive absences (four or more in this class). Keep me informed of your status if you miss several roll calls in a row!**

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. **Expect "late" adds, drops, and withdrawals to no longer be accepted.**

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 20 minutes; if neither the instructor nor a substitute appears within those 20 minutes, students may leave the classroom.

## **NOTES / CLASS CONTACTS (SEE MY WEB SITE, ALSO)**

# VERY TENTATIVE SCHEDULE (VERSION 1)

## SECTIONS REFER TO MY NOTES

(May be changed arbitrarily; keep checking my web site!)

HW = Homework (and other) questions.

(See me in my office hours, email me, or maybe call me whenever you have questions.)

Week (Holidays / Deadlines)	MONDAY	WEDNESDAY
<b>1</b>	1/23 (Day 1) Hello / Ch.1 (you review) / 2.1	1/25 (Day 2) 2.2 / start 2.3
<b>2</b> Avoid W; Add codes (Fri., 2/3)	1/30 (Day 3) finish 2.3 / 2.4	2/1 (Day 4) 2.5 / 2.6 / 2.7
<b>3</b> Refund deadline (Mon., 2/6)	2/6 (Day 5) 2.8	2/8 (Day 6) 3.1 / HW
<b>4</b> Holiday (Fri., 2/17 to Mon., 2/20)	2/13 (Day 7) <b>QUIZ CHS.1,2</b> / start 3.2	2/15 (Day 8) finish 3.2 / 3.3
<b>5</b> Holiday (Fri., 2/17 to Mon., 2/20)	2/20 <b>NO CLASS</b>	2/22 (Day 9) 3.4 / 3.5
<b>6</b> Pass / No Pass petition (Mon., 2/27)	2/27 (Day 10) 3.6 / 3.7	2/29 (Day 11) 3.8
<b>7</b>	3/5 (Day 12) start 4.1 / HW	3/7 (Day 13) <b>QUIZ CH.3</b> / fin 4.1
<b>8</b>	3/12 (Day 14) 4.2 / 4.3	3/14 (Day 15) 4.4 / 4.5
<b>9</b>	3/19 (Day 16) 4.6 / 4.7	3/21 (Day 17) 4.8 / start 5.1
<b>10</b> W deadline (Fri., 3/30)	3/26 (Day 18) finish 5.1 / HW	3/28 (Day 19) <b>QUIZ CH.4</b> /start 5.2
<b>(11 if counted)</b> <b>No classes this week!</b>	4/2 <b>NO CLASS</b>	4/4 <b>NO CLASS</b>
<b>11 (or 12)</b>	4/9 (Day 20) fin 5.2 / 5.3 and 5.4	4/11 (Day 21) 5.5 / 5.6
<b>12 (or 13)</b>	4/16 (Day 22) 5.7 / 6.1	4/18 (Day 23) start 6.2 / HW
<b>13 (or 14)</b>	4/23 (Day 24) <b>QUIZ CH.5</b> / fin 6.2	4/25 (Day 25) 6.3 / 6.4 / start 6.5
<b>14 (or 15)</b>	4/30 (Day 26) finish 6.5 / 7.1 / start 7.2 / HW	5/2 (Day 27) <b>QUIZ CH.6</b> / finish 7.2 / start 7.3
<b>15 (or 16)</b>	5/7 (Day 28) finish 7.3 / 7.4 / 7.5	5/9 (Day 29) 8.1 / 8.2 / HW
<b>16 (or 17)</b> Semester ends Sat., 5/19	5/14 (Day 30) <b>QUIZ CH.7</b> / 8.3 / HW	5/16 (Day 31) <b>FINAL</b>

Grades available online: Starting **Tues., May 29, 2012**; (<http://studentweb.sdccd.edu>)