

MATH 252: CALCULUS WITH ANALYTIC GEOMETRY III

FALL SEMESTER, 2008; SYLLABUS DATE: 08/26/08

COURSE REFERENCE NUMBER (CRN): 44731

4.0 Units; Tues. and Thurs., 7:15-9:20pm in Room K-213 (Mesa)

INSTRUCTOR: Ken Kuniyuki

Email Address: kkuniyuk@yahoo.com (checked daily); there is no "i" before the "@".
If that address doesn't work, try kkuniyuk@sdccd.edu (my official address).

Office Hours: M 4:50-5:50pm, T 6:05-7:05pm, W 3:50-5:50pm, Th 6:05-7:05pm
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.

Voice Mail: Office (checked MTWTh): (619) 388-2396. Otherwise: (619) 252-4839.

MY WEB SITE AT <http://www.kkuniyuk.com>

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 4th 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; class notes; review notes (bring to class!); 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.

TEXTS (SEE MY WEB SITE)

- Calculus: The Classic Edition (5th ed.) by Swokowski; Publisher: Brooks/Cole.
This has been the standard Math 150-151-252 calculus textbook at Mesa College.
Math 252 essentially covers Chapters 14-18. ON RESERVE AT THE LIBRARY.

Optional but highly recommended (the bookstore has the first two; www.amazon.com has the others):

- The accompanying Student's Solutions Manual, Volume 2 (covers Chapters 11-19) by Cole and Rockswold. (Volume 1 covers Chapters 1-11.)
- How to Ace the Rest of Calculus: The Streetwise Guide by Colin Adams, Joel Hass, and Abigail Thompson. Publisher: Freeman, 2001. This is a cheap, highly readable, fun, informal supplement. Its Math 150 prequel is How to Ace Calculus.

- Calculus for Dummies by Mark Ryan. Publisher: For Dummies, 2003. This is a concise review of 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.
6th edition ON RESERVE AT THE LIBRARY.
- Calculus: Early Transcendentals by Stewart;
Publisher: Wadsworth. Used at UCSD (?), but opinions of this book vary.
I believe the non-Early Transcendentals version is used at SDSU.
- Calculus and Analytic Geometry by Thomas/Finney;
Publisher: Addison-Wesley.

These paperbacks are much cheaper than textbooks, and they have many worked-out problems. "Differential Equations," "Discrete Mathematics," and "Linear Algebra" books are also available for your later math classes.

- Schaum's Outline of Calculus by Mendelson and Ayres;
may have errors; omits Vector Calculus;
Publisher: McGraw-Hill. May help: Advanced Calculus, Vector Analysis.
- 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.
May help: Advanced Calculus. Vector Analysis may not be so good.

You can purchase these books at bookstores or through www.amazon.com
My web site has Amazon links. The LRC (our library) may have old editions.

COURSE DESCRIPTION (IN CATALOG)

The content of this course includes the algebra and geometry of 2 and 3 dimensional Euclidean vectors, limits, continuity, partial differentiation, extremes of vector-valued and multivariable functions, higher order derivatives, the chain rule, Lagrange's theorem, multiple integrals, integrals over paths and surfaces, and integral theorems of vector analysis. This course is intended as a general introduction to the theory and applications of multivariable calculus. It is essential for most upper division courses in mathematics and forms part of the foundation for engineering and physics. It is intended for the transfer student planning to major in mathematics, physics, engineering, computer science, physical chemistry, operational research, or economics. (FT). UC Transfer Course List. Associate Degree Credit & transfer to CSU and/or private colleges and universities. CAN MATH 22 = MATH 252 (City, Mesa, Miramar) CAN MATH SEQ C = MATH 252 + MATH 150 + MATH 151 (City, Mesa, Miramar).

PREREQUISITE

MATH 151 (Calculus II) with a grade of "C" or better, or equivalent.

STUDENT LEARNING OUTCOMES

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

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

1. Extend geometric concepts of the Cartesian plane to 3-dimensional topics, such as the distance between points, vector arithmetic, the Euclidean norm of a vector.
2. Calculate and apply the geometric interpretation of the inner product, the cross product, and triple scalar product of 3-dimensional vectors.
3. Calculate the angle between vectors, and determine if two vectors are orthogonal.
4. Formulate the equation of the line in both vector and parametric form, and the equation of a plane in 3-space, and calculate the distances between points, planes and lines.
5. Recognize, compare and contrast the different quadric surfaces.
6. Change variables between rectangular, cylindrical, and spherical coordinates.
7. Graph simple single variable vector-valued functions in \mathbb{R}^2 and \mathbb{R}^3 .
8. Compute the limit, derivative, and integrals of vector-valued functions of one variable.
9. Determine continuity of a single variable vector-valued function at a single point and in a set.
10. Compute the unit tangent vector, principal unit normal vector, the arc length and the curvature of a vector-valued function.
11. Define and apply some elementary concepts in point set topology as they relate to sets in multidimensions.
12. Extend and apply the formal definitions of limits, and continuity from single variable calculus to functions of 2 and 3 variables.
13. Calculate first as well as higher order partial derivatives of multivariable functions.
14. Define the derivative and the concept of the differentials of multivariable functions, and calculate tangent planes to multivariable functions.
15. Apply the Chain Rule to a composition of multivariable functions.
16. Calculate the directional derivative of a multivariable function at a point in a given direction; and the gradient of such a function, applying the properties of the gradient to describe the behavior of the function.
17. Calculate the critical points of a differentiable multivariable function in an open ball.
18. Apply the second derivative test to determine if the critical points of a multivariable function are relative maxima, relative minima, or saddle points.
19. Use Lagrange's Theorem to compute the extrema of a multivariable function subject to given constraints.
20. Calculate double and triple integrals over rectangular and non-rectangular regions, by iterating, by changing the order of integration, or by changing variables.
21. Apply multiple integrals to areas, volumes, surface area, mass, centers of mass, and moments of inertia.
22. Sketch a vector field and compute its curl and divergence.
23. Compute the line integral of a vector-valued function over a piecewise smooth contour.
24. Determine the work done by a vector-valued multivariable function over a piecewise smooth contour.
25. Apply the concept of path independence and determine if a vector field is conservative, and if so, calculate its potential energy function.
26. Apply Green's, Stokes' and the Divergence theorems, and calculate surface integrals over parametrized piecewise smooth surfaces.

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 K-211). Walk-in tutoring for Math and Science. Tentative Hours: MTWTh 8:30am-6:30pm, F 8:30am-2:00pm. Phone: (619) 388-2898. Sign up for the 0-unit Credit / No Credit "course" Math 44, CRN 09362. No extra work is required. <http://www.sdmesa.edu/math-science-center>
- **STAR Tutoring** (Building I-300, Room 101). One-on-one weekly tutoring for eligible students (low income, first generation college, or disabled). Tentative Hours: MTWThF 8am-5pm. Phone: (619) 388-2706. <http://www.sdmesa.edu/star>

Center for Independent Learning (Learning Resource Center, LRC - "The Library"; 4th floor). Videotapes and DVDs may be available. Library Hours: MTWTh 7am-10pm, F 7am-5pm, Sat. 8am-3:30pm. Phone: (619) 388-2769. <http://www.sdmesa.edu/cil>

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

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 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.

DSPS students should give me test proctoring forms at least one week before they take the corresponding exams; I need to take them home to fill them out properly.

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.

DEADLINES (SEE THE "VERY TENTATIVE SCHEDULE")

Dropping without a "W"; add codes (*)	Fri.	Sept. 5	Week 2
Refund eligibility for dropped classes	Mon.	Sept. 8	Week 3
Credit / No Credit petition (not this class!)	Thurs.	Sept. 25	Week 5
Withdrawal deadline (**)	Fri.	Oct. 31	Week 10

Grades available online: Starting **Mon., Jan. 5, 2009**; (<http://studentweb.sdccd.edu>)

(*) Tuition and fees must be paid within five days of adding a course, or by Sept. 5, 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).

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. (See COME TO CLASS WITH / CALCULATOR INFO.)

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 time allowed to take the exam might be reduced, 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.

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 650 points (650 points = "100%"), divided as follows:

QUIZZES: 500 points (which is about 77% of 650 points)

-- 5 quizzes given, each worth 100 points (about 15% of 650 points)

QUIZ	TENTATIVE MATERIAL
Quiz 1	Chapter 14
Quiz 2	Chapter 15, Sections 16.1-16.2
Quiz 3	Sections 16.3-16.9
Quiz 4	Chapter 17
Quiz 5	Chapter 18

The quizzes are “closed book” and “closed notes,” but a scientific calculator may be allowed on some parts. (See COME TO CLASS WITH / CALCULATOR INFO.) Some notes will be allowed on the Final.

HOMEWORK (“HW”): 50 points (about 8%)

-- 10 points for each of 5 submissions (one corresponding to each quiz)

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

Make sure you clearly separate sections on your homework! Write your first name, last name, and “Math 252” 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.

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

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.

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 and ATTENDANCE: 40 points (about 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.

The final grade in this class will be affected by active participation, including attendance, as follows: Everyone will get the 40 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.**

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: 60 points (about 9%)

This is an essentially **comprehensive** exam that will be given **during the last class session, on Tues., Dec. 16, in our regular room**. It may be given before QUIZ 5 on that day.

The Final will probably consist of 15 “short response” questions.

You will be allowed to use one 8 1/2" by 11" sheet of notes for the Final. 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. (See COME TO CLASS WITH / CALCULATOR INFO.) No books are allowed.

The following are guarantees:

<u>Course score out of 650</u>	<u>Grade guarantee</u>
At least 585 (90%)	A
At least 520 (80%)	B or better
At least 455 (70%)	C or better
At least 390 (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 could be critical here.

The course must be taken for a standard “A-F” letter grade; the Credit / No Credit option is unavailable.

COME TO CLASS WITH / CALCULATOR INFO:

- The appropriate textbook(s), at least on days when I will answer your HW questions.
- The review notes when we are ready to review, if you can print them out.
- You may want to print out other course notes, as well, before or after a lecture.
- **A scientific (not graphing) calculator - you will need one for the course.**
Graphing calculators may 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 can also be good, though it relies on menus – I can help you with them.

- Some paper and a pencil or pen: for note taking and in-class exercises
- Homework (on exam dates; keep yourself updated on changes to our schedule!!)

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>

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 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., Oct. 31. It is the instructor's discretion to withdraw a student after the add/drop deadline (Fri., Sept. 5) due to excessive absences. 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.

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)

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

HW = Homework (and other) questions; Bring review notes for light review.

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

Week (Holidays / Deadlines)	TUESDAY	THURSDAY
1	8/26 (Day 1) Hello / 14.1 / 14.2	8/28 (Day 2) 14.3 / 14.4
2 Holiday (Mon., 9/1) Avoid W; Add codes (Fri., 9/5)	9/2 (Day 3) 14.4	9/4 (Day 4) 14.5
3 Refund deadline (Mon., 9/8)	9/9 (Day 5) 14.5 / 14.6	9/11 (Day 6) 14.6
4	9/16 (Day 7) 15.1 / 15.2 / HW	9/18 (Day 8) QUIZ 1
5 C/NC petition (Thurs., 9/25)	9/23 (Day 9) 15.2 / 15.3 / 15.4	9/25 (Day 10) 15.4
6	9/30 (Day 11) 15.5 / 16.1	10/2 (Day 12) 16.2 / 16.3
7	10/7 (Day 13) 16.3 / 16.4 / HW	10/9 (Day 14) QUIZ 2
8	10/14 (Day 15) 16.5 / 16.6	10/16 (Day 16) 16.6 / 16.7 / 16.8
9	10/21 (Day 17) 16.9	10/23 (Day 18) 17.1 and 17.2 / HW
10 W deadline (Fri., 10/31)	10/28 (Day 19) QUIZ 3	10/30 (Day 20) 17.1 and 17.2 / 17.3
11	11/4 (Day 21) 17.4 / 17.5	11/6 (Day 22) 17.6 / 17.7
12 Holiday (Tues., 11/11)	11/11 HOLIDAY	11/13 (Day 23) 17.7 / 17.8
13	11/18 (Day 24) 17.9	11/20 (Day 25) 18.1 / HW
(14 if counted) No classes this week!	11/25 NO CLASS	11/27 HOLIDAY
14 (or 15)	12/2 (Day 26) QUIZ 4	12/4 (Day 27) 18.2
15 (or 16)	12/9 (Day 28) 18.3	12/11 (Day 29) Ch.18 / HW
16 (or 17) Other classes may end Wed., 12/17	12/16 (Day 30) FINAL / QUIZ 5	

Grades available online: Starting **Mon., Jan. 5, 2009**; (<http://studentweb.sdccd.edu>)