

# MATH 141: PRECALCULUS

**SPRING SEMESTER, 2008; SYLLABUS DATE: 01/20/08**  
**COURSE REFERENCE NUMBER (CRN): 93112**  
**5.0 Units; Mon. and Wed., 6:00-8:25pm in Room H-215 (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 6:00-7:00pm, W 3:50-5:50pm, Th 6:00-7:00pm  
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 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; 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)**

• Precalculus (7<sup>th</sup> edition; Houghton Mifflin, 2007) by Larson / Hostetler.  
ISBN: 0-618-64344-3.

The CD-ROM that comes with the text is optional.

**Older editions are obsolete; do not get them! The sections and problem sets  
are different. The 6<sup>th</sup> edition was used in Spring 2006.**

• (Optional but highly recommended) Study and Solutions Guide for the above by Zook.  
ISBN: 0-618-64347-8.

The textbook for Math 141 varies from instructor to instructor. Get the right one!

My web site has Amazon links to other books and videos. Check ebay. The LRC (our  
library) may have old editions. The Schaum’s Outline paperbacks are much cheaper than  
textbooks, and they have many worked-out problems.

## TEXTBOOK WEB SITES

<http://math.college.hmco.com>

More directly:

[http://college.hmco.com/mathematics/larson/precalculus/7e/student\\_home.html](http://college.hmco.com/mathematics/larson/precalculus/7e/student_home.html)

Study guides and practice tests are available, but be forewarned that I may modify the material covered. There is no guarantee that the practice tests will look anything like my tests.

## PREREQUISITE

MATH 104 (Trigonometry) with a grade of "C" or better, or equivalent.

## COURSE DESCRIPTION

### Catalog Description

This course is a study of numerical, analytical, and graphical properties of functions. The course content includes polynomial, rational, irrational, exponential, logarithmic, and trigonometric functions. Additional topics include: inverse functions, complex numbers, polar coordinates, matrices, conic sections, sequences, series and the binomial theorem. This course is designed as a preparation for calculus and is intended for the transfer student planning to major in mathematics, engineering, economics, or disciplines included in the physical or life sciences. (FT). Transfer Credit: CSU and/or private coll/univ. UC Transfer Course List. Mathematics (MATH) 116 and 141 combined: maximum credit, one course. (CAN MATH 16, City, Mesa, Miramar).

## ACCOMMODATIONS; DSPTS

Students with disabilities or medical concerns who may need academic accommodations should notify their professors immediately. Check out the DSPTS web site at <http://www.sdmesa.edu/dsps> ... or visit the DSPTS 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.

DSPTS 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.

## 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. Define and distinguish between higher order polynomial functions and non-polynomial functions and relations, and analyze the graphs of functions by determining their domains and ranges.
2. Analyze properties of functions and their graphs, including symmetries, increasing and decreasing intervals and their end behavior asymptotes.
3. Prove algebraically and justify graphically when a function is one-to-one.
4. Graph a variety of algebraic, rational, exponential, logarithmic, and trigonometric functions, and where applicable, use rigid and non-rigid transformations, intercepts and asymptotes.
5. Perform algebraic operations on various functions including composition of functions, and determine the domain of the resulting function.
6. Calculate the inverse of a one-to-one function, determine the domain and range of the inverse and describe the relation between their graphs.
7. Solve equations and application problems involving exponential and logarithmic functions.
8. Simplify difference quotients involving a variety of functions including polynomial, rational, trigonometric, exponential, and logarithmic functions.
9. Apply a variety of root finding theorems and tests in order to factor polynomials or solve polynomial equations whose degree is higher than quadratic.
10. Simplify rational expressions and expressions involving radicals that arise from calculus operations, such as those from the product or quotient rules.
11. Determine the partial fraction decomposition of rational functions.
12. Define, evaluate, describe and graph all trigonometric and inverse trigonometric functions, and solve equations involving these functions.
13. Derive and prove fundamental trigonometric identities including the sum, difference, double and half angle identities.
14. Apply the laws of sines and cosines in solving oblique triangles and in application problems.
15. Represent complex numbers in standard, trigonometric and exponential forms and perform arithmetic operations with each.
16. Perform algebraic operations involving matrices.
17. Apply matrices in solving linear systems of equations.
18. Compute the determinant of a square matrix, and apply determinants to various applications.
19. Apply vector algebra to problems involving vector quantities.
20. Perform the vector operations of the dot product and the cross product, and formulate their geometric interpretations.
21. Analyze, identify, and graph the four conic sections.
22. Solve systems of non-linear equations [and inequalities], including those involving conic sections.
23. Define and analyze sequences and series, including arithmetic and geometric sequences and series, find the sum of finite and infinite geometric series.
24. Apply the binomial theorem to expand powers of binomial expressions.
25. Prove elementary mathematical statements using the principle of Mathematical Induction.

## 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 10am-6pm, F closed. Phone: (619) 388-2898. Sign up for the 0-unit Credit / No Credit "course" Math 44. 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). Tentative Hours: MTWThF 8am-5pm. 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 may be available. Library Hours: MTWTh 7am-10pm, F 7am-5pm, Sat. 8am-3:30pm. Phone: (619) 388-2769.

**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. 8	Week 2
Refund eligibility for dropped classes	Mon.	Feb. 11	Week 3
Credit / No Credit petition	Mon.	Mar. 3	Week 6
Withdrawal deadline (**)	Fri.	Apr. 11	Week 10 (excluding Spr. Break)

Grades available online: **June 2, 2008**; (<http://studentweb.sdccd.edu>)

(\*) Tuition and fees must be paid within five days of adding a course, or by Feb. 8, 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. (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 exam may be heavily penalized or not graded or returned at all. If you are a “borderline” grade case, makeups may hurt. Exam time may be shortened. 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 1000 points (1000 points = “100%”), divided as follows:**

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

**-- 4 midterms given, each worth 150 points (15% of 1000 points)**

<b>MIDTERM 1</b>
Preliminaries: Logic (see my Notes) and Basic Algebra (Appendix A)
Chapter 1: Functions and Their Graphs
<b>MIDTERM 2</b>
Chapter 2: Polynomial and Rational Functions
Chapter 3: Exponential and Logarithmic Functions
<b>MIDTERM 3</b>
Chapter 4: Trigonometry
<b>MIDTERM 4</b>
Chapter 5: Analytic Trigonometry
Chapter 6: Additional Topics in Trigonometry
<b>(FINAL)</b>
Chapter 7: Systems of Equations [and Inequalities]
Chapter 8: Matrices and Determinants
Chapter 9: Discrete Math
Chapter 10: Conics and Polar Equations

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

**HOMEWORK (“HW”): 85 points (8.5%)**

**-- 5 HW assignments, corresponding to the five exams:**

**15 points for each of the first four HWs (corresponding to the Midterms),**

**25 points for the last (corresponding to the Final)**

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.

**Make sure you clearly separate sections on your homework! Write your first name, last name, and “Math 141” 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 Study and Solutions Guide. Use the Study and Solutions Guide 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: 65 points (6.5%)**

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. Class participation may be a key factor in determining grade “borderline” cases.

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

This will be given **during the last class session, on Wed., May 21, in our regular room**. It will cover Chapters 7, 8, 9, and 10. I expect it to be closed book and closed notes.

**Bring a scientific calculator in case one is allowed. (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 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 Mon., Mar. 3 (Week 6).

## 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>

## 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 reasons for absences (including 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 Fri., Apr. 11. 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.

**The instructor may drop students for extended absences, especially close to the "W" deadline. Keep me informed of your status if you miss several roll calls in a row!**

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 review questions.

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

Week (Holidays / Deadlines)	MONDAY	WEDNESDAY
<b>1</b>	1/28 (Day 1) Hello / Prelims to A.3	1/30 (Day 2) A.4-7 / 1.1 / 1.2
<b>2</b> Avoid W; Add codes (Fri., 2/8)	2/4 (Day 3) 1.2 / 1.3 / 1.4	2/6 (Day 4) 1.4 / 1.5
<b>3</b> Refund deadline (Mon., 2/11) Holidays (Fri., 2/15 – Mon., 2/18)	2/11 (Day 5) 1.5 / 1.6 / 1.7 / 1.8	2/13 (Day 6) 1.9 / 1.10 / 2.1
<b>4</b> Holidays (Fri., 2/15 – Mon., 2/18)	2/18 <b>HOLIDAY</b>	2/20 (Day 7) 2.2 / HW
<b>5</b>	2/25 (Day 8) <b>MIDTERM 1</b>	2/27 (Day 9) 2.3 / 2.4 / 2.5
<b>6</b> C/NC petition (Mon., 3/3)	3/3 (Day 10) 2.5 / 2.6	3/5 (Day 11) 2.7 / 3.1
<b>7</b>	3/10 (Day 12) 3.2 / 3.3 / 3.4 / 3.5	3/12 (Day 13) 3.4 / 3.5 / 4.1 / 4.2
<b>(Don't count)</b>	3/17 <b>SPRING BREAK</b>	3/19 <b>SPRING BREAK</b>
<b>8</b>	3/24 (Day 14) 4.2-4.4 / HW	3/26 (Day 15) <b>MIDTERM 2</b>
<b>9</b>	3/31 (Day 16) 4.2-4.4 and 4.8 / 4.5	4/2 (Day 17) 4.6 / 4.7
<b>10</b> W deadline (Fri., 4/11)	4/7 (Day 18) 4.7 / 4.8 / 5.1 / 5.2	4/9 (Day 19) 5.3 / HW
<b>11</b>	4/14 (Day 20) <b>MIDTERM 3</b>	4/16 (Day 21) 5.4 / 5.5 / 6.1
<b>12</b>	4/21 (Day 22) 6.2 / 6.3 / 6.4	4/23 (Day 23) 6.5 / 7.1-7.3 / 7.4
<b>13</b>	4/28 (Day 24) 7.4 / Ch.7 / 8.1 / HW	4/30 (Day 25) <b>MIDTERM 4</b>
<b>14</b>	5/5 (Day 26) 8.1 / 8.2 / 8.3	5/7 (Day 27) 8.4 / 8.5 / 9.1 and 9.6 / 9.2 / 9.3
<b>15</b>	5/12 (Day 28) 9.3 / 9.4 / 9.5 / 10.3	5/14 (Day 29) 10.3 / 10.4 / 10.7 / 10.8 / HW
<b>16</b> Semester ends Sat., 5/24	5/19 (Day 30) HW	5/21 (Day 31) <b>FINAL</b>

Grades available online: **June 2, 2008**; (<http://studentweb.sdccd.edu>)