

AMS 3: Precalculus, Winter 2018.

MWF 9:20 – 10:25 pm, Merrill 102

<https://ams003-winter18-02.courses.soe.ucsc.edu/home>

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Office hours: MWF 11:00 am - 12:00 pm, Th 10:00 am - 1:00 pm, or by appointment.

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Required text: *Precalculus*, 3rd edition, by Sullivan and Sullivan.

Course Description: This is a precalculus course intended primarily for students in the social sciences. It covers the material a student needs to master before studying calculus — functions and their graphs; linear functions, quadratic functions, polynomials in general and rational functions; composition of functions and inverses; exponential and logarithm functions; basic trigonometry. Throughout the course an emphasis is placed on constructing *mathematical models* for relations and phenomena from a variety of sources, by considering different *case studies*.

Reading: The reading assignments listed with the lecture schedule are meant to be completed at least once *before* the corresponding lecture. *The lectures are prepared based on the assumption that the students have done the reading and they will be significantly easier to follow if you have read the material in advance.* After the lecture, you should read the material again, in greater depth.

⇒ The assigned homework (see below) is comprised of *even numbered* problems from the book. As part of the *reading*, you should work on *odd numbered* problems from the section(s) you are reading to test your understanding and technical proficiency. Solutions to the odd numbered problems appear in the back of the book.

Homework: Weekly assignments are listed in the lecture schedule. These assignments will be collected in class every Friday.

⇒ *Late homework is not accepted. The lowest two homework scores will be dropped.* ⇐

Exams: There will be two midterm exams in class and a comprehensive final exam. The exam dates are listed in the lecture schedule that follows.

Sections: Sections are not mandatory, but are *highly recommended*. Mastering the ideas and methods of this course requires discussion and practice. In section you will have the opportunity to engage in both activities under the guidance of an experienced Teaching Assistant. In particular, the TAs will review the homework in section.

⇒ *The TA will take attendance in section. Regular attendance in section can help students' grades in borderline cases.* ⇐

Special Accommodations: UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please contact the Disability Resource Center, which offers services that are confidential and free of charge. Contact DRC by phone at **831-459-2089** or by email at **drc.raisebox-1pt@ucsc.edu**. If you have an Accommodation Authorization Letter from the DRC, please submit it to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At that time, I would also like us to discuss ways we can ensure your full participation in the course.

Course grade: Your homework contributes 20 percent to your overall score in the class, the two midterms contribute 40 percent and the final exam contributes the remaining 40 percent. Letter grades will correspond (approximately) to the following ranges:

Overall Score	Grade
90 – 100	A– to A+
80 – 89	B– to B+;
65 – 79	C to C+
60 - 64	C-
50 – 59	D
0 – 49	F

*To pass the class, your overall score must be 65 or above
and you must score at least 50% on the final exam.*

CHEATING:

Cheating in any form (using unauthorized notes on tests or exams, copying from someone else, etc.) will not be tolerated. Any student caught cheating will be reported to the AMS department and to his or her college provost. In almost all cases, a student caught cheating will receive a failing grade. Students who help others cheat are also considered cheaters Cheating devalues everyone’s grades. You should not tolerate it either.

TIPS FOR SUCCESS

- ★ Come to all the lectures, and come prepared — read the assigned sections at least once before the lecture, so you have an idea of what we will be discussing in the lecture. You don’t have to read the material in depth the first time through.
- ★ Read the material again after the lecture, this time in more depth. Read actively: take notes, make a list of questions to ask. Try working the examples in the book/supplementary notes on your own before reading the solutions.
- ★ Work on the homework together with the second reading. Make a note of the problems that you don’t understand so that you can ask about them.
- ★ **Ask questions:** the more specific your question, the better and more helpful the answer is likely to be. You can ask questions in class, in section and during office hours.
- ★ **Attend sections regularly.** You can prepare for section by making a list of the homework problems you find most challenging/confusing.
- ★ Take advantage of all the resources: lecture, section, MSI, office hours.
- ★ Study with friends for a few hours a week.
- ★ The standard for a 5-unit course at UCSC is 15 hours of studying a week. These 15 hours include the time for lectures and sections, but this still leaves close to 10 hours a week you should be spending with the material outside of class.
- ★ If you feel that you are getting lost, take action. Don’t wait and hope ‘it goes away’. Come to office hours or ask questions in class (or section) to clear up any confusion.

Lecture Schedule with Homework and Exam Dates.

Monday, 1-8: Functions and their graphs.

Reading: Sections 1.1 - 1.3.

Wednesday, 1-10: Graphing techniques

Reading: Sections 1.4 - 1.5.

Friday, 1-12: Mathematical models: building functions.

Reading: Section 1.6.

Homework Assignment 1, Due Friday, 1-12

Section 1.1: 28, 36, 38, 48, 54, 56, 86, 96.

Section 1.2: 10, 26, 34(a, d, e), 42.

Section 1.3: 22, 26, 32, 34, 40, 68.

Section 1.4: 28, 32, 44, 48.



Monday, 1-15: *Holiday (Martin Luther King day)*

Wednesday, 1-17: Linear functions and linear models.

Reading: Section 2.1.

Friday, 1-19: Linear models from data: *lines of best fit*.

Reading: Section 2.2.

Homework Assignment 2, Due Friday, 1-19

Section 1.5: 8, 10, 14, 20, 30, 58, 60, 78.

Section 1.6: 2, 6, 14, 18.

Section 2.1: 18, 38, 44, 46, 52.



Monday, 1-22: Quadratic functions: algebraic properties.

Reading: Section 2.3.

Wednesday, 1-24: Quadratic functions: geometric properties.

Reading: Section 2.4.

Friday, 1-26: Modeling with quadratic functions.

Reading: Section 2.6.

Homework Assignment 3, Due Friday, 1-26

Section 2.2: 6, 8, 18, 22.

Section 2.3: 12, 18, 28, 34, 56, 82, 102, 106.

Section 2.4: 12, 18, 36, 46, 72, 88.

Section 2.6: 6, 10.



Monday, 1-29: *Midterm 1 Study: HW assignments 1-3.*

Wednesday, 1-31: Polynomial functions.

Reading: Section 3.1.

Friday, 2-2: Zeros of polynomial functions.

Reading: Section 3.2.

Homework Assignment 4, Due Friday, 2-2

Section 2.6: 14, 18.

Section 3.1: 16, 26, 42, 46, 50, 60, 62, 66, 70, 72, 78, 96.

Section 3.2: 12, 14, 22, 28.

Monday, 2-5: Rational functions: algebraic properties.

Reading : Section 3.4.

Wednesday, 2-7: Rational functions: geometric properties.

Reading : Section 3.5.

Friday, 2-9: Composite functions

Reading: Section 4.1.

Homework Assignment 5, Due Friday, 2-9

Section 3.1: 120 (use the *cubic regression* function on Wolfram Alpha).

Section 3.2: 34, 40, 52, 58.

Section 3.4: 14, 18, 28, 48, 54, 62.

Section 3.5: 8, 18, 26, 58, 62.

Monday, 2-12: Inverse functions.

Reading: Section 4.2.

Wednesday, 2-14: Exponential functions

Reading: Section 4.3.

Friday, 2-16: Logarithmic functions.

Reading: Section 4.4.

Homework Assignment 6, Due Friday, 2-16

Section 4.1: 12, 16, 22, 36, 42, 70, 72.

Section 4.2: 32, 34, 42, 48, 52, 62, 72, 96.

Section 4.3: 16, 20, 26, 28, 30, 38, 86, 106, 108.

Monday, 2-19: *Holiday (Presidents day)*

Wednesday, 2-21: Algebraic properties of logarithms and exponentials.

Reading: Sections 4.5 - 4.6.

Friday, 2-23: Mathematical models with exponentials and logarithms.

Reading: Sections 4.7 - 4.8.

Monday, 2-26: Catch-up and review.

Reading: Chapters 3 and 4.

Homework Assignment 7, Due Monday, 2-26

Section 4.4: 16, 24, 32, 118(a,b,c), 124.

Section 4.5: 30, 36, 38, 52, 90.

Section 4.6: 16, 28, 96.

Section 4.7: 12,18, 42, 48.

Section 4.8: 6, 12, 16, 24.

Wednesday, 2-28: ***Midterm 2*** *Study: HW assignments 4-7.*

Friday, 3-2: Measuring angles and the unit circle

Reading: Sections 5.1 - 5.2.

Monday, 3-5: Trigonometric functions.

Reading: Section 5.2.

Wednesday, 3-7: Properties of trigonometric functions

Reading: Section 5.3.

Homework Assignment 8, Due Wednesday, 3-7

Section 5.1: 36, 44, 64, 68, 72, 82, 96, 102, 106, 122.

Section 5.2: 14, 20, 24, 26, 44, 54, 122, 130, 132.

Section 5.3: 20, 24, 36, 42, 44.

Friday, 3-9 Graphing Sine and Cosine functions.

Reading: Sections 5.4 and 5.6.

Monday, 3-12: Graphing other trigonometric functions.

Reading: Section 5.5.

Wednesday, 3-14: Some trigonometric equations.

Reading: Section 6.3.

Homework Assignment 9, Due Wednesday, 3-14

Section 5.3: 98, 104, 106, 120.

Section 5.4: 10, 12, 18, 20, 24, 30, 64, 66, 92.

Section 5.5: 18, 30, 40.

Section 5.6: 4, 12, 30 ($x = \text{months}$), 36 (see example 4 in Section 5.6).

Friday, 3-16: Catch up and review.

Tuesday, 3-20: ***Final Exam: 12:00 – 3:00 pm***