

MATH 130 – WINTER 2017

COLLEGE ALGEBRA

Instructor:	Alina Birca
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Office:	Building 61 – Room 1658 , by appointment only (1:00 – 1:30 pm)
Text:	<i>College Algebra</i> (12 th edition) by Lial/Hornsby, Schneider
Student Access Kit	Not mandatory. It is available bundled with your textbook or as a standalone item.
Sections	MTWR # 30297 1:30 – 4:20 pm # 30298 4:30 – 7:20 pm (Bldg 61 – Room 2302)

Course Objectives

This is a function oriented course including the concept of function and function notation. The course includes an in depth investigation of polynomial, rational, root, exponential and logarithmic functions , including their equations, graphs, and behavior. Tools from arithmetic, geometry and algebra are used to develop definitions, standard notations and theorems involving these functions and their application in the physical world. Other topics include sequences, series, the binomial theorem, and mathematical induction.

Some of the course objectives are:

- Simplify expressions, including polynomial, rational, radical, exponential and logarithmic.
- Solve equations and inequalities, including linear, higher-order polynomial, rational, radical, exponential, logarithmic and literal.
- Perform operations with functions including composition
- Determine domain, range and inverse of functions.
- Graph functions and relations such as: piece-wise defined functions, polynomial functions, rational functions, exponential functions, logarithmic functions, linear transformations of basic functions and circle.
- Solve systems of equations (linear and non-linear) by methods of substitution, elimination, graphing and matrices.
- Analyze a variety of applied problems (including variation problems) and work with the resulting equations or functions to respond to the problems, using complete sentence responses.
- Expand powers of binomials using the Binomial Theorem.
- Prove statements using mathematical induction.
- Recognize patterns in sequences and series (arithmetic and geometric) to determine terms and find sums, using sigma notation as appropriate.
- Demonstrate properties of matrices.

My Expectations

To succeed in this course you must attend class regularly, study often, utilize the resources available, and ask questions if you are confused.

Prerequisites

There is a prerequisite for this course (Math 71 –Intermediate algebra), and I expect that you demonstrate college arithmetic skills as well as elementary and intermediate algebraic skills, including solving first and second degree equations and inequalities, factoring polynomials, working with fractions and rational expressions, graphing lines and parabolas. **It is your responsibility to know the prerequisite material when you register for this class.** If you do not know the material covered in the previous classes, it would be better for you to take the previous class (Math 71) or review that material first, then register for Math 130.

Late Work

Be prepared with all assignments on the day they are due. As a rule, there are no make up tests. I have been having an issue with students coming to class late and students turning in late work. I have found a need to develop a policy that is consistent and fair to all my students including those that get to class on time and those who turn their work on time. See the table below for my policy on assignments that are turned in after the beginning of the class the assignment is due.

On Time: Turned in at the beginning of class	100% - missed/incorrect questions
Turned in next class meeting Only completed homework will be accepted. Do not turn in late homework if it is incomplete	50% - missed/incorrect questions
Turned in beyond the next class meeting	0% - no credit given

Attendance and Participation

Understanding math requires more than just reading a textbook. Listening and participating in the class activities are as important as solving problems. College policy requires that you attend every class meeting. Moreover, I do notice when you do not show up. If your grade is on a borderline, those with regular attendance are more likely to be on the higher side of the line. In addition, you miss the material from that day and that day's quiz.

NOTE: You the student are responsible for dropping the course should you decide not to continue in it. If you stop attending and doing the work and you fail to drop, you will receive a failing grade in this course. If you miss class, are late more than 15 minutes, or leave early during the add period, you will be dropped and someone on the wait list will be added. If you are absent two times or more, you may be dropped from class. Being late or leaving early counts as half a day.

Calculators

A graphing calculator is NOT REQUIRED for this class! All of the problems I will assign this semester will be done using paper, pencil, ruler and a scientific calculator. No graphing calculators are allowed during the tests. No cell phones/smart watches are allowed during the tests.

Study Time

You are expected to study about two hours outside class for every hour in class – that is an average of about 20 hours a week. Some students will need more time to study while others might be successful with fewer hours.

Do not panic; just be ready to put your work in. Work includes, but is not limited to:

- being an active participant in class: pay close attention, ask questions, and take copious notes
- reading the chapters
- as you read a chapter, you try each example problem. You should be able to solve the problem on your own before going on to the next problem. You should do this for each chapter.
- Going through your lecture notes, recopying them if necessary, until you understand everything that was presented in the lecture and can do the problems that were done in class on your own
- doing all of the assigned homework
- getting together with other students to discuss and work on the problems
- when you are done with the homework, you should be able to answer any of the questions or do any of the problems assigned on your own, from the beginning
- your written work should be clear enough that any of your peers can understand it

Respect in the Classroom

Leaving during class

It is disruptive to me and other students when an individual wanders in and out of the classroom. This is a classroom not a movie theater. If you have to leave class while it is in session, **leave permanently for that class period**. I will not allow you to reenter the room. Go to the restroom before you come to class. Make important phone calls ahead of time.

Coming to class late

To succeed in this course you must get to class on time. Walking in late is disruptive to me and other students. I know there are times when things happen that are beyond your control. However, if you are habitually late I will ask you to drop this class and take a class at a time that works better with your schedule. Make sure that you also read the *Attendance and Participation Policy* above.

Cell Phones

The use of cell phones during class is disruptive to me and the students that sit near you. Cell phone use in class shows a lack of respect to your peers. You may use your cell phone during breaks. I expect your cell phones to be in your pocket, purse, or backpack at all other times. Otherwise, I will ask you to leave the classroom. You are not allowed to have your cell phone during a test/quiz. You must put it in your backpack, purse, or on my front desk. If I see you with a cell phone on you during a test/quiz, you will receive an F (0 points) on that test.

Help and Resources

If you are feeling lost or overwhelmed: talk to me, use my website, visit the TMARC (Math Activities Resource Center) . TMARC is located in building 61 on the first floor, room 1314, near the elevator. TMARC phone extension is 5389. TMARC offers services including free tutoring, study spaces, tutorial software, video lectures on CR-Rom or DVD, calculator rentals, textbooks, solution manuals, and handouts

The tutors and instructor in charge with the lab (Rene Pyle) will be able to answer your questions. They can help you understand the problems, but they cannot do the homework for you. You, the student, are expected to do the homework. TMARC would also be a great place to meet if you decide to start or join a study group.

Accommodations

If you feel that you have a disability that may prevent you from succeeding in this class, please contact the DSPS office located in the Student Services Building 9B.

Academic Integrity

According to the Mt. SAC policy on academic integrity an instructor who determines that a student has cheated may give the student a failing grade for the assignment. The actions shall be reported to the Dean, Student Services, and Director, Student Life. Plagiarism or cheating will not be tolerated in my class. There will be a zero on the assignment and risk failing the course.

Some examples of cheating include, but are not limited to: having or using unauthorized materials or calculators during any exam or quiz, notes concealed in or written on clothing, hats, desk, or skin (as examples), looking at another student's work during any exam or quiz, removing an exam or quiz from the classroom, taking photos of exams and quizzes, allowing another student to look at your exam or quiz, or allowing another student to copy your homework or other assignments, turning in work that was generated by other individuals, having a cell phone at your seat during an exam (if you have a cell phone in your possession I consider that cheating).

Organization, Grading and Requirements

I recommend you have a 3-hole binder with 3 separators, labeled as follows:

LECTURES

HOMEWORK

TESTS & QUIZZES

- **LECTURES** – Pay attention in class to what I say and do, and make careful notes. In particular, note the problems I work on the board, and copy the complete solutions as well as the theory presented in each section. Work as neatly as you can. Write your symbols clearly, and make sure the exercises are clearly separated from each other. Do not hesitate to ask questions in class. It is not a sign of weakness, but of strength. There are always other students with the same question who are too shy to ask. Do not expect to always understand everything in class. If necessary, rewrite your notes when you get home.
- **HOMEWORK** – Before you start on homework assignments, rework the problems I worked in class as well as all examples from the textbook . You should be able to solve the problems on your own. Make sure you check your previous work against the solution sections posted on my website. Print out the solutions from my website for your reference.
- Keep all homework, quizzes and tests that are returned to you in your binder. Use them when you study for future tests and for the final exam.

Assignments in the course are divided into four areas and are worth a total of 1000 points. Those earning 900 points or more will be awarded an A, 800 to 899 points a B, 700 to 799 points a C, 600 to 699 points a D and less than 599 points an F.

Homework 10%

The **written homework** is due at the beginning of the class. In general, this homework is **due the day of a test/quiz**. Read carefully all the directions from the homework handout. **Sloppy homework will not be graded.**

Homework that does not follow ALL the directions will not be graded. You must staple each section separately, as only one or two random sections will be collected. You are encouraged to discuss assignments with your classmates; however, you are required to write up your work independently. Copied homework will not be tolerated and identical, or nearly identical, assignments will share a single homework score. Each homework is worth 20 points. I will make every effort to address homework questions in class as time permits. Please feel free to come to my office hours (make an appointment first) or contact me by email if you need additional help.

Quizzes 20% points

Two quizzes will be given (see Tentative Class Schedule). They may be given at the beginning or at the end of the class. These quizzes will be similar to the exercises and examples done in class as well as homework problems assigned from the topics covered up to that point. For an exercise to be complete there needs to be a detailed solution to the problem. Do not just write down an answer. **No proof, no credit given!** Each quiz is 100 points.

Tests 40% points

Two tests will be given over the major areas addressed in the course. Each test is 200 points. For an exercise to be complete there needs to be a detailed solution to the problem. Do not just write down an answer. **No proof, no credit given!**

Comprehensive final 30% points

The final is a 2 ½ hour cumulative exam and it is held on **Thursday, February 16**. Final exam is 300 points. If you qualify (homework score must be at least 70%), you may use the final exam percent score to replace your lowest test/quiz score. However, a test/quiz with a score of zero cannot be replaced by the final score. You must take the final to pass this class.

Grade Sheet

Homework 1		/20
Homework 2	+	/20
Homework 3	+	/20
Homework 4	+	/20
Homework 5	+	/20
	+	
HOMEWORK	=	/100
Quiz 1	+	/100
Quiz 2	+	/100
QUIZZES	=	/200
Test 1		/200
Test 2	+	/200
TESTS	=	/400
FINAL EXAM	=	/300
TOTAL	=	/1000

Tentative Class Schedule

DATE		TOPICS	ASSIGNMENTS DUE
Monday	January 9	Chapter 1 – Review 2.1	
Tuesday	January 10	2.2, 2.3	
Wednesday	January 11	2.3, 2.4, 2.5	
Thursday	January 12	2.6, 2.7	
Monday	January 16	Martin Luther King Jr. Holiday	
Tuesday	January 17	Quiz 1 2.7, 2.8	Homework 1
Wednesday	January 18	2.8, 3.1	
Thursday	January 19	3.2, 3.3	
Monday	January 23	3.4	
Tuesday	January 24	3.5 Review	
Wednesday	January 25	Test 1 3.5	Homework 2
Thursday	January 26	3.6, 4.1	
Monday	January 30	4.2, 4.3	
Tuesday	January 31	4.4, 4.5	
Wednesday	February 1	4.6	
Thursday	February 2	Quiz 2	Homework 3
Monday	February 6	5.1, 5.2	
Tuesday	February 7	5.2, 5.7	
Wednesday	February 8	5.6, 7.1	
Thursday	February 9	7.2, 7.3 Review	
Monday	February 13	Test 2 7.4	Homework 4
Tuesday	February 14	7.4, 7.5	
Wednesday	February 15	Review	
Thursday	February 16	Final exam	Homework 5

10 Rules of Good Studying

by Barbara Oakley, PhD, PE

- 1. Use recall.** After you read a page, look away and recall the main ideas. Highlight very little, and never highlight anything you haven't put in your mind first by recalling. Try recalling main ideas when you are walking to class or in a different room from where you originally learned it. An ability to recall – to generate the ideas from inside yourself – is one of the key indicators of good learning.
- 2. Test yourself.** On everything. All the time. Flash cards are your friend.
- 3. Chunk your problems.** Chunking is understanding and practicing with a problem solution so that it can all come to mind in a flash. After you solve a problem, rehearse it. Make sure you can solve it cold – every step. Pretend it's a song and learn to play it over and over again, so the information combines into one smooth chunk you can pull up whenever you want.
- 4. Space your repetition.** Spread out your learning in any subject a little every day, just like an athlete. Your brain is like a muscle – it can handle only a limited amount of exercise on one subject at a time.
- 5. Alternate different problem-solving techniques during your practice.** Never practice too long at any one session using only one problem-solving technique – after a while, you are just mimicking what you did on the previous problem. Mix it up and work on different types of problems. This teaches you both *how* and *when* to use a technique. (Books generally are not set up this way, so you'll need to do this on your own.) After every assignment and test, go over your errors, make sure you understand why you made them, and then rework your solutions. To study most effectively, *handwrite* (don't type) a problem on one side of a flash card and the solution on the other. Handwriting builds stronger neural structures in memory than typing. You might also photograph the card if you want to load it into a study app on your smart phone. Quiz yourself randomly on different types of problems. Another way to do this is to randomly flip through your book, pick out a problem, and see whether you can solve it cold.
- 6. Take breaks.** It is common to be unable to solve problems or figure out concepts in math and science the first time you encounter them. This is why a little study every day is much better than a lot of studying all at once. When you get frustrated with a math or science problem, take a break so that another part of your mind can take over and work in the background.
- 7. Use explanatory questioning and simple analogies.** Whenever you are struggling with a concept, think to yourself, How can I explain this so that a ten-year-old could understand it? Using an analogy really helps, like saying that the flow of electricity is like the flow of water. Don't just think your explanation – say it out loud or put it in writing. The additional effort of speaking and writing allows you to more deeply encode (That is, convert into neural memory structures) what you are learning.
- 8. Focus.** Turn off all interrupting beeps and alarms on your phone and computer, and then turn on a timer for twenty-five minutes. Focus intently for those twenty-five minutes and try to work as diligently as you can. After the timer goes off, give yourself a small, fun reward. A few of these sessions in a day can really move your studies forward. Try to set up times and places where studying – not glancing at your computer or phone – is just something you naturally do.
- 9. Eat your frogs first.** Do the hardest thing earliest in the day, when you are fresh.
- 10. Make a mental contrast.** Imagine where you've come from and contrast that with the dream of where your studies will take you. Post a picture or words in your workspace to remind you of your dream. Look at that when you find motivation lagging. This work will pay off both for you and those you love!

10 Rules of Bad Studying

by Barbara Oakley, PhD, PE

Avoid these techniques – they can waste your time even while they fool you into thinking you're learning!

- 1. Passive rereading** – sitting passively and running your eyes back over a page. Unless you can prove that the material is moving into your brain by recalling the main ideas without looking at the page, rereading is a waste of time.
 - 2. Letting highlights overwhelm you.** Highlighting your text can fool your mind into thinking you are putting something in your brain, when all you're really doing is moving your hand. A little highlighting here and there is okay – sometimes it can be helpful in flagging important points. But if you are using highlighting as a memory tool, make sure that what you mark is also going into your brain.
 - 3. Merely glancing at a problem's solution and thinking you know how to do it.** This is one of the worst errors students make while studying. You need to be able to solve a problem step-by-step, without looking at the solution.
 - 4. Waiting until the last minute to study.** Would you cram at the last minute if you were practicing for a track meet? Your brain is like a muscle – it can handle only a limited amount of exercise on one subject at a time.
 - 5. Repeatedly solving problems of the same type that you already know how to solve.** If you just sit around solving similar problems during your practice, you're not actually preparing for a test – it's like preparing for a big basketball game by just practicing dribbling.
 - 6. Letting study sessions with friends turn into chat sessions.** Checking your problem solving with friends, and quizzing one another on what you know, can make learning more enjoyable, expose flaws in your thinking, and deepen your learning. But if your joint study sessions turn to fun before the work is done, you're wasting your time and should find another study group.
 - 7. Neglecting to read the textbook before you start working problems.** Would you dive into a pool before you knew how to swim? The textbook is your swimming instructor – it guides you toward the answers. You will flounder and waste your time if you don't bother to read it. Before you begin to read, however, take a quick glance over the chapter or section to get a sense of what it's about.
 - 8. Not checking with your instructors or classmates to clear up points of confusion.** Professors are used to lost students coming in for guidance – it's our job to help you. The students we worry about are the ones who don't come in. Don't be one of those students.
 - 9. Thinking you can learn deeply when you are being constantly distracted** Every tiny pull toward an instant message or conversation means you have less brain power to devote to learning. Every tug of interrupted attention pulls out tiny neural roots before they can grow.
 - 10. Not getting enough sleep** Your brain pieces together problem-solving techniques when you sleep, and it also practices and repeats whatever you put in mind before you go to sleep. Prolonged fatigue allows toxins to build up in the brain that disrupt the neural connections you need to think quickly and well. If you don't get a good sleep before a test, nothing else you have done will matter.
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Mark your calendar, as there will be no reminders in class about this particular homework.

WRITE NEATLY and SPACE OUT YOUR WORK. On a clean sheet of paper write your name and class (Class number and hours- for example, Math 130, 1 – 4).

Syllabus Homework #1 – due by Wednesday, January 11 at the beginning of class.

- 1) From the list above, list what (if any) rules of good studying you have used up to this point.
- 2) From the list above, list what (if any) rules of bad studying you are guilty of ☺ .
- 3) Write a small paragraph describing where you want your studies to take you.

Syllabus Homework #2 – due by the end of week 5, Thursday, February 9, beginning of class.

- 1) From the list above, list what rules of good studying you have started implementing and when you first started. What rules of bad studying did you stop doing?
- 2) In a small paragraph, explain how these changes have affected you.