MATH 180 – FALL 2017
CALCULUS AND ANALYTIC GEOMETRY

Instructor: Alina Birca
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Office: Building 61 – Room 1658
Office hours: **M 10:55 – 11:25, 4:00 – 4:30; W 10:40 – 11:25, 4:00 – 4:30; F 10:40 – 11:25, 1:05 – 2:05**
Text: *Calculus early transcendentals* (8th edition) by James Stewart
Sections   MW   # 22458 4:30 – 6:35 pm & #22459 6:45 – 8:50 pm   Bldg 61 – Room 3319

Course Objectives

Some of the course objectives are:

1. Represent functions verbally, algebraically, numerically and graphically. Construct mathematical models of physical phenomena. Graph functions with transformations on known graphs. Use logarithmic and exponential functions in applications. Solve calculus problems using a computer algebra system.

2. Prove limits using properties of limits and solve problems involving the formal definition of the limits. Solve problems involving continuity of functions. Evaluate limits at infinity and represent these graphically. Use limits to find slopes of tangent lines, velocities, other rates of change and derivatives.

3. Compute first and higher order derivatives of polynomial, exponential, logarithmic, hyperbolic, trigonometric, and inverse trigonometric functions. Evaluate derivatives using the product, quotient and chain rules and implicit differentiation.

4. Use derivatives to compute rates of change in applications. Apply derivatives to related rates problems, linear approximations and differentials, increasing the decreasing functions, maximum and minimum values, inflections and concavity, graphing, optimization problems, and Newton's Method. Apply the Mean Value Theorem in example problems. Use L'Hospital's Rule to evaluate limits of indeterminate forms. Use a Computer Algebra Systems in applications of calculus.

5. Use antiderivatives to evaluate indefinite integrals and the Fundamental Theorem of Calculus to evaluate definite integrals. Evaluate integrals using the substitution rule and integration by parts.

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 an official prerequisite for this course (Math 160 – Precalculus), and I expect that you demonstrate college algebra and trigonometry skills. 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 160) or review that material first, then register for Math 180. There is free access to ALEKS software in the Math Success Lab (16D).

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 homework:

On Time : Turned in at the beginning of class	100% - missed/incorrect questions/not following all directions
Turned in **next class meeting** **Only completed homework will be accepted.** Do not turn in your homework if it is incomplete.	50% - /incorrect questions/ not following all directions
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 waiting list will be added. **If you are absent three times or more, you may be dropped from class**. Being late or leaving early counts as half a day.

Calculators

Most of the homework problems I will assign this semester will be done using paper, pencil, ruler and a scientific calculator. However, a graphing calculator *may* be necessary for some of the homework problems. You could borrow a graphing calculators from T-MARC. For some exercises, you might find the website wolframalpha.com to be useful. No Computer Algebra systems (CAS) , TI-Calculators or other similar devices will be allowed during quizzes and tests - only calculators similar to the *scientific* ones available in MARC.

Study Time

You are expected to study about two hours outside class for every hour in class – that is an average of about 8 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
- doing all of the assigned homework
- 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
- 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. If you need to leave during a quiz or exam for any reason, then you are agreeing that you have finished taking the exam.

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, ipads, tablets, etc
The use of cell phones and other electronics 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 a cell phone, smart watch or other electronic device 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, smart watch or other electronic device 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 **T-MARC** (Transfer Math Activities Resource Center). T-MARC is located in building 61 on the first floor, room 1314, near the elevator. T-MARC phone extension is 5389. T-MARC offers services including free tutoring, study spaces, tutorial software, video lectures on CR-Rom or DVD, calculator, 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. T-MARC would also be a great place to meet if you decide to start or join a study group.
Free tutorial services are also available at the **Learning Assistance Center**, building 6, room 101 and at **Math Success Lab**, building 16D.

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 students has cheated may give the students a failing grade for the assignment. The actions shall be reported to the Dean, Students 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/smart watch in your possession I consider that cheating).

Organization, Grading and Requirements

I recommend you have a **3-hole binder** with 3 separators: lectures, homework, exams.

- **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 cle arly, 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. Answers to all odd exercises are in the textbook.

- 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 100 points

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.** Homework must be done in pencil only. You must staple each section separately, as only one or two random sections will be collected. I will select and analyze 3 to 5 problems to correct. 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. I will make every effort to address homework questions in class *as time permits*. If you would like to ask a question from homework, please write down the number and the corresponding section of the problem you want to ask on papers so that we will not lose class time while you are flipping over the pages. **DO NOT ASK QUESTIONS ON HOMEWORK PROBLEMS THAT YOU HAVE NOT EVEN ATTEMPTED!** Please feel free to come to my office hours or contact me by email if you need additional help.

Quizzes 255 points

Three 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 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!** Exams must be done in pencil only. Please be neat and clear and show full details of your work, otherwise points will be deducted.

Tests 340 points

Two tests will be given over the major areas addressed in the course. Each test is worth 170 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!** Exams must be done in pencil only. Please be neat and clear and show full details of your work, otherwise points will be deducted.

Activity Labs +25/-35 points

Two computer projects will be assigned during the semester. Information and due dates about them will follow. First project is worth 15 points or – 20 (negative 20) if not done. Second project is worth 10 points or – 1 (negative 15) if not done.

Comprehensive final 280 points

The final is a 2 ½ hour exam and it is held on **Monday, December 11.** The final is a cumulative exam. If you qualify (homework score must be at least 70%) , you may use the final exam percent score to replace your lowest test or quiz score. However, a test/quiz with a score of zero cannot be replaced by the final score. Exams must be done in pencil only. Please be neat and clear and show full details of your work, otherwise points will be deducted.

You must take the final and have a minimum of 55% on the final exam in order to pass this class.

Extra Credit: Do not ask for extra credit. It may be offered, but not when requested! Your final grade in the course will (and should) reflect your level of mathematical knowledge, comprehension, and problem solving skills. It will not (and should not) reflect directly how much effort you put in, how much "stuff" you did, or how important it is for you to pass.

Tentative Class Schedule

DATE		TOPICS	ASSIGNMENTS DUE
Monday	August 28	Chapter 1 (review), 2.1	
Wednesday	August 30	2.2, 2.3	
Monday	September 4	**Holiday – Labor Day**	
Wednesday	September 6	2.2, 2.3	
Monday	September 11	2.5	
Wednesday	September 13	2.6, 2.7	
Monday	September 18	**Quiz 1** 2.4	**Homework 1**
Wednesday	September 20	2.8, 3.1, 3.2	
Monday	September 25	3.2, 3.3, 3.4	
Wednesday	September 27	3.3, 3.4	
Monday	October 2	Review	
Wednesday	October 4	**Test 1**	**Homework 2**
Monday	October 9	3.5, 3.6	
Wednesday	October 11	3.7, 3.8	
Monday	October 16	3.9, 3.10	
Wednesday	October 18	3.11, 4.1	
Monday	October 23	4.2, 4.3	
Wednesday	October 25	**Quiz 2** 4.4	**Homework 3**
Monday	October 30	4.4, 4.5	
Wednesday	November 1	4.7, 4.8	
Monday	November 6	4.9, 5.1	
Wednesday	November 8	5.1, 5.2	
Monday	November 13	Review	
Wednesday	November 15	**Test 2**	**Homework 4**
Monday	November 20	5.3, 5.4	
Wednesday	November 22	5.5	
Monday	November 27	Appendix G , 7.1	
Wednesday	November 29	7.1	
Monday	December 4	**Quiz 3** Review	**Homework 5**
Wednesday	December 6	Review	
Monday		**FINAL Monday December 11** 4:30 – 7:00 pm (#22458) 7:30 – 10:00 pm (#22459)	

Grade Sheet

Homework 1	+	
Homework 2	+	
Homework 3	+	
Homework 4	+	
Homework 5	+	
HOMEWORK	=	**/ 100**
Quiz 1		/85
Quiz 2	+	/85
Quiz 3	+	/85
QUIZZES	=	**/255**
Activity Lab 1		/15
Activity Lab 2	+	/10
ACTIVITY LABS	=	**/25**
Test 1		/170
Test 2	+	/170
TESTS	=	**/340**
FINAL EXAM	=	**/280**
TOTAL	=	**/1000**

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 differe nt 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 sire 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 takeover 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 t he 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 of 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 flo under 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 if 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.