MAC2312 ANALYTIC GEOMETRY & CALCULUS II
WRITTEN HOMEWORK ASSIGNMENTS
SUMMER 2014

Contact Information
Course Lecturer

Name:_____

Office:_____

Office Hours:_____

Email:_____

Tentative MAC2312 Summer 2014 Calendar

Week 1 (May 12): L1, L2, L3, Quiz 1
Week 2 (May 19): L4, L5, L6, Quiz 2
Week 3 (May 26): L7, L8, L9
Week 4 (June 2): L10, L11, L12, Quiz 3
Week 5 (June 9): L13, L14, L15, Quiz 4
Week 6 (June 16): L16, L17, L18, L19
Summer Break: June 23 to June 27
Week 7 (June 30): L20, L21, L22
Week 8 (July 7): L23, L24, L25, Quiz 5
Week 9 (July 14): L26, L27, L28, L29, Quiz 6
Week 10 (July 21): L30, L31, L32, Quiz 7
Week 11 (July 28): L33, L34, L35, L36, Quiz 8
Week 12 (August 4): L37, L38, L39

Holidays: May 26, July 4

Exam 1: June 5th, 7PM – 8:30PM
Exam 2: July 17th, 7PM – 8:30PM
Exam 3: August 4th, 7PM – 8:30PM
Final Exam: August 8th, 7PM – 9:00PM

Be at the exam site at least 10 minutes early to avoid being late.
Students arriving at the exam 10 minutes or more late will not be allowed in.

2 INTRODUCTION

2.1 COURSE CONTENT

This is the 2nd semester in a 3 semester calculus sequence. Intended topics will include techniques of integration (integration by parts, trigonometric functions, trigonometric substitutions, and partial fractions); improper integrals; L'Hospital's rule; infinite sequences and series; parametric equations; polar coordinates and polar representation of plane curves and some application of integral.

A minimum grade of C (not C−) in MAC 2312 satisfies four credits of General Education requirement and also satisfies the pure math portion of the State Writing/Math.

2.2 PREREQUISITES

This course assumes strong prior knowledge of algebra, trigonometry and calculus I. Calculators are NOT allowed in quizzes nor exams. A list of prerequisite topics/formulas is provided in section 6. Students must be competent with the topics covered in the list.

2.3 REQUIRED MATERIALS

Access to the textbook (or e-textbook) is required. Your instructor may use a shell of the lecture notes (available at Target Copy and online). Your instructor will say so during the class. The solutions manual is not required.

TEXT BOOK : Calculus, Early Transcendentals, 2nd edition, by Rogawski (e-book) will be used for this course. Hard copies of the book and the solutions manual are available for in-library use at the reserve desk of UF Marston library. Homework problems from the text are assigned and will be graded.

You may purchase the Access Card for the e-textbook from the UF bookstore. The access card allows a 12 months access to the entire e-book (covers both MAC 2312 and MAC 2313 material.)

A PDF file for the first week class material will be provided for you to use, temporarily, before drop/add ends on Friday, May 16. If you decide to stay in the course after the drop/add, you will need to purchase the access card in order to access the course material and the assigned homework problems.

2.4   E-LEARNING SAKAI

E-learning Sakai, a UF tool, is located at `http://lss.at.ufl.edu`. Use your Gatorlink name and password to login. All course information including your grade, course webpage, lecture note outlines, syllabus, make-up policy, office hours, free help information, test locations, mail tool, announcements, etc. can be accessed from this site.

GRADEBOOK: You are responsible for verifying that your grades are accurate. You have one week after a score has been posted to contact your instructor if you believe there has been a grading or recording error. If you do not bring your concerns to your instructor within the time frame, your instructor will not adjust your grades. There is no grade dispute nor grade adjustment at the end of the semester.

MAIL: Important course information is communicated in the syllabus and in the Announcements in Sakai.

Questions you have most likely are addressed in the syllabus, mail and/or announcement. Please check these resources before sending out emails. If after careful research and you still can't find an answer, contact your instructor.

ANNOUNCEMENTS: Relevant course information will be posted in Announcement. Critical class announcements can reach you immediately where you live (phone, tablet, computer) without taking up lecture time in the classroom. Make sure you check it regularly.

2.5   LECTURES AND CLASS EXPECTATIONS

This class meets for four 65-minute class periods a week. An approximate schedule for which weeks will cover which lectures and quizzes is at the beginning of the syllabus. Students are required to show up to all classes.

Lectures will be used to introduce you to the fundamental concepts and theory of calculus and will follow as closely as possible the lecture outline and calendar provided in this guide. Lecture serves as only one of several components of your education.

MAC 2312 is a 4 credit course, which means each student is responsible for spending 8 to 12 hours minimum per week preparing for this course outside the classroom. Most of this time will be spent working on homework, students are also expected to review their notes and read ahead regularly. Keep in mind that the goal is to be able to apply the techniques of calculus to problems you will see in the future, not just reproduce the problems you see in the class.

Attendance in lecture is required. You are responsible for learning lecture material missed due to an absence.

2.6   Class Expectations

Come to class prepared. Before coming to class, read the appropriate topics from the book. Make note of any definition, concepts, and/or examples that you did not understand. During the lecture, these concepts should become more clear. If not, you will have already formulated the question you want answered. Also, having read the section ahead of time should eliminate the need to write down everything that is put on the board, allowing you to listen more attentively.

Be familiar with your notes. Students should re-read and/or rewrite their notes on a daily basis. Actively rework each example completed in class, making sure you understand each step. Being familiar with your notes will make it easier to complete the homework assignments and will reduce the time and anxiety of studying for exams.

Do your homework daily. A list of homework problems is available on Sakai and it is always recommended to attempt as many problems as possible, assigned or not. Make sure to start each homework assignment the day the material is presented in lecture. Do not wait until the last couple of days before the corresponding homework is due to start an assignment.

Lastly, make sure to turn off and put away all electronic devices during class. If you must use your phone (for an emergency only), then quietly leave the classroom and return as soon as possible. If you know you will have to leave class early, please sit close to the back exit so that you do not disturb your classmates. Comprehending math requires focus. Turn off phones and the like while you study.

Upon successful completion of MAC 2312, the student should be able to:

1. Use the formula to integrate by parts. Recognize integrands for appropriate parts.

2. Use techniques for integrals of products of sines and cosines.

3. Use techniques for integrals of secants and tangents, cosecants and cotangents.

4. Use techniques of trigonometric substitution to integrate some forms of integrands.

5. Complete the square to express an irreducible quadratic polynomial as a sum or difference of squares to prepare for trigonometric substitution.

6. Perform polynomial long division to make a rational function proper.

7. Use the technique of partial fraction decomposition to reduce an integrand to a more easily integrable form.

8. Given a random integration problem, choose the proper method and proceed with integration.

9. Identify indeterminate limit forms.

10. Evaluate limits using L'Hospital's rule.

11. Recognize and evaluate improper integrals.

12. Determine if an improper integral diverges or converges (and if so, to what).

13. Identify and compare different types of infinite sequences.

14. Determine if a sequence diverges or converges (and if so, to what).

15. Recognize famous series in standard and non-standard forms.

16. Apply infinite series tests for convergence and divergence.

17. Determine the error associated with a partial sum of an alternating series.

18. Find the interval of convergence and radius of convergence for a given power series.

19. Generate power series representations of some functions from a geometric series perspective.

20. Generate power series representations of some functions from a Taylor series perspective.

21. Recognize and manipulate series using the substitution, differentiation, and integration of the geometric series. Recognize these series in summation and non-summation forms.

22. Recognize and manipulate important MaClaurin series (e^x , $\sin x$, $\cos x$, $\arctan x$,etc.)

23. Sketch the graphs of curves defined parametrically.

24. Use calculus techniques to analyze the behavior of graphs of parametrically defined curves — arclength, tangent lines, slope, concavity.

25. Sketch graphs of polar equations.

26. Find points of intersection of two or more polar functions.

27. Find slopes of tangents to polar-defined curves, find areas enclosed by polar curves.

28. Synthesize concepts from two or more separate sections from MAC 2312.

29. Determine the area between two curves.

30. Determine the volume of solids of revolution using Disk, Washer and Shell methods.

31. Determine the volume of solids of non-revolution.

32. Evaluate amount of Work in rope, spring, and drainage problems.

2.7   FREE HELP

In addition to attending your lectures, visit your instructor's office hours. In addition, the following aids are available. Don't fall behind and there is no need to struggle on your own.

- The Teaching Center Math Lab, located at SE Broward Hall, offers free tutoring. You may want to attend different hours to find the tutors with whom you feel most comfortable. For more information(hours, etc.), go to their website `www.teachingcenter.ufl.edu`. You can also request free one-on-one tutoring. You may also attend tutoring with the SI designated to our class. Students are strongly encouraging to use the Math Lab.

- Multiple copies of the text book and solutions manual are located at the reserve desks at Marston Library.

- Private Tutors: If after availing yourself of these aids, you feel you need more help, you may obtain a list of qualified tutors for hire (not free) at `www.math.ufl.edu`. Search 'tutors'.

- The Counseling Center has some information on developing math confidence. Go to `http://www.counseling.ufl.edu/cwc/Developing-Math-Confidence.aspx` for information on math confidence and information on joining the Academic Confidence Group.

2.8   SUCCESS

Success in MAC 2312 depends largely on your attitude and effort. Attendance and participation in class is critical. It is not effective to sit and copy notes without following the thought processes involved in the lecture or during office hours. For example, you should try to answer the questions posed in the lecture, at least mentally. Students who actively participate generally have greater success.

Be aware that much of the learning of mathematics at the university takes place outside of the classroom. You need to spend time reviewing the concepts of each lecture before you attempt homework problems. It is also important to spend some time looking over the textbook sections to be covered in the next lecture to become familiar with the vocabulary and main ideas before the next class. That way you will better be able to grasp the material presented by your lecturer. As with most college courses, you should expect to spend a minimum of 2 hours working on your own for every hour of classroom instruction. It takes roughly 39 lecture hours in colleges vs. 142 lecture hours in high school to complete a calculus course. While fall and spring semesters are 15 weeks, summer C is only 12 weeks.

Students are strongly encouraged to work together, discuss concepts and misconceptions together. Students learn to ask questions, and to learn by helping each other. It helps the students' engagement outside of class, helps students work through problems and learn together. You get your questions answered quickly, instead of waiting for office hours or the next lecture. It's a good way for students to collaborate, and the exchanges that students have help you be more engaged in the course and be more prepared and confident in classroom and in exams.

This type of cooperative learning is encouraged, but be sure it leads to a better conceptual understanding. You must be able to work through the problems on your own. Even if you work together, be with a group or with a tutor, each student must turn in his or her own work, not a copied solution, on any collected individual assignments.

When it comes to math questions, there are no dumb math questions, but you should always go over your notes first to make sure you can follow the worked out problems in the lecture. you should ask your questions by stating what you have tried and what you are stuck on to allow others to better assist you, instead of a general statement like "can someone tell me how to do number 3?"

Each of us learns differently, each of us teaches differently too. If after you have done all that are suggested above, put in great effort, and you are still not doing well in class, please do not suffer on your own, come talk to your instructor and let us find out together how to better help you succeed in this class.

2.9   STUDENTS WITH DISABILITIES

UF welcomes students with disabilities into the UF programs. If you have a disability-related need accommodations in this course, you must first contact the office of Disability Resources Center (352-392-8565, `www.dso.ufl.edu/drc`). The DRC will provide documentation to the student who must then provide this documentation to your instructor to be signed when requesting accommodation. Visit the DRC office as soon as possible to find out the details.

2.10   ACADEMIC HONESTY GUIDELINES

All students are required to abide by the Academic Honesty Guidelines which have been accepted by the University. The academic community of students and faculty at the University of Florida strives to develop, sustain and protect an environment of honesty, trust, and respect. Students are expected to pursue knowledge with integrity. Exhibiting honesty in academic pursuits and reporting violations of the Academic Honesty Guidelines will encourage others to act with integrity. Violations of the Academic Honesty Guidelines shall result in judicial action and a student being subject to the sanctions in the Student Code of Conduct. The conduct set forth hereinafter constitutes a violation of the Academic Honesty Guidelines (University of Florida Rule 6C1-4.017), `https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/`

Any suspicious activity during quizzes or exams will be considered as cheating and violators will be taken to honor court where you may face automatic failure or even expulsion. At the very least, you will receive a zero for this quiz/exam and you will not be allowed to retake the quiz/exam nor the opportunity to take the make up for this quiz/exam.

3   TESTING

There are three 90-minute evening exams and one two-hour semi-comprehensive final exam. The first three exams are from 7:00PM to 8:30PM. See the course calendar for the dates. The semi-cumulative final is on August 8, Friday from 7:00PM to 9:00PM. Room locations will be posted in the Announcement in Sakai one week prior to the exams. There is NO DROP for any exam.

Students are responsible for material covered in the lecture notes (including Now You Try It (NYTI) problems that we may not have had time to work out during lecture) and all assigned written homework problems. Some sample exams are included in the Lecture Outlines packet and more (along with answers) are available from the Teaching Center one week prior to the exam. Sample exams serves as an example the format of the exam and gives you problems to practice. Exam coverage and format may vary from semester to semester. Check announcement for the detailed information for your exam this semester.

No books, notes or calculators may be used on the exams. You must bring to each exam only* the following:

- Your UF Gator One Card.
- Soft lead #2 pencils.
- Knowledge of your section number.

*It is suggested that you do not bring anything of value to the exam since YOU ARE NOT ALLOWED TO TAKE ITEMS SUCH AS BACKPACKS AND PURSES TO YOUR SEAT.

NO CALCULATORS ARE PERMITTED. All electronic devices must be turned off and put away. This includes cell phones. Scratch paper will be provided.

The Test Form Code, as well as your UFID, name, and section number must be encoded correctly or you will lose 1 point. You must also take the test in your assigned test location or you will lose 3 points on your exam.

You should be at the exam site at least 10 minutes early. No one will be admitted to the exam 10 minutes after the official starting time of the exam. No one will be permitted to leave the test until 20 minutes after the official start time. Raise your hand if you have any questions or need to leave the room for an emergency, in which case, you will be escorted by an instructor.

4 GRADING

4.1 COURSE GRADE

The course is based on 325 points accumulated as follows:

Written Homeworks (5 @ 5 points each)	25 points (7.69%)
Quizzes (best 6 of 8 @ 10 points each)	60 points (18.46%)
Exams (3 @ 60 points each)	180 points (55.38%)
Semi-Cumulative Final Exam (1 @ 60 points)	60 points (18.46%)

Use the grade scale below to determine your final letter grade. The course grade is determined by the number of points you have, not by the percentage.

A   : 292.50 – 325.00 points
A− : 282.80 – 292.49 points
B+ : 273.00 – 282.79 points
B   : 260.00 – 272.99 points
B− : 250.30 – 259.99 points
C+ : 240.50 – 250.29 points
C   : 224.25 – 240.49 points
C− : 217.80 – 224.24 points
D+ : 211.30 – 217.79 points
D   : 201.50 – 211.29 points
D− : 195.00 – 201.49 points
E   :   0.00 – 194.99 points

For information on dropping courses and withdrawals go to `https://catalog.ufl.edu/ugrad/current/regulations/info/drops.aspx`

4.2 WRITTEN HOMEWORK

The written assignments posted on Sakai represents the minimum number of problems you should do in each section and serve as a basis for your questions in class. Homework must be done neatly and complete work must be shown for credit. Homework will be checked for completeness and a few problems will be graded for accuracy. The work should be your own and not copied from other sources to avoid honor code violation. Homework will be collected five times during the semester. Your instructor will announce the due dates in advance as well as which assignments you must hand in.

Some homework problems suggest the use of a graphing calculator. They are designed to help you visualize important concepts and to reinforce the mathematical processes involved. If you do not have a graphing calculator you can use an online tool such as `http://www.wolframalpha.com/`

The use of a calculator when doing homework is not required. Calculators are not permitted on quizzes nor tests.

4.3 QUIZZES

Quizzes will be administered in class. An tentative schedule of which weeks will have quizzes is at the beginning on the syllabus.

The best 6 out of 8 quizzes will be counted for your course grade.

If you feel there is a grading error or posting error on Sakai, you must discuss it with your instructor within one week after the scores are posted. No aids may be used on the quiz.

4.4 MAKE-UP POLICY

All make-up work must be completed by Friday, August 8.

Make-up Exams and Quizzes: If you have a conflict due to participation in a UF sponsored event, another assembly exam of a higher course number, religious holiday, or court ordered obligation you need to bring your documentation to your instructor at least one week before the exam or quiz to sign up for a make-up.

Since two quizzes are dropped, quizzes cannot be made up for any other reasons.

If other classes are scheduled during the exam time, University policy states that the assembly exam takes precedence over the evening class and the evening class instructor must provide make-up work and cannot penalize students who miss because of an assembly exam.

Instructions on Make-up Exam: The student is responsible for knowing the room and time of the make-up exam. This information will be emailed to students (who had signed up) at least three days before the make-up exam date. Each student must bring his or her UF Gator ONE ID card to the make-up exam. Make-up exam length and content may not match the regular exam exactly.

Written Homework Collection: Unless prior arrangements are made with your instructor, late homework will not be accepted. Homework must be turned in during the class period of the collection date.

4.5 INCOMPLETE

Students who are currently passing a course but are unable to complete the course because of illness or emergency may be granted an incomplete grade of I which will allow the student to complete the course within the first two weeks of the following semester. Note that

incomplete grades are limited to those students who can verify and document a valid reason for not being able to take the final exam. If you meet the criteria and you wish to take an incomplete grade, you must see your instructor during office hours at least one week before finals week to be considered for an I. An 'I' only allows you to make up your incomplete work, not redo your work.

5   WRITTEN HOMEWORK ASSIGNMENTS

See Sakai.

6   FORMULAS YOU ARE EXPECTED TO KNOW

Completing the square $\quad x^2 + bx + c = \left(x + \dfrac{b}{2}\right)^2 + \left(b - \dfrac{a^2}{4}\right)$

Law of exponents $\quad a^{n+m} = a^n \cdot a^m \qquad a^{n-m} = \dfrac{a^n}{a^m} \qquad (a^n)^m = a^{nm}$

Properties of logarithms

$$\log_b |xy| = \log_b |x| + \log_b |y| \qquad\qquad \log_b \left|\dfrac{x}{y}\right| = \log_b |x| - \log_b |y|$$

$$\log_b |x^a| = a \log_b |x| \qquad\qquad\qquad \log_b |x| = \dfrac{\ln |x|}{\ln b}$$

Parabolas $\quad y = f(x) = ax^2 + bx + c \quad$ Vertex at $x = -\dfrac{b}{2a},\ y = f\left(-\dfrac{b}{2a}\right)$

Circles $\quad (x-a)^2 + (y-b)^2 = r^2 \quad$ Center at (a,b), radius $= r$

Derivatives

$\frac{d}{dx}(\sin x) = \qquad\qquad \frac{d}{dx}(\csc x) = \qquad\qquad \frac{d}{dx}(\cos x) = \qquad\qquad \frac{d}{dx}(\sec x) =$

$\frac{d}{dx}(\tan x) = \qquad\qquad \frac{d}{dx}(\cot x) = \qquad\qquad \frac{d}{dx}(\arctan x) =$

$\frac{d}{dx}(a^x) = \qquad\qquad \frac{d}{dx}(e^x) = \qquad\qquad \frac{d}{dx}(\log_a x) = \qquad\qquad \frac{d}{dx}(\ln x) =$

<u>Chain Rule</u> $(f(g(x)))' = f'(g(x)) \cdot g'(x)$

<u>Derivative of an Inverse</u>   If $g = f^{-1}$, then $g'(x) = \dfrac{1}{f'(g(x))}$.

<u>Integrals</u>

$$\int \frac{1}{x} \, dx =$$

$$\int e^x \, dx =$$

$$\int a^x \, dx =$$

$$\int \sin x \, dx =$$

$$\int \cos x \, dx =$$

$$\int \tan x \, dx =$$

$$\int \cot x \, dx =$$

$$\int \sec^2 x \, dx =$$

$$\int \csc^2 x \, dx =$$

$$\int \sec x \tan x \, dx =$$

$$\int \cot x \csc x \, dx =$$

$$\int \tan^2 x \, dx =$$

$$\int \cot^2 x \, dx =$$

$$\int \frac{1}{a^2 + x^2} \, dx =$$

<u>Trigonometric Identities</u>

$\sin^2 x + \cos^2 x = 1$ $\tan^2 x + 1 = \sec^2 x$ $1 + \cot^2 x = \csc^2 x$

$\sin^2 x =$ $\sin 2x =$

$\cos^2 x =$ $\cos 2x =$

<u>Know values of</u> $\sin x$, $\cos x$, and $\tan x$ at $x = 0$, $\frac{\pi}{6}$, $\frac{\pi}{4}$, $\frac{\pi}{3}$, $\frac{\pi}{2}$; and know values of $\arctan(a)$ at $a = 0$, 1, $\sqrt{3}$, $\frac{\sqrt{3}}{3}$. Also know the values of the other trigonometric functions at these reference angles and know the values of all trigonometric functions at all of the angles of the unit circle corresponding to these reference angles.