MAC 2241 – Calculus for the Life Sciences – Spring 2010
Section 00814: M-R 11:00 – 12:05 in DSSC 128

Instructor: Brooke Quinlan
Email: bquinlan@hccfl.edu
Office: DSSC 220
Office Phone: 813-259-6313
My Website: http://www.hccfl.edu/faculty-info/brooke-quinlan.aspx (Bookmark it!)


CALCULATOR: A graphing calculator is strongly recommended for this course.

PREREQUISITE: MAC 1114 and MAC 1140, or MAC 1147, with a grade of “C” or better, or the required score on the HCC placement test. This course is intended for students who plan to pursue studies in life science fields such as biology, microbiology, marine science, pre-medical, pre-pharmacy, pre-veterinary, or pre-dentistry.

SOFTWARE: MathXL homework is required for this course. The bookstore has copies of the textbook that have MathXL packaged with them. Or, you can buy a 12-month license for $42.00, or a 24-month license for $70.00. However, if you used MathXL in a previous class, it is possible that the license will last through the end of this course, so you need to contact MathXL’s technical support at 1-800-677-6337 to see if your license lasts until at least May 6, 2010. The MathXL course ID for this course is: XL0F-N182-901Y-5CO2.

GRADING: The grading scale is the standard 10-point scale (90-100 is an A, etc.).

The final grade is computed as follows:

- Attendance Average = 2%
- You Try Average = 3%
- Homework Average = 15%
- Test Average = 60%
- Final Exam = 20%

SPECIAL ACCOMMODATIONS STATEMENT: Any student whose disability falls within the American Disabilities Act (ADA) and requires accommodations should contact the Office of Services for Students with Disabilities. The office is located in the Student Service Building Room 204. You may also reach the office by phone at (813) 259-6035.

CLASS RULES:
- Turn off all cell phones (or put in “silent” mode – not “vibrate”!) before class starts and put them away.
- I will deduct 5 points from your next test score each time I see you “texting” during class.
- If you answer a phone call during class time, I will deduct 10 points from your next test score, and I will mark you absent for that day. Bottom line: no cell phones during class time.
- Cheating is not permitted. Any form of academic dishonesty will result in an “F” in the course and may result in HCC disciplinary action.
My Schedule

Available Office Hour times are shaded and bolded.

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<th>MONDAY</th>
<th>TUESDAY</th>
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<td>9:30 – 10:35</td>
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**ATTENDANCE:**

- Attendance will be taken at every class, and you are expected to attend every class meeting. History has shown that missing a single class meeting results in a 10-20% lower score on the following test due to missing all of the material taught on that day.

- **Attendance counts as 2% of your final grade in the course.** The attendance grade is calculated by dividing the number of days you were in class by the number of days that the class met.

- You are expected to arrive on time. Late arrivals will be marked as “Tardy”, and 2 Tardy’s will equal 1 unexcused absence when calculating the attendance grade.

- If you need to leave class early, let me know before class begins. If you leave class without informing me prior to class starting, then I will mark you absent for that day.

**“YOU TRY”:**

- During most lectures, I will teach a new topic, do several exercises, and then give you a problem or two that I call a “You Try” problem. **Always write the “You Try” problems on a note card.** At the beginning of the semester I will give you a few note cards. These are just a starter set; you need to get some note cards of your own to have enough for the whole semester.

- Occasionally, I will collect the note cards containing the “You Try” problems from that day. I will grade the collected “You Try” problems based on effort. Because you are working these problems as you are learning a topic, I don’t expect them to be exactly correct. But I do expect you to put in your best effort when attempting the problems.

- Sometimes at the end of a class, I will give you a problem (or two) and tell you to bring it to the next class meeting. These count as "You Try" problems also and are fair game to be collected at the beginning of the next class, so make sure you always attempt these problems!

- At the end of the semester, the average of the collected “You Try” problems will count as 3% of your overall grade in the class.
TESTS:

- There will be six in-class tests, but I will use only the **five highest test grades** to compute your overall test average.

- **There will be NO makeup tests.** If you miss one test, your remaining five test scores will make up your test average. Any additionally missed tests will receive a grade of zero.

- If you know that you will miss a test you must make prior arrangements with me in order to take the test in the testing center BEFORE THE REST OF THE CLASS TAKES THE TEST.

- **No tests will be administered after the class has taken a test except for extreme circumstances, such as hospitalization.** If there has been an extreme circumstance that caused you to miss a test, then you need to notify me via email as soon as possible (and before the next class meeting). FYI, "My car wouldn't start" is not an "extreme circumstance". There are these things called taxis you can call and they come to your house and pick you up and take you wherever you need to go! It's like magic! Also, "I had a headache", "I didn't feel well", "My allergies were acting up", and "I was up all night studying and didn't hear my alarm" are not "extreme circumstances" either. You need to be an adult and show up on test days.

FINAL EXAM:

- If you take all 6 tests, and the average of all 6 tests is a 90% or higher, then you do NOT have to take the final exam. ☺ *(When computing this average, I will count the Test Review bonus points for each test, but I will not include bonus points from volunteering, blood donation, or movie worksheets.)*

- For those of you who do have to take the final exam, it will be **cumulative** and is worth 20% of the final grade in the course.

- Make sure you keep all of your old tests (and write down the correct answers when I go over the tests in class), because **all of the questions on the final exam come from the previous tests.**

HOMEWORK:

- The only way to learn math is by working exercises, so homework is required for the course. **All homework will be completed online** using MathXL software. The website for login is www.mathxl.com.

- If you do not have a computer at home, there are computer labs throughout campus that can be used for completing your homework assignments.

- MathXL homework is due by 11:59 p.m. on the dates specified on the attached schedule. There is one homework assignment for each section that we will be covering in the book.

- You can re-work a problem as many times as necessary in MathXL until you get the correct answer. **If you attempt the same problem 3 times and get it wrong (a red “x” will appear over the problem number along the top of the window), then just hit the “Similar Exercise” button and the problem will regenerate with new values. Since you can re-work missed problems, there is really no reason to not have a perfect homework score (or at least an “A”)!!!**

- The four lowest homework scores will be dropped.

- If you miss a due date for a legitimate reason (it is my decision what counts as “legitimate”) and would like an extension on the due date, you must notify me via EMAIL and state 1) why you didn’t turn the homework in on time and 2) which specific sections you missed. If I decide the reason is legitimate, then I will email you back with a new (later) due date.

**DO NOT APPROACH ME IN CLASS ASKING FOR A HOMEWORK EXTENSION.** All requests for homework extensions must be sent through EMAIL.

- Homework is worth 15% of your final grade in the course. If you do not have a passing grade on the homework, you will almost certainly NOT pass the course.
COURSE OUTCOMES:
Upon completion of the course the student should be able to show the use and application of mathematics in several widely diverse topics to be chosen from, but not limited to, the following:

1. **Limits**
   a. Find limits, one sided limits, limits at infinity, and infinite limits algebraically, numerically, and graphically.
   b. Define and determine the continuity of a function at a number, continuity of a composite function, and continuity on an interval.

2. **Derivatives**
   a. Find derivatives by evaluating the limit of the difference quotient.
   b. Find the slope and equation of the tangent line.
   c. Find derivatives of algebraic, trigonometric, exponential, and logarithmic functions using the power rule, the constant multiple rule, the sum rule, the product rule, the quotient rule, and the chain rule.
   d. Use derivatives to find average and instantaneous rates of change.
   e. Find higher order derivatives.
   f. Use first and second derivatives to sketch the graph of algebraic functions by finding:
      - Critical points
      - Intervals where the function is increasing and decreasing
      - Relative extrema
      - Intervals where the function is concave up and concave down
      - Inflection points
      - Asymptotes using limits
   g. Find absolute extrema on closed intervals.
   h. Use the Second Derivative Test for relative extrema.
   i. Find differentials of functions and use differentials for linear approximation.
   j. Differentiate implicitly and find related rates.

3. **Integrals**
   a. Find integrals of algebraic, trigonometric, exponential, and logarithmic functions without using integral tables.
   b. Understand the Fundamental Theorem of Calculus.
   c. Evaluate definite integrals and use definite integrals to find the area under a curve and the area between curves.
   d. Find the volumes of solids of revolution using the disk method.
   e. Integrate by parts.

4. **Applications**
   a. Use derivatives to solve optimization problems.
   b. Use differentials to approximate changes in real-life models.
   c. Find the rate of change of exponential and logarithmic functions used as mathematical models, particularly exponential growth and decay and logistic growth functions.

TEST REVIEW PROBLEMS

**DO ONLY THE ODD-NUMBERED PROBLEMS UNLESS AN EVEN-NUMBERED PROBLEM IS SPECIFIED!**
These reviews are worth up to 3 points per test. You MUST show work to get any credit.

Test 1:  
   - R.2: #15, 21, 29;  
   - R.3: #7, 9, 11;  
   - R.4: #13, 19, 21;  
   - R.6: #1, 17-21, 29-31, 51-56 all;  
   - Ch. 1 Review, p. 68-69: #13, 17;  
   - Ch. 2 Review, p. 128-129: #27-39, 53-73;  
   - Ch. 3 Review, p. 197-199: #5-31, 35-39, 40, 43, 45, 49

Test 2:  

Test 3:  
   - Ch. 5 Review, p. 317-318: #5-39, 43

Test 4:  
   - Ch. 6 Review, p. 363-364: #1-4 all, 6, 9-15, 18-21 all, 23-26 all, 29, 31, 34, 36

Test 5:  
   - Ch. 7 Review, p. 428-430: #7-39, 47-61, 68, 70

Test 6:  
   - Ch. 7 Review, p. 429: #63-66 all;  
   - Ch. 8 Review, p. 469-470: #5-9 all, 13-31, 35, 36, 45 (a & b)
BONUS POINT OPPORTUNITIES:

There are four ways to get bonus points in this class, as outlined below. **Any bonus points earned from options B, C, and D will be added to the sum of your test grades.**

A. **Test Reviews:** On the bottom of the previous page is a list of Test Review Problems which come from the Chapter Reviews in the textbook. Work these problems out in an orderly fashion. Number all of the problems and show all of your work for each problem. Then on the day of the test, you can hand these review problems in and I will look over them. The neatness and completeness of your work will determine the number of bonus points that will be added to your test (between 0 and 3 bonus points). Any bonus points that you earn for the Test Reviews are for that test only and are not transferable to other tests. The Test Review problems MUST be handed in on the day of the test.

B. **Donating Blood:** If you donate blood, I will award you **5 bonus points.** As proof, you must bring in the slip of paper they give you when you donate blood that has your name on it and the date of donation. You can donate blood every 8 weeks, so if you plan to do this twice during the semester, you need to donate near the beginning of the semester so there will be time to donate again before the end of the semester. (Note: if you are eligible to donate red blood cells using the ALYX system, this counts as **two** blood donations so you get the entire 10 points with that one donation. If you do ALYX, **make sure it is clearly noted on the paper they give you!**)

C. **Volunteering:** If you volunteer **4 hours** with a non-profit agency (such as a hospital, nursing home, animal shelter, etc.), I will award you **5 bonus points.** As proof, you must bring a letter from the volunteer coordinator or someone in charge that states the activity you performed, how long you volunteered for, the dates you volunteered on, and includes that person’s name and phone number.

**You can take advantage of options B &/or C up to twice a semester for a maximum of 10 bonus points.**

Thus, to get your maximum of 10 points, you can EITHER
- ☀️ donate blood twice (5 points × 2)
- ☀️ volunteer for 8 hours (4 hours + 4 hours = 5 points × 2)
- ☀️ donate blood once (5 points) + volunteer for 4 hours (5 points)

D. I have several copies of *An Inconvenient Truth* and *Who Killed the Electric Car?* on DVD. You can “check out” a copy of these DVDs from me, watch them, and fill out the worksheet about the movie (the worksheets are located on my website: [http://www.hccfl.edu/faculty-info/brooke-quinlan.aspx](http://www.hccfl.edu/faculty-info/brooke-quinlan.aspx)). Each movie/worksheet is worth 2 bonus points. If you have already seen one or both movies, then you can still receive the bonus points if you can convince a friend or family member who has NOT seen the movie to watch it and fill out the non-math portion of the worksheet. You must still complete the math portion. If you watch both movies and complete the worksheets, you can get 4 total bonus points.

**Bonus Point Opportunities Summary:**

- 3 points for each Test Review = 18 points
- Blood donation/volunteer work points from options B and/or C = 10 points
- 2 points for each movie times 2 movies = 4 points
- TOTAL NUMBER OF BONUS POINTS AVAILABLE IN THE COURSE = **32**

All bonus points get added to the "Tests" portion of your grade. No bonus points will be added to the final exam, "You Try", homework, or attendance portions of your grade. Please take advantage of these bonus point opportunities throughout the semester, and don't wait until the very end of the semester to do them.

**★Last day to withdraw without a grade: Thursday, March 18th★**
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<th>Date</th>
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