MATHEMATICS 115 – LIFE SCIENCES CALCULUS 1

COURSE INFORMATION FOR FALL 2009

1. The Basics

1.1. **Time and Place.** Lectures are held on MWF at 11:45 - 12:35 in MSC W301. All exams, including the final, are also held in our classroom. The weekly lab [see §2.1 below] is in MSC W302.

1.2. **Instructors.** The instructor responsible for the course is

Jake McMillen: MSC N406; `jamcmil@emory.edu`

1.3. **Text and Other Materials.** We will have one text for this course and Math 116:

Calculus for the Life Sciences, Bittinger, Brand and Quintanilla

A detailed syllabus is posted on the website for the course [see §3.1 below]. In addition, we will use other sources, almost all on the internet.

1.4. **Course Description.** This is a first semester mathematics course designed for students with an interest in majoring in the life sciences. The course has similarities with the usual first semester calculus but differs in that it focuses on modeling biological processes. We attempt to motivate and illustrate a great deal of the mathematics in the course with biological problems.

The second semester course, Math 116, differs substantially from the usual second calculus course, Math 112. It includes material on modeling biological systems with differential equations and on probability and statistics, and omits some of the standard calculus topics.

This sequence is not recommended for physics or economics majors. It is now the main mathematics requirement for majors in Biology and is recommended by NBB for its majors. See §6 for a list of mathematics requirements for the Biology BS degree. Math 115 also fulfills the basic math requirement for the Chemistry major.

1.5. **Evaluation.** The overall course grade is determined as follows:

- Quizzes/Assignments/Projects: 35%
- In-class Exams [2]: 30%
- Final Exam: 35%

The final examination will be **Friday, 11 December, 8:30am - 11:00am**. This exam will cover all of the course material. The time of the exam **cannot be changed**.

The in-class exams are **tentatively** scheduled for **Friday 9 October** and **Friday 20 November**. The times will be confirmed in class well in advance of the exam dates. Regarding absences from exams, see §5.2 below.

2. Labs, Office Hours and Reviews

2.1. **Labs.** Every student is enrolled in a lab section attached to this class. You must attend the lab at the time below:

Math 115 LB2: Tuesday 4:00 - 4:50 MSC W302

2.2. **Office Hours.** I will have scheduled office hours each week on Monday 2:00pm-3:00pm and Tuesday 3:00pm-4:00pm. You can also contact me by email to schedule an appointment at another time. Use the email address at the beginning of this document.

When you have questions about course material from the lectures or readings, please see me. If you have trouble understanding concepts or doing the assignments, you should make every effort to schedule a meeting. Please do not use email to ask detailed or lengthy questions – plain text is a poor medium for math.

2.3. **Reviews.** There will be review sessions scheduled before each in-class examination and before the final examination. We may also have some evening review/problem sessions during the term as the need arises.

3. Internet and Technology Use

3.1. **Website.** Just about all materials for the course will be posted as .pdf files on the course website. You access this by going to the url

`http://userwww.service.emory.edu/~jamcmil/math115.html`

Please consult the website several times each week. There will be postings containing

- reading assignments and exercises for each class
- information on the weekly lab
- announcements of in-class exams, quizzes, written assignments, and review sessions
- assignments to be graded for credit

3.2. **Other Websites.** We shall make use of web materials. Here is one source which is quite useful, particularly for extra problems and life science examples:

`http://www.math.ubc.ca/~keshet`

Go to the notes for Math 102 and follow the links. These are notes developed by Professor Leah Keshet and colleagues at UBC for its life science calculus sequence.

3.3. **Calculator and Laptop Use.** You may use a calculator such as a TI-83 Plus for doing calculations on tests and assignments. On tests, calculator use will be restricted for specific questions. For instance, you may be asked to graph a function without using your calculator, or to do differentiation or integration problems without using a calculator that does symbolic differentiation or integration.

3.4. **Other Technology.** You **may** use a tablet for taking notes. All cellphones, PDAs, laptops and devices with internet, phone or messaging capabilities **must be turned off and put away at the beginning of each class**.

4. Assignments and Quizzes

At the end of each class, a reading assignment and set of exercises will be given. Solutions to these daily exercise sets are **not** to be handed in. Keeping up with the course requires that you do the daily readings and exercises.

When a written assignment-for-credit is given, it will be posted on the class website under *Assignments*. If you begin working on assignments-for-credit when they are announced in class and posted, you will have lots of time. I am happy to talk to you about your work, but not so happy to do so 15 minutes before it is due.

There will be regular quizzes, about every two weeks, given in the lab. The topic will be announced the preceding week and posted on the website. If you miss a quiz, you receive a grade of 0. The bottom quiz score will be dropped in calculation of that component of your grade.

4.1. **Collaboration.** Face-to-face discussion of assignments-for-credit with other students in the course is permitted unless otherwise specified but you must prepare your own solutions. Copying assignment solutions is a violation of the Honor Code. Do not provide copies of solutions to assignments-for-credit to other students in hardcopy or electronically. No collaboration on exams or quizzes is allowed. This too is a violation of the Honor Code.

4.2. **Preparation of Written Work.** Take care to write legibly, and to leave space to ease reading and give a place to write comments. If an assignment, or an answer on a quiz or examination, is not readable, it will earn no credit.

In solving a problem on an assignment, quiz or examination, supply all necessary reasoning and calculations. If a graph is part of the solution, axes must be labelled, units marked off, the functions must be labelled, etc.

4.3. **Deadlines for Assignments.** Assigned written work must be handed in before the beginning of the class on the due date. Late assignments will not be accepted after the fact – if circumstances arise that will prevent you from completing written work on time, tell me about it well in advance.

5. Emory College Academic Rules

5.1. **The Honor Code.** The Emory College Honor Code applies to all work in this class, including assignments, quizzes, in-class examinations and the final examination. See

`http://www.college.emory.edu/current/standards/honor_code.html`

5.2. **Missed Exams.** Please see the section *Absences from Examinations* on p. 59 in the chapter Academic Regulations of the Emory College Catalog. Here is the address of the e-version of the catalog:

`http://www.college.emory.edu/current/standards/pdf/academic_regs.pdf`

The in-class exams during the term are "required midterm examinations" so are subject to the rule described there.

6. Biology Major Mathematics Requirements

There are **4** ways to fulfill the mathematics requirement for the B.S. degree in Biology:

(1) Math 115 and Math 116;

(2) 4 hours AP credit for AB calculus and Math 112Z;

(3) 4 hours AP credit for AB calculus and Math 116; or,

(4) 8 hours AP credit for BC calculus.