**Math 152- Spring 2014**

Mathematics for Life Sciences

Time: Monday and Wednesday from 10:10-11:00 AM in Dougherty Engineering room 416

Tuesday in Ayres B013- located in the basement level of Ayres. Check your individual schedule for specific time.

Instructor: Benjamin Levy

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Office: Ayres 208

Office hours: Mondays 12-1:130, Tuesdays 3:45-5, Wednesdays 1-2:30 and by appointment.

**Textbook:** The text for this course is available free of cost on our blackboard website. The textbook has changed since last semester so be sure to download an updated copy. I have created note outlines that will help us move through the material at an appropriate pace. The note outlines are located on our blackboard site and should be printed by each student. I am still compiling the notes so check back periodically throughout the semester to print the notes.

**Course Description:**

This course provides and introduction to a variety of mathematical topics of use in analyzing problems arising in biological sciences. It is designed for students in biology, agriculture, forestry, wildlife, pre-medicine and other pre-health professions. It is designed to provide an overview rather than a detailed introduction to any particular topic. The general aim of the course is to show how mathematical and analytical tools may be used to explore and explain a wide variety of biological phenomena that are not easily understood with verbal reasoning alone. The mathematical models will be used to illustrate answers to biological problems. The material from 152 consists of selected topics from differential and integral calculus and a small amount of differential equations.

All students will meet Mondays and Wednesdays in the Dougherty Engineering building from 10:10-11:00 AM. During this time we will work through note outlines that have been prepared ahead of time. The note outlines are located on our blackboard site and should be printed by each student. I am still compiling the notes so check back periodically throughout the semester to print the notes. Completed notes will be posted at the end of each class. Each student has a smaller recitation section that will be attended on Tuesday located in Ayres B013. Tuesday recitation sections will be used for MATLAB preparation and learning, active problem sessions, homework questions and to aid in further understand of the material. Since MATLAB skills will be taught during recitation, bringing a laptop to recitation classes could be very helpful. However, please show respect to your instructors by only using your computer when learning/using MATLAB.

Homework will be assigned to help students learn the material and to prepare for quizzes/tests. Homework will be collected at the beginning of recitation period as specified on the calendar located on blackboard. Late homework will generally not be accepted. Some homework problems will be graded for correctness and others will be graded for completeness. Even though all homework questions will not be graded, I cannot emphasize how important it is to work the problems, ask questions and seek extra help if needed.

The software package MATLAB will be used in this course and there will be some projects using MATLAB that will be collected and graded. The needed skills for these projects were taught in Math 151, but will be reviewed here as well. You can download this software to your computer from oit.utk.edu.

There will be 5-6 quizzes, 3 tests and 1 comprehensive final exam. Quiz questions will be directly from the homework while the tests will be new questions used to evaluate the skills you have developed through homework and quizzes. I will drop one quiz grade and one test grade at the end of the semester. The comprehensive final exam grade will automatically count for everyone. Quizzes and tests will take place during your recitation section.

**Attendance:** Students are expected to attend all classes. Attendance will be taken in all recitation sections and periodically during general lectures. Missing a significant number of classes will decrease ones homework/attendance grade.

**Grades:** Grades will be determined using the grading scale below.

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| Homework/Attendance 10%  Average of best 2 tests 40%  Quiz Average 15%  Project Average 15%  Final Exam 20%  Total possible 100% |

The grade scale is:

93-100 A, 90-92 A-, 87-89 B+, 83-86 B, 80-82 B-, 77-79 C+, 73-76 C,

70-72 C-, 67-69 D+, 63-66 D, 60-62 D-, below 60 F

**Blackboard:** I will use the blackboard course website to post assignments, announcements, select solutions and any other pertinent material for the course. To log onto blackboard go to bblearn.utk.edu and log on using your UTK web ID and password.

**Calculator:** A calculator is permitted for use in this class and I will be using a graphing calculator to illustrate some of the topics. I strongly recommend you buy or borrow a calculator for this course. Calculators can be borrowed through the math office on the second floor of Ayres.

**Make-up Policy:** Make ups will generally not be allowed barring any extreme/extenuating circumstances.

**Math Tutorial Center:** The Math Tutorial Center provides **free tutoring**. Location and hours of operation are posted at <http://www.math.utk.edu/MTC/> . Please make use of this free service.

**Classroom Etiquette:** Please be considerate of the instructor and those around you. Come to class on time and remain focused until you are dismissed. Turn off and put away cell phones, laptops, iPods and any other distractions. These types of things are very distracting to those around you. Do not talk to classmates at inappropriate times. Stay focused throughout the entire class. Please do not do anything that would make another student feel uncomfortable in any way.

**Every teacher has different expectations. To be fair, I want you to know some of the attributes that I personally value in a student and others that I don’t.**

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| **Please do…** | **Please do not…** |
| Attend every class | Use your phone during class |
| Arrive to class before it begins | Use your computer during class |
| Stay focused during class | Have conversations during class |
| Ask questions and seek help | Do anything to distract others |
| Work with others | Disregard Homework |
| Put forward significant effort | Dwell on any problem you have with the class- come talk to me about it! |

**Disability Services:** If you need course adaptations or accommodations because of a documented disability or if you have emergency information to share, please contact the Office of Disability Services at 2227 Dunford Hall at 974-6087.

**NOTE:** I reserve the right to adjust any of the information in this syllabus if needed.

The following is a rough schedule of what we will be covering and the homework associated with each topic. Be aware that exact dates may need to be adjusted as we move through material. Also, specific homework problems may be altered during class.

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| **Date** | **Class Description** | **Hmwrk** | **Assigned/Due** |
| Wed 1/8 | Class intro &  Introduction to Limits | #1 | Complete Handout  MATLAB question assigned in class |
| Mon 1/13 | Limits | #2 | 15.1 b, c, d, h, I, l  15.2 c  15.3 b  15.8 |
| Tues 1/14 | MATLAB, project 1, Limits | #3 | **Homework #1 due in class**  Compute the two limits found project 1 |
| Wed 1/15 | Continuity and The Intermediate Value Theorem | #4 | 15.1 e, k  15.2 d  15.3 c  **Intermediate Value Theorem question assigned in class** |
| Thur 1/17 | Last day drop without “w” |  |  |
| Mon 1/20 | MLK Day- NO CLASS |  |  |
| Tues 1/21 | Continuity  Quiz 1 on HW #1,#2,#3,#4 | #5 | 16.1 a, d  16.2 a, b  16.4 |
| Wed 1/22 | Rates of Change | #6 | 17.1  17.4 a |
| Mon 1/27 | Rates of Change | #7 | 17.4 b  17.6 a, b (estimate instantaneous rate of change)  17.7 |
| Tues 1/28 | Project 1, practice problems, hmwrk help |  | **Homework #5 & #6 due in class** |
| Wed 1/29 | Derivatives | #8 | 18.1 b  18.2 c, d |
| Mon 2/3 | Derivatives & Test 1 talk | #9 | 18.1 e  18.2 a |
| Tues 2/4 | Test 1 Problem Session, Quiz 2 on HW #5, #6, #7 |  | **Project 1 Due in Class**  **Homework #7, #8, #9 due in class** |
| Wed 2/5 | Computing Derivatives | #10 | 18.3 all  19.1 b, c  19.2 a, b |
| Mon 2/10 | Test 1 review |  | Submit topics and/or specific questions you would like me to cover on this day via email |
| Tues 2/11 | **Test 1** |  | **Test 1 in class on material through Tues 2/4** |
| Wed 2/12 | Computing Derivatives | #11 | 19.1 e, f, i, L  19.3 a, d  19.5 a, b |
| Mon 2/17 | Computing Derivatives and Critical Points | #12 | 19.1 j, n, o  19.3 b  19.6 b  19.12 |
| Tues 2/18 | Test 1 solutions, Computing Derivatives, Project 2 |  | **Homework #10, #11 due in class** |
| Wed 2/19 | Concavity, 1st & 2nd derivative tests | #13 | 20.1 b, g, h (don’t sketch graph of f(x)) |
| Mon 2/24 | Classifying critical points | #14 | 20.3 a  20.4 |
| Tues 2/25 | Project 2, Quiz 3 on HW #8, #9. #10. #11 |  | **Homework #12, #13, #14 due in class** |
| Wed 2/26 | Derivatives, Exponential models | #15 | 20.1 d, j (don’t sketch graph of f(x))  20.2 a, b, c  20.3 d  20.4 a  20.8 |
| Mon 3/3 | Optimization | #16 | 20.10  20.19 |
| Tues 3/4 | Test 2 problem session, Quiz 4 on HW #12, #13, #14, #15 |  | **Project 2 Due in Class**  **Homework #15 due in class** |
| Wed 3/5 | Optimization, Homework help | #17 | 20.13 a  20.16 hint: maximize profit where profit  20.1 e, f |
| Mon 3/10 | Test 2 review |  | Submit topics and/or specific questions you would like me to cover on this day via email |
| Tues 3/11 | **Test 2** |  | **Homework #16, #17 due in class** |
| Wed 3/12 | Riemann Sums | #18 | 21.1 a, c  21.2 a |
| Mon 3/17- Wed3/19 | Spring Break Begins- No Class |  |  |
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| Mon 3/24 | Antiderivatives | #19 | 22.3 a, b, c, d |
| Tues 3/25 | Test 2 Solutions, Quiz 5 |  | **Homework #18 due in class** |
| Wed 3/26 | The Fundamental Theorem of Calculus | #20 | 22.4 a, b, c  22.5 c, e  22.6 a  22.7 |
| Mon 3/31 | Methods of Integration | #21 | 23.1 a, b, d  23.8 a, f, g  23.9 a, b |
| Tues 4/1 | Last day to drop with a “w” |  | **Homework #19, #20 due in class** |
| Wed 4/2 | Methods of Integration | #22 | 23.2 a, b, c, d  23.8 b, c |
| Mon 4/7 | Methods of Integration | #23 | 23.6  23.7 |
| Tues 4/8 | Quiz 6 |  | **Homework #21, #22 due in class** |
| Wed 4/9 | Applications of Integration | #24 | TBA |
| Mon 4/14 | Differential Equations | #25 | TBA |
| Tues 4/15 | Test 3 Problem session |  | **Homework #23, #24, #25 due in class** |
| Wed 4/16 | Differential Equations | #26 | TBA |
| Mon 4/21 | TBD |  |  |
| Tues 4/22 | Test 3 |  |  |
| Wed 4/23 | Final Exam Discussion |  |  |
| Wed 4/30 | Final Exam |  |  |