

MAT 462 Real Analysis I
Course Syllabus
Siena Heights University

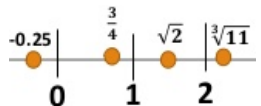

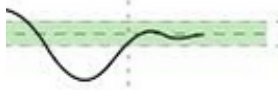
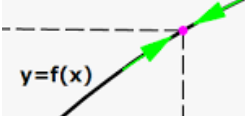
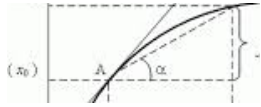
Prerequisites: Successful completion of Calc II. Discrete Mathematics or Linear Algebra is recommended.

Text: Real Analysis, by Bartle & Sherbert, 4th Edition, Wiley, 2011

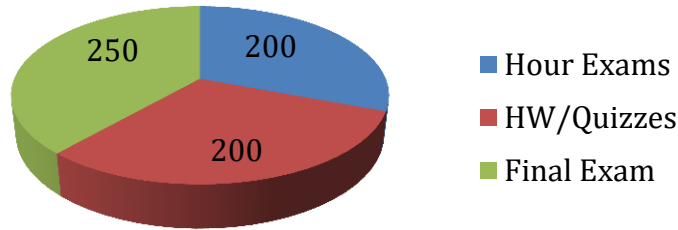
The instructor reserves the right to make changes to this syllabus without notice

Course Objectives: This course the expose the student to the formal theoretical background of the calculus of one-variable functions. Most of the semester will be spent proving the results from Calc I. Beginning with introduction to set theory on the real number line, we will progress through properties of \mathbb{R} , sequences, limits and continuous functions, and hopefully derivatives. All material will be rigorously developed with formal definitions and detailed proofs of all of the pieces.

Topics Covered

Set Theory	$(A \cup B)^c = A^c \cap B^c$ $(A \cap B)^c = A^c \cup B^c$
Real Number System	
Sequences and Series in \mathbb{R}	$\frac{n+1}{2n^2}$ 
Limits	
Continuous Functions	
Derivatives	

Grades



Grading Scale	
A	$[90, +\infty)$
B	$[80, 90)$
C	$[70, 80)$
D	$[60, 70)$
E	$(-\infty, 60)$

Method of Evaluation

- **Hour Exams** – 3 or 4 of them, evenly spaced during the semester. 50 minutes in length. Together will constitute 1/3 of your grade.
- **Homework/quizzes** – Nearly every day I will be collecting 1-3 homework problems from the text. Each assignment will be graded on a 10-point scale. In addition, every Friday we will have a quiz consisting of 2-3 problems directly from uncollected homework problems from the sections currently under discussion. All homework and quizzes together will count for 1/3 of your grade. No makeup quizzes will be given, and no late homework will be counted. To allow for the bad day/missed class, the two lowest HW/quiz scores will be dropped.

Standards for graded homework:

- Work should be neat, organized, and legible – one column only
 - Use filler paper or remove ragged edges
 - Use pencil and eraser (not pen)
 - Number each problem
 - Show work so that I can follow your steps and so that you don't need to recreate your work when studying homework for the exam
 - Leave space for my comments
 - **STAPLE** your papers together
- **Final Exam** – 200 points, comprehensive, time & location TBA. 1/3 of your grade

Practice Problems: Practice problems will be assigned for each section that we cover. They will be listed on board at the end of class, and on [Engrade](#) calendar entry for that date. I'll also try to keep a master problem list for the course up to date on [Engrade](#), working a couple weeks ahead if you would like to try to keep up on things. In general these problems will NOT be collected, but will be covered on the homework quizzes we have frequently (see above).

Late Work:

Collected assignments are to be submitted at the beginning of the class session on the due date (unless otherwise specified). No late assignments will be accepted.

Course Methods:

- The focus of this class is on learning through daily activities. We are moving from the computational concentration of Calculus I to the theoretical aspects. You will need to keep up by trying the assigned problems each evening. Problems will be collected each class period and returned the following class.
- Feel free to read the book and use the internet and other resources for help, but it is important that you attempt the problems yourself, giving them an honest effort. That is in fact the only way to learn this material.
- **We will review and discuss daily assignments** to provide instant and interactive feedback on your learning. Homework is assigned for every section, and you should plan to complete it once that section is covered in class unless otherwise stated. We will be discussing the assignment at the beginning of the next class, before proceeding to the next topic.
- You should keep a notebook of worked examples and written homework assignments. This course leads to a great deal of the mathematics of graduate school and other applied topics that you will encounter later in your studies or career. You should expect to be active participants in class discussions. *Successful completion of this course requires a substantial amount of out of class study* **(About 2 hours outside of class for every hour in class)**.
- You are encouraged to form study groups and visit the Math Lab (Science 26)..

On Getting Through the Course

- Come to class prepared: review notes, **read book**, do problems.
- You should not miss class if at all possible. However, if you must, a pdf of the notes for the missed class will usually be posted. Make use of those postings when needed.
- **Ask** questions **DURING** class: if you're confused, seek clarification. One of the things I get paid for is answering your questions.
- **Answer** questions **DURING** class. Lead group discussions and help others: tell us what you've learned and let us learn from you.
- Study in groups as **SOON** after class as possible: help -- but don't copy from each other ...we call that plagiarism and the results of that are undesirable.

Learning Outcomes

The **Mathematics Department** has identified the following five learning outcomes to be achieved by majors and minors in its program.

1. Students will read and understand mathematics, differentiating between correct and incorrect mathematical reasoning. (Reading, listening, following discussions).
2. Students will effectively communicate mathematics to others, both in writing and speaking. (Presentations and written work)
3. Students will demonstrate abilities to work independently and in-groups to develop mathematical models using appropriate technologies.
4. Students will demonstrate mastery of the content of the course. (Quizzes and exams)

Disability Accomodation

Diversity and Disability Statement: Our institution values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify the instructor as soon as possible. Students with disabilities are also welcome to contact the Office of Accessibility (517) 264-7683 or Laura Lyall (coordinator) at llyall@sienaheights.edu to discuss a range of options to removing barriers in the course, including accommodations. This process is initiated and driven by the student. It is to your advantage to begin the process in a timely manner, since accommodations are not retroactive. Grades earned before verification of a disability by the Office of Accessibility will not be changed.