MATH 4023
Fall 2010 Course Information

Instructor

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Course Times:
MWF 10:30 am - 11:20 am.

On Monday and Wednesday of each week new material will be introduced. Friday of each week, will be dedicated to discuss problems solutions. Students will be encouraged to present solutions and or ideas to solve problems. The instructor will not solve homework problems in class.

Text

Elementary Analysis: A theory of Calculus; by Kenneth Ross. The first weeks of class I will cover concepts from Logic and Set Theory. I will provide notes on these topics.

To succeed in this class, it is essential that you attend regularly, attempt all suggested homework problems, seek help when cannot understand a topic and work through the sections of the textbook that are discussed in class. There is too much material for me to be able to cover every detail in my lecture, but you are responsible for learning everything of the sections that is discussed in class.

Homework:

Homework will be assigned weekly. All homework sets will be collected and selected problems will be graded. Graded homework will be returned within a week. Please read the attached suggestions on how to study math before attempting to do the homework.

Course Requirements

The requirements for this course are as follows:

1. Homework, worth 100 total points.

2. Three in-class exams are worth 100 points each, and will be given on the following days: Friday, September 10; Friday, October 15 and Monday, November 15.

3. A comprehensive final exam will be given on Friday, December 17, from 8:00-9:50 am, will be worth 150 points.

If you have a pre scheduled and unavoidable conflict on the date of an exam then you should let me know beforehand so that appropriate arrangements may be made. If you miss an exam for good reasons that are both unpredictable and beyond your control and you wish to make the exam up then you must contact me as soon as possible.

Grading:

The total score, T, in the class (out of 450 points) will be determined according to the formula

$$T = H + E1 + E2 + E3 + F - MIN(H, E1, E2, E3),$$

where H is the homework score, E1,E2,E3 are the in-class exam scores, F is the final exam score and Min denotes the minimum. An overall score of 90% or more will ensure and A, a score between 80% and 89% will ensure a B, a score between 70% and 79% will ensure a C, and score between 60% and 69% will ensure a D.

Please observe that you need at least 405 points to get an A. Please note that even if you accumulate 300 points during the semester you need to make 105 points in the final in order to get an A.

Partial Credit: On homework there will be little, if any, partial credit. On exams the amount of partial credit will depend on how much of a problem you do correctly. On both homework sets and exams it is **extremely important** that you write down logically justified steps involved in getting your answer, not just the final answer, in order to get any credit.

Makeup Exams:

Makeup exams will be given **only** for very serious and unavoidable extenuating circumstances and only if you notify me one week in advanced. Medical reasons should be supported by a doctor certificate.

Incomplete:

A grade of I is given to a student who satisfactorily completes the majority of the course work, whose work average is a D or better, and who has been unavoidably prevented from completing the remaining work of the course. The maximum time allowed for a student to remove a grade of I is one calendar year. A student who may need to receive an Incomplete must contact the instructor. An Incomplete is not automatically given.

Academic Integrity:

Oklahoma State University is committed to the maintenance of the highest standard of integrity and ethical conduct of its members. This level of ethical behavior will be maintained in this course. participating in a behavior that violates academic integrity will result in your being sanctioned. These behaviors include, but are not limited to unauthorized collaborations and plagiarism; unauthorized advance access to examinations, cheating on examinations, or helping another person cheat; altering or destroying the work of others or fraudulently altering academic records.

With regard to the homework you should note that I encourage the formation of groups and the discussion of homework solutions. However, you must write up your own homework solutions yourself. The following are not permitted:

1. Showing your written homework solutions to another student;

2. Reading another student's written homework solution;

3. Writing a solution to a homework problem jointly with another student and then both students copying that solution onto their own paper;

4. Reading homework solution written by faculty or students in other semester snf/or at other universities, including posted solutions on the internet or in the instructor solution manual.

1 How to study Math? Some suggestions

• **Definitions** are exceedingly important. They prescribe the meaning of mathematical objects in a very specific way. Definitions provide the language for all we do. A definition gives a small amount of structural information that it is enough to determine a concept. It is impossible to do mathematics if we do not have a precise understanding of the objects we work with.

First thing to do: Learn the definition of each concept introduced in the course. This means memorize and understand the definitions. The wording use in a definition is precise and meaningfull. For example, we will study the definition of a continuous function. You should be able to give examples of functions that are continuous and examples of functions that are not. You should be able to explain why a function is or not continuous by checking if the definition of continuity is satisfied or not.

•**Theorems** (propositions and lemmas) are true statements about a concept. Theorems have precise hypothesis and precise thesis. (Be careful when reading a Theorem, if the hypothesis states that something holds on an open interval (a,b), modifying the statement to a closed interval [a,b] might make the thesis meaningless or incorrect).

Second thing to do: Learn and understand the Theorems. You need to know the hypothesis (this will tell you when the thesis will hold and when to use the theorem). You need to know the thesis. You need to READ AND UNDERSTAND the proofs of the theorems. When reading a proof you should ask yourself what is the main idea used to derived the thesis. Is the definition used in the process of proving the theorem?. Observe how the author argues logically to justify each claim.

The main goal of this course is to WRITE CORRECT PROOFS of true facts about functions of one variable. Understanding the proofs of the theorems is crucial to learn how to write your own proofs.

• **Examples**
Third thing to do : Prepare three lists. One list that includes all definitions. A second list that includes all theorems. A third list that consists of examples that illustrate theorems and definitions, as well as examples that illustrate the necessity of the hypothesis of theorems.

About homework and lectures

(1) Read each section before we cover it in class. Try to get the main idea of the section.

(2) Before trying to work on the homework, read the material covered. Concentrate on the definitions, examples and statements of the theorems. Close the book and write down the definitions and theorems of the section. Then read the proves of the theorems following the suggestions of step 2. Close the book, write down the proof of a lemma in the section. Give examples as indicated in step 3. This can take 2 hours.

(3) Do the homework. You need scratch paper as you make various attempts. You will need to think of the various type of proofs (induction, contradiction, etc). Once you think you have a proof constructed, start at the beginning and write a systematic proof. When you are done with the proof, read it carefully. Does everything you wrote make sense? Does you proof proves what is suppose to prove? Is it easy to read or is it confusing? Is every step justified?. It is important to go back to the text and read again if you are having problems with some homework problems.

NOTE : If you think that you will not have the time to do all of the above due to your schedule, then it might not be the right semester to take this course.