

MATH 113-03: PRECALCULUS
RAUB 405: TR 2:10-3:25 (3 credits)

Professor: Steve Williams
Office: ROBI 405 ext 2275

E-mail: swillia6@lhup.edu (don't forget the 6)
Office Hours: MWF: 11:15 – 12:15
TR: 12:00 – 1:00

I. CATALOG COURSE DESCRIPTION:

The major topics are: functions, polynomials, exponentials, logarithms, and trigonometric functions. This material is treated in the modern spirit with emphasis placed on both the development of pertinent concepts as well as the acquisition of essential techniques. The presentation of the topics is balanced between theory and application. Although some treatment of the real numbers is included, the principal mathematical structure involved is the set of rational numbers and its subsets. **Prerequisite:** MATH112 or placement by the Department of Mathematics. **Fulfills General Education Requirements.**

II. PREREQUISITE KNOWLEDGE:

In order to be successful in this course, students should already be proficient in the use of algebra to solve problems. Prepared students will have a thorough understanding of the rules for operating on algebraic expressions and the justification for these rules. Students will also be proficient at working with first- and second-degree equations, as well as have experience with higher order polynomial equations. It is also expected that all students are familiar with the general nature of functions, as this course will more closely examine specific functions, how they change, and how they can be applied to different areas of life. Furthermore, it is also expected that students have a general understanding of how to use the graphing calculator (although, this knowledge will be taught in depth as we go through this course). A thorough understanding of high school Algebra II or college-level Intermediate Algebra is required.

III. COURSE OBJECTIVES/GOALS:

In general, the objective of this course is to provide the student with an in depth understanding of the function concept and a foundational understanding of the way in which different types of functions change. These understandings are essential for success in Calculus. Students will be expected to demonstrate an understanding of Precalculus beyond the manipulation of symbols, apply Precalculus to practical problems, and use current technology throughout the course. More specifically, students in this course will:

1. develop an in depth understanding of the function concept through the graphical, tabular, symbolic, and verbal representations of functions.
2. develop an understanding of the concept of change, with respect to different types of functions and the consequences of various rates of change.
3. study the properties of polynomial, exponential, logarithmic, and trigonometric functions.
4. investigate applications of polynomial, exponential, logarithmic, and trigonometric functions.
5. fit various functions to given data.
6. use graphing technology as a tool to help analyze functions and their behavior.

IV. TEXT:

Functions Modeling Change: A Preparation for Calculus
2nd Edition (2004), John Wiley and Sons. ISBN #: 0471-45653-5

V. MATERIALS NEEDED: (note that a graphing calculator in the TI-83 family is required for this course)

Text, notebook and paper, pencils (graded work must be done in pencil, or typed, to receive full credit), TI-83 family graphing calculator, graphing paper, straight edge, access to computer with internet.

MY PHILOSOPHY ON GRAPHING CALCULATOR USE FOR THIS COURSE:

You must have a graphing calculator for this course. The power of visualization given by it is invaluable for a course such as this. We will constantly be using them in class. The intention is not so you do not have to develop your manipulation skills, rather that the calculator will augment these skills and perform the tedious ones that are not even developing the concepts that are desired. At the same time, you should not rely solely on the calculator and think that it is doing the real math for you. It can only do the tedious calculations and to show you what might not be easily visible without them.

VI. MAJOR UNITS:

1. Functions, Lines, and Change (Chapter 1).
2. Functions, Quadratics, and Concavity (Chapter 2).
3. Exponential Functions(Chapter 3).
4. Logarithmic Functions (Chapter 4).
5. Transformations of Functions and their Graphs (Chapter 5).
6. Trigonometric Functions (Chapter 6).
7. Trigonometry (Chapter 7).
8. Compositions, Inverses, and Combinations of Functions (Chapter 8).
9. Polynomial and Rational Functions (Chapter 9).

VII. EVALUATION

You will have 3-4 tests that will be announced at least one class meeting prior to the test date. You will also have several quizzes that may be announced or unannounced. In addition to these, you will have specific homework Problem Sets that will be graded. You may also be assigned other projects as the course direction dictates. As an instructor who usually takes into consideration his students' needs, the exact date and point-value of each assignment will be determined as the class progresses. The final exam will be cumulative. Note that depending on the direction that the class decides to take, several of the tests and quizzes may be take-home (this is usually determined by my perception of the work ethic and interest of the class as a whole). Your final course grade will be determined by a simple ratio of points earned to points possible, so it should be easy to keep track of your grade throughout the semester. I use rubrics to grade and they will be shared with you as the time arises. The grading scale is as follows: A: 100-91, A-: 90-87, B+: 86-81, B: 80-76, B-: 75-71, C+: 70-66, C: 65-61, C-: 60-56, D+: 55-52, D: 51-49. As this is a very generous grading scale, no negotiating for grades at the end of the semester will be tolerated.

VIII. HOMEWORK:

Homework will be given daily, with few exceptions. Most of this homework will be given in terms of problems/exercises in your text, but some of it may be a reading assignment or other project. Regardless of what the homework is, it is expected to be completed, whether it is graded or not. More often than not, the next class meeting will depend on the last homework assignment.

This means that you will be behind in class if you do not do the homework outside of class. Most of the daily homework assignments will not be graded; rather, you will have in-class quizzes and tests and out-of-class Problem Sets that will be graded. But if you wait until these graded assignments to actually begin studying the material, you will most likely not do very well in this course.

For those problems with which you are having difficulty, you should plan to come see me in my office. We will also be able to go over several problems at various times during class, but please count on spending time in my office going over problems either individually or in small groups. You should always be keeping up with your reading and homework. Near daily activity is strongly advised. You should plan to spend at least six hours each week, outside of class, studying course material. Please make good use of my office hours.

You should immediately form a bond with 3 or 4 other people in this course. You should plan to meet a couple of times a week so you can discuss what is going on in class and can help each other out as needed on the daily homework assignments. Unless otherwise stated, you should work on your Problem Sets together as well. Please be comfortable talking to myself and each other.

IX. READINGS:

My suggestion is to read the text on a chapter by chapter basis and then go back over it and study the individual sections as we go over the topics in class. I believe that it is important to read the entire chapter first so you can see where it is going (especially with this text). I do not usually teach “section by section” throughout a text. Our class time together will mainly be a discussion of the “concepts” and the problems that can be solved with the concepts. The skills will be developed as we need them. In contrast to this, if you only read the text “section by section,” you will not be seeing the entire picture that I am presenting in class. Remember that in mathematics, the “whole is much larger than the sum of its parts.”

X. ATTENDANCE/MAKE-UP WORK:

I see no way of passing this course without attending most every class session, unless you have been misplaced in the course. While I do not factor attendance into the course grade, LHUP does not require professors to provide makeup work for unexcused absences. Therefore, if you miss an assignment due to an unexcused absence, do not expect me to allow you to make it up. If you are absent on a quiz or test day, you cannot make it up. Please see me concerning days you miss. Also, carefully read the class attendance policy in your student handbook. Course materials will be placed on my LHU website by going to www.lhup.edu/swillia6 or following the link in the faculty section of the mathematics department webpage.

XI. ACADEMIC HONESTY:

Please refer to your student handbook so I do not have to deal with this issue during the semester.

XII. SPECIAL SERVICES:

Any student requiring accommodations for taking notes or tests or anything else should make arrangements to discuss his or her needs with me as soon as possible. You must see Dr. Rey Junco on campus to document any special needs. LHUP does not discriminate against those students requiring special services.

XIII. DISTRACTIONS

Try to remember that a cellphone ringing in the middle of class is a distraction to all those around you. Therefore, please turn them off before class begins. If you have an emergency situation that warrants having it on, please keep it on vibrating mode and leave the room when a call comes in. Also, do not listen to headphone music while in class. This shows me that you are not a serious student and that you do not deserve to be in this class. Finally, if your laptop is out, please resist the urge to email or IM people during class. While this is not necessarily a distraction to others, it is a personal distraction to your understanding what is said in class (whether you want to admit it or not).

XIV. OFFICE HOURS

I enjoy helping my students inside and outside of class. My official office hours are posted on my door and are on the front of this syllabus. However, I will be on campus much more often than these times, so please feel free to call or stop by if you need help. Email is always a great way to contact me. If you stop by my office while it is not office hours, I may ask you to wait until I finish what I am doing. Please use me and your group as your best resource for passing this course. The university also offers tutoring for this course for those of you who need regular assistance.

XV. IMPORTANT NOTES

This is not a course in which you will memorize a bunch of terms and formulas and be expected to regurgitate them on tests and quizzes. This course is about solving problems using precalculus techniques. While you will be expected to know terms and be able to do “tedious” exercises, these are only designed to give you the manipulation skills necessary to solve the “conceptual” problems. So try to keep this in mind as we go through this course together. For many of you, this will be a challenge, but I promise you that it will be very rewarding in the end, as you will learn a lot more about mathematics than you ever knew.

Also, keep in mind that the graphing calculator is not expected to do the math for you. It is there to help you see the graphical interpretation of the precalculus concepts you are studying. These two things combined should greatly enhance your understanding of the concepts of this course and adequately prepare you for the study of Calculus.

XVI. FINAL EXAM

The final exam is scheduled for Wednesday, December 16th from 10:00 until 11:50.

GOOD LUCK AND WORK HARD THIS SEMESTER

NOTE: Sign and return the next page of this document

I, _____(print your name) acknowledge that I have received/retrieved a copy of the syllabus for MATH113 and have had the chance to discuss any matters in the document with the professor. Signing this document does not imply that I agree with everything in the syllabus, just that I have received/retrieved a copy of it from the professor or his website.

Signature

Date