Syllabus Math1331- A
Pre-Calculus and Trigonometry
3 credit hours
Fall 2015
Meets MWF 11:10 - 12:00 in Strake 207

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(See instructor’s schedule of office hours on UST Blackboard for this course.)

Course Description
The mathematical techniques which will prepare you to study calculus: working with straight lines, quadratic functions, exponents, logarithms, and trigonometric functions. The purpose of this course is to enhance your ability to work with the specific algebraic and trigonometric concepts needed in calculus.

TEXTBOOK:

This text is required. You cannot succeed in this course without a copy of the text. There will be numerous reading assignments and problem assignments from this text. The edition number is extremely important - problem numbers and section numbers are often changed when authors switch from one edition to another, so you must have the sixth edition.

Rules of Conduct
No cell phones or camera phones are to be used in the classroom. No text messaging (inbound or outbound) is to be done during the class period. Any cell phones brought into the classroom must be set to silent ring. No calls are to be answered in the classroom. If you need to take an important call (use your professional judgment), step into the hallway WITHOUT causing a disruption of the class.

No personal electronic devices (video or audio) are to be used in the classroom. None of the classroom material or discussion is to be recorded (voice or visual) without the express permission of the instructor. This permission will be granted only for documented special needs.

Specifically note that digital photography of materials on the board, placed there by either the instructor or you, is not allowed.
Any exception must be directed to me in writing by the Office of Counseling and Disability Services at the University of St Thomas.

Computers, tablets, calculators, etc.

Laptop computers and tablets are not to be used in class. In a math class there is no effective way to take notes on a laptop or tablet. Of course none of these devices will be allowed in exams.

Calculators

Calculators will be de-emphasized in this course. Calculators have a role, but a rather insignificant role, in preparing you to succeed in the study of calculus. Calculators produce only numbers or pictures, they do NOT produce understanding of mathematical concepts.

Unless otherwise stated, all problems in the homework or on tests must be solved WITHOUT the use of calculators.

In the rare instances when calculators are used, their function will be primarily to perform certain elementary operations:
- addition, subtraction, multiplication, division
- taking the inverse of a value, i.e. $\frac{1}{x}$
- raising a number to a power, for instance $x^2$
- extracting the root of a number, for instance $x^{\frac{1}{2}}$
- finding the logarithm base 10 (log x ) or the natural logarithm base “e” ( ln x )
- finding the anti-log of a given logarithm
- finding the values of the trigonometric functions of an angle: sin x, cos x, tan x
- finding certain values for the inverse trigonometric functions

In those few instances where calculators are used in this course they are NOT to be used automatically to produce graphs. If you have a graphing calculator, or are looking ahead to other courses in which a graphing calculator will be used, it is permissible to use the arithmetic and trigonometric functionality of that calculator, but NO results using the graphing features of that calculator will be credited in this course, either in homework or in testing.

All graphs must be developed from a handful of strategically chosen calculated pairs of coordinates and freehand-sketched.

Topics to be covered (the order of presentation may be changed during the semester)

Working with straight lines.
1. Graphing a linear function by hand
   - Domain and range of a linear function; special cases of these
   - Equation of a linear function from given points on its graph
   - y-intercept of the graph of a linear function
Graph of a straight line, given a point and the slope of the line
Written problems involving linear functions
2. Two points determining a straight line
   Point and a slope determining a straight line
3. Word problems:
   Proceeding from a graph describing the situation to an equation
   Proceeding from a written definition of the problem to an equation
   Using the graph to answer specific questions about the application
4. Solving a linear equation analytically
   Intersection of graphs of two (not necessarily linear) functions, and supporting the result graphically.
5. Pairs of linear equations with either no common solution or no unique solution.
6. Working with piece wise-defined functions.
7. Stating explicitly where a function is increasing and decreasing
   The open dot vs. the closed dot representation on the graph of a piece wise-defined function
   Equations and inequalities involving absolute values
8. Word problems involving piece wise-defined functions

**Working with quadratic functions.**
9. Graphs of some quadratic functions
   Finding the vertex of a parabola, and using it to graph the parabola
10. Word problems involving quadratic functions
11. Solving quadratic equations
12. Word problems involving areas, volumes, and finance
13. Higher degree polynomials, e.g those involving $x^3$, …
14. Fitting quadratic functions to given data points.

**Working with exponents and logarithms.**
15. Exponents on a variable, and their meaning
   Solving exponential equations
16. Compound interest and the special constant $e = 2.71828…$
17. Logarithms
   Functions of logarithms, logarithms of functions
   Various bases for logarithms
   $\log x$ vs. $\ln x$
Inverse functions
   $\ln x$ vs. $e^x$
18. Solving equations in exponents and logarithms.
   Word problems involving logarithms and exponentials.

**Working with trigonometric functions.**
19. Definitions of $\sin$, $\cos$ and $\tan$
   Graphs of these functions
   Applications of these functions
   Inverse trigonometric functions: Given a result, what are the possible values of
which could have been the origin of the given value of the \( \sin x \), etc.

20. The remaining three trigonometric functions cot, sec and csc

**NOTE TAKING AND NOTEBOOKS**

Maintain an 8 ½ by 11 inch 3-ring loose-leaf notebook for this course. Do not use a bound notebook. There are times when you may need to replace some work you have done on a problem with an updated, or better organized, version.

I **strongly suggest you take notes** in class. (There will always be concepts you need to review, and details you need to refer back to when doing homework assignments.) Keep these notes in your loose-leaf notebook. Also file all your homework problems in this loose-leaf notebook. Be sure NOT to write class notes and homework solutions on the same physical piece of paper, since at various times during the semester I may ask you to remove certain homework solutions from your notebooks and hand them in.

**ASSIGNMENTS**

Whether or not a written assignment is collected, you will be responsible for knowing how to do the problems or similar problems on a short quiz or full period exam. Each student should complete his/her own assignment. This will pay off in quizzes and exams.

Some homework problems will be worked in class.

I encourage students to work together on the homework assignments (this does NOT mean copying from each other, rather, helping each other to learn the concepts and procedures for problem solving).

You can get help with any other problems during my office hours, or by phone and e-mail.

For each problem you do and insert into your notebook, be sure to identify the page number and problem number. This will also help you to keep your course notes organized. For more detailed guidelines see the separate document “Submitting Professional Quality Work” also on the UST Blackboard system for this course.

In grading your exams and quizzes I will put a **high premium on the organization** within each solution as well as on the logical and orderly presentation of details.

**Academic Dishonesty**

Students are expected to conduct themselves in an ethical manner at all times.

The exams and any short quizzes will be closed book determinations of what material has been retained, and what skills have been learned. These will be **individual** efforts.

“The penalty for an incident of academic dishonesty is, at the discretion of the faculty member, either a mark of zero for the work in question or the grade of “F” for the course.” [see the University of St Thomas website **www.stthom.edu**; search the website for “dishonesty”].
Again, note the distinction between completing a homework paper and learning a skill.

**Availability of instructor**

See the separate spreadsheet, available on the UST Blackboard system, for the schedule of my office hours. Individuals or groups of students can ask questions and get help with concepts and problems. No appointment is necessary. This is one of the advantages of the small class sizes at the University.

If you have a question and cannot get to my office during my scheduled hours you may call my residence, 713-784-9286 or my office, 713-525-3865 any time between 8:00 in the morning and 10:30 in the evening, including weekends. Refer to my schedule to determine which number to call at a specific time.

If you need to leave a message on either phone, clearly indicate your name, the class you are in, the number to which I should return your call, and any limits on the hours during which I may return your call.

**Tutoring**

Free tutoring by advanced level students in the math department (math majors) will also be available shortly after the start of the semester. These tutoring sessions will be held a few afternoons a week in the math department conference room, second floor of the Math house. I will announce specific times later. You can either get help directly from me during office hours or from one of these tutors, whichever works for you.

Tutoring in mathematics is also available at certain specific hours in the Tutoring Center (second floor, Crooker). The schedule will be announced later.

**WEB ACCESS**

Occasionally during the semester I will need to send handouts to each member of the class. They will be sent to you at your “…@stthom.edu” e-address which is registered in the Blackboard system. You have the option of setting your e-mail to be forwarded automatically from Blackboard to an e-address of your choice.

Certain materials for the class will be posted on UST’s Blackboard computer system. You have two responsibilities with respect to this system:
1. to check the system periodically to see what assignments and/or supplemental materials have been posted
2. to keep your preferred e-address up to date in the Blackboard system list so that you can receive occasional e-mails which I broadcast to the entire class via this list.

You also have the responsibility to check your e-mail for any special announcements regarding this course. I occasionally respond to the whole class about questions raised by individuals - I do not identify the individual who raised the question, so do not hesitate to ask questions by phone or e-mail.
READING FILES OF ASSIGNMENTS AND HANDOUTS
At whatever computer (your own, or a University computer) or tablet, etc. you use, you will need to be able to read files in *.pdf (Adobe Acrobat) format.
A free copy of the Adobe Acrobat Reader can be downloaded from Adobe.com.

GRADING

Computing your grade
Attendance/Participation and Homework    5%
Major Exams and occasional short quizzes 75%
COMPREHENSIVE Final Exam               20%

No one will be excused from taking the final exam. Since the final exam will be comprehensive, it will force each student to synthesize the materials in the entire course.

There will be at least three, possibly four or more, major exams during the term. There may also be some short quizzes (I reserve the right to give unannounced quizzes as well as announced quizzes). I usually post the date of each major exam one week before that exam.

If you know you will need to miss, or have missed an exam or quiz, communicate this to me by phone or e-mail. Missed exams or quizzes without communication of a valid timely excuse will result in a grade of zero. (I will judge the validity.)

Although many homework problems will be assigned during the semester, your homework will usually NOT be collected. Instead I test for the skills you attained while doing this homework. Specifically, you will demonstrate these skills in individual testing on similar problems in the major exams and short quizzes.

GRADING SCALE:
93-100 A
90-92.9 A-
87-89.9 B+
83-86.9 B
80-82.9 B-
77-79.9 C+
73-76.9 C
70-72.9 C-
67-69.9 D+
60-66.9 D
<60 F

Exams and quizzes refer to closed book, in-class, testing over the material covered.
The instructions in each individual quiz and exam will indicate clearly whether or not a calculator is allowed.
Disabilities
The University Office for ADA Compliance may ask to see proof of disability and then specify appropriate accommodating factors. Students with special needs should inform the instructor immediately since the course materials are cumulative. Students must also contact the Office of Counseling and Disability Services (2nd floor of Crooker Center) by calling Dr. Rose Signorello at 713-525-3162 or Ms. Debbie Jones at 713-525-6953; the Office is open 8-5 Monday through Friday.

Any accommodations will become active when the instructor receives written notification from the official in charge of ADA compliance. Students should contact the instructor immediately if new needs arise. Students can see the instructor before or after class or request another time to discuss any matters. All information will be kept confidential.

As an instructor, I am neither qualified nor allowed by the University to authenticate a claim of a disability requiring special accommodations. Please seek accommodations for a disability within a few days of the start of class. The material in this course is highly cumulative, so the longer you wait the more difficult it will be to obtain effective assistance.

Again, if you have questions or concerns regarding the accommodation process, please call Debby Jones or Rose Signorello at ext. 6953 or 3162 at Counseling and Disability Services.