Fall 2015: Math 1451-002/002a Calculus I

Instructor: Dr. Alexander Solynin	**Place:** MA 111
Office Hours: MW 2:00-4:00 T 1:00-3:00 or by appointment	**Text:** *Calculus*, 6th Edition by Smith/Strauss/Toda
Office: MA 231	**Time:** 9:00-9:50 MWF & 8:00-8:50 M
Phone: 834-7280	**Prerequisites:** See below
Email: alex.solynin@ttu.edu	**Website:** None

About the Course: We will cover **Chapters 1 – 5.** The goal here is developing the student's geometric insight into the concepts of differentiation and integration, and applying these concepts to problem solving and "real world application".

Prerequisite: MATH 1350 or 1550 with a grade of C or better, or MATH 1321 with a grade of C and Code 5 on MPE, or MATH 1321 with a grade of B or better, or Code 7 on MPE, or a score of at least 660 on the SATM, or a score of at least 29 on the ACTM, or a score of at least 3 on AP AB Calculus and Code 5 on MPE.

Instructor's Note: I strongly recommend taking **Trigonometry Class** before students take Calculus I class. Without some knowledge of basic Trigonometry this class will be difficult.

Learning Procedures: Students have to read scheduled sections before the class. After a particular section is covered in class, students have to read it once more and do homework assignments for this section.

Calculators: Graphing calculators are allowed and may be useful in class. **Calculators are NOT ALLOWED on the Final, in-class Exams, and Quizzes.** Time will not be spent in class on calculator instruction.

Formula sheets: Formula sheets are NOT ALLOWED for the Departmental Common Final! But for in-class exams, at least one class before each in-class exam, I will provide students with a page, valid for that particular exam, where you may write (do not type!) formulas and theorems, which you are going to use in class. Students are not allowed to use their own pages as formula sheets in class!

Expected Student Learning Outcomes: Upon successful completion of this course, students will become proficient in techniques of differentiation, understand the concept of rate of change and how to use it to solve real world problems, the concept of definite and indefinite integral and their relations to area and rate of change. In particular, the students will be able to

1. Explain the concepts of limits and continuous functions;
2. Compute derivatives of basic algebraic and transcendental functions;
3. Compute instantaneous rate of change;
4. Compute differentials and find linear approximation of functions;
5. Use differentiation to solve basic optimization problems;
6. Compute definite and indefinite integrals.

Methods for Assessment of Learning Outcomes: The expected learning outcomes for the course will be assessed through graded activities and ungraded activities. The graded activities include exams, homework, and quizzes. The ungraded activities will be used to monitor your progress. A variety of these ungraded assessment techniques may be employed, including problems to be completed during class, direct

questioning of students, answering students questions in class, one-minute classroom assessment techniques, and discussions during office hours.

General Policies:
In general, no missed in class exams and quizzes will be made up and no homework will be accepted after the deadline. Whether an absence is excused or unexcused is determined solely by the instructor with the exception of absences due to religious observance and officially approved trips described below.

Students with Disabilities: Any student who because of a disability may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary accommodations. Students should present appropriate verification from AccessTECH. No requirement exists that accommodations be made prior to completion of this approved university procedure.

Absence due to religious observance: The Texas Tech University Catalog states that a student who is absent from classes for the observance of a religious holy day will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. Notification must be made in writing and delivered in person no later than 15th class day of the semester.

Absence due to officially approved trips: The Texas Tech University Catalog states that the person responsible for a student missing class due to a trip should notify the instructor of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missed.

Academic Integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. There will no tolerance for cheating or plagiarism. Texas Tech University policies will be enforced in such cases.

Important Dates:
Thursday, August 27 - Last day to add a course.
Monday, September 7 - Labor Day.
Wednesday, September 9 - Last day to drop a course without Academic Penalty.
Monday, September 21 - Last day to withdraw and receive a partial refund.
Monday, October 26 - Last day to drop a course with Academic Penalty.
Wednesday - Sunday, November 25-29 - Thanksgiving Vacation.
November 23 - December 2 – Period of no examinations.
Wednesday, December 2 - Last Day of classes.
Wednesday, December 9 - 4:30 p.m. – 7:00 p.m. Final Exam.

STUDENT EVALUATION:

♦ **Wednesday, December 9 FINAL EXAMINATION 4:30 p.m. – 7:00 p.m.** **200 pts**
This is a **Departmental Common Final Exam written by the Course Coordinator.**
Exam is scheduled before the semester begins. Date and time of this exam **cannot be changed!**
Students should **eliminate any conflicts NOW!!!**
Room for the Final Exam will be announced later.

- **IN-CLASS EXAMS:** September 28, October 28, November 18 **3×100 = 300 pts**
  Each exam consists of 8-12 problems
- 15 min **QUIZZES**: **6×20 = 120 pts**
  Each 15 minute quiz consists of 2 problems**:** 2×10 = 20 pts

- 5 min **QUIZZES**:
  There will be several 5 minute quizzes (usually first 5 minutes of a class), total = **30 pts**
  where students will be asked to write a particular formula/definition/theorem/etc.
- **HOMEWORK**: I will collect homework eight times – approximately every
  third class and I will grade 8-15 problems of these homework assignments.
  Each homework is worth 15 pts: **8×15 = 120 pts**
- **Perfect attendance** ($\leq$ 4 missed classes,
all excused absences must be supported by official notes). **30 pts**

- **MAXIMAL TOTAL (100%): 800 pts**

GRADING PROCEDURE:

A - 90 - 100%
B - 80 - 89%
C - 70 -79%
D - 60 - 69%
F - ≤ 59%

Course Calendar

Date	Textbook	Tentative Lecture Topics
Aug. 24	Sections 1.1 & 1.2	What is Calculus? Preliminaries.
Aug. 26	Section 1.3	Lines in the plane.
Aug. 28	Section 1.4	Functions and graphs.
Aug. 31 **Q1**	Section 1.5	Inverse functions.
Sep. 2	Section 2.1	The limit of a function.
Sep. 4	Section 2.2	Algebraic computation of limits.
Sep. 9	Section 2.3	Continuity.
Sep. 11	Section 2.4	Exponential and logarithmic functions.
Sep. 14 **Q2**	Section 2.4	Exponential and logarithmic functions.
Sep. 16	Section 3.1	An introduction to the derivative. Tangents.
Sep. 18	Section 3.1	An introduction to the derivative. Tangents.
Sep. 21	Section 3.2	Techniques of differentiation.
Sep. 23	Section 3.3	Derivatives of trig., exponential and log. functions.
Sep. 25	Section 3.3	Derivatives of trig., exponential and log. functions.
Sep. 28	**Lecture Exam #1**	**covered Sections 1.1 – 3.3.**
Sep. 30	Section 3.4	Rates of change. Rectilinear motion.
Oct. 2	Section 3.5	The chain rule.
Oct. 5 **Q3**	Section 3.5	The chain rule.
Oct. 7	Section 3.6	Implicit differentiation.
Oct. 9	Section 3.7	Related rates.
Oct. 12	Section 3.8	Linear approximation and differentials.
Oct. 14	Section 4.1	Extreme values of a continuous function.
Oct. 16 **Q4**	Section 4.1	Extreme values of a continuous function.

Oct. 19	Section 4.2	The mean value theorem.
Oct. 21	Section 4.3	Sketching the graph of a function.
Oct. 23	Section 4.3	Sketching the graph of a function.
Oct. 26	Section 4.4	Curve sketching with asymptotes.
Oct. 28	**Lecture Exam #2, covered Sections 3.4 – 4.4.**	
Oct. 30	Section 4.5	L'Hopital's rule.
Nov. 2 **Q5**	Section 4.6	Optimization in physical sciences, etc.
Nov. 4	Section 5.1	Antidifferentiation.
Nov. 6	Section 5.2	Area as the limit of a sum.
Nov. 9	Section 5.3	Riemann sums and the definite integral.
Nov. 11	Section 5.4	The fundamental theorem of calculus.
Nov. 13 **Q6**	Section 5.5	Integration by substitution.
Nov. 16	Section 5.5	Integration by substitution.
Nov. 18	**Lecture Exam #3, covered Sections 4.5 – 5.5.**	
Nov. 20	Section 5.7	The mean value theorem for integrals.
Nov. 23	Section 5.8	Numerical integration.
Nov. 30	Review of the course.	
Dec. 2	Review of the course.	
December 9	**Wednesday 4:30 p.m. – 7:00 p.m.**	**FINAL EXAM**

Tentative Homework Assignments

Section	Assignment
HW1	
1.2	2,4,10,12,18,24,28,34
1.3	2,6,8,10,14,20,24,28,30,32
1.4	2,6,10,12,18,20,28,34,38,42
HW2	
1.5	8,12,16,18,20,24,28
2.1	6,8,14,16
2.2	4,8,10,12,16,20,26,40
2.3	8,10,14,16,22,28
HW	
2.4	2,12,18,22,28
3.1	12,18,22,30,36,42
3.2	6,8,16,20,24,30,42,46
HW4	
3.3	2,8,10,24,32,40,46,52
3.4	6,8,18,22,40
3.5	4,6,18,24,32,42,58
3.6	2,6,32,34,38,44,46

HW5	
3.7	2,6,26,42
3.8	2,10,18,22,30
4.1	2,6,8,12,20,30,36
HW6	
4.2	4,8,14,16,22,34,40,56
4.3	12,16,20,26,30,32,40,42,44
4.4	8,12,20,22,26,34,44
HW7	
4.5	2,4,8,12,20,26,30,38,40
4.6	2,6,10
5.1	2,4,8,12,14,18,24,30
5.2	2,4,12,14,20,24,30
HW8	
5.3	2,4,18,28
5.4	2,4,8,16,20,22,26,30,34,38,52
5.5	4,10,18,22,30,34,36,44
5.7	2,6,8,18,22,34
5.8	12,16