Fall 2017: Math 1451-H02/H02a Calculus I

Instructor: Dr. Alexander Solynin	**Place:** MATH 012 T & MATH 012 TR
Office Hours: MW 2:00-4:00 or by appointment	**Text:** *Calculus*, 7th Edition by Smith/Strauss/Toda
Office: MA 231	**Time:** 11:00-11:50 T & 12:30-1:50 TR
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: At least a C in MATH 1350 or 1550, or 7 on MPE, or B in MATH 1321, or C in 1321 with 5 on MPE, or 660 on SATM, or 29 on ACTM, or 3 on AP AB Calculus with 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!

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, quizzes, and research papers. 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.

***Absence due to religious observance*:** The Texas Tech University OP 34.19 states that a student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. As your instructor, I request that notification be made in writing and submitted no later than the 15th class day of the semester. Absence due to officially approved trips - The Texas Tech University OP 34.04 states department chairpersons, directors, or others responsible for a student representing the university on officially approved trips must notify the student's instructors of the departure and return schedules. The instructor so notified must not penalize the student, although the student is responsible for material missed. Any student absent because of university business must be allowed to make up missed work within a reasonable span of time or have alternate grades substituted for work due to an excused absence. Students absent because of university business must be given the same privileges as other students.

***Academic Integrity* (extracted from OP 34.12):** It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.
Scholastic dishonesty includes, but it not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

Civility in the Classroom: Incivility is any action that interferes with the classroom learning environment. This includes, but is not limited to, eating, arriving late, leaving early, a ringing cell phone, text messaging, sleeping, chatting during class, dominating the class discussion by not allowing other students to speak, and putting books away before the end of class. Be respectful to the instructor and to your fellow students. I will ask anyone participating in what I perceive to be inappropriate behavior to stop immediately.

***Accommodation for Students with Disabilities* (extracted from OP 34.22):** Any student who, because of a disability, may require some special arrangements in order to meet course requirements should contact the instructor as soon as possible to make the necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until the appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405.

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.

Title IX Syllabus Statement - TTU Resources for Discrimination, Harassment, and Sexual Violence:
Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and/or sex discrimination of any kind. Sexual assault, discrimination, harassment, and other Title IX violations are not tolerated by the University. Report any incidents to the *Office for Student Rights & Resolution*, (806)-742-SAFE (7233) or file a report online at titleix.ttu.edu/students. Faculty and staff members at TTU are committed to connecting

you to resources on campus. Some of these available resources are: **TTU Student Counseling Center,** 806-742-3674, https://www.depts.ttu.edu/scc/ *(Provides confidential support on campus.)* **TTU Student Counseling Center 24-hour Helpline**, 806-742-5555, *(Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.)* **Voice of Hope Lubbock Rape Crisis Center**, 806-763-7273, voiceofhopelubbock.org *(24-hour hotline that provides support for survivors of sexual violence.)* **The Risk, Intervention, Safety and Education (RISE) Office**, 806-742-2110, rise.ttu.edu *(Provides a range of resources and support options focused on prevention education and student wellness.)* **Texas Tech Police Department**, 806-742-3931, http://www.depts.ttu.edu/ttpd/ *(To report criminal activity that occurs on or near Texas Tech campus*.)

Important Dates:
Monday, August 28 – Classes begin.
Thursday, August 31 - Last day to add a course.
Monday, September 4 - Labor Day. University holiday.
Wednesday, September 13 - Last day to drop a course without academic penalty.
Monday, September 25 - Last day to withdraw and receive a partial refund.
Monday, October 30 - Last day to drop a course.
Wednesday - Sunday, November 22-26 Thanksgiving holiday.
November 30 - December 6 – Period of no examinations.
Wednesday, December 6 - Last Day of classes.
Friday, December 8 - 4:30 p.m. – 7:00 p.m. Final Exam.
December 18 (Noon!) - Final Grades Due via Raiderlink.

STUDENT EVALUATION:

♦ **Friday, December 8 FINAL EXAMINATION 4:30 p.m. – 7:00 p.m.** **230 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 26, October 26, November 28 **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 = **40 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** (≤2 missed (long) classes, all excused absences must be supported by official notes). **30 pts**

- **MAXIMAL TOTAL (100%):** **840 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. 29	Sections 1.1 & 1.2	What is Calculus? Preliminaries.
Aug. 31	Sections 1.3 & 1.4	Lines in the plane. Functions and graphs.
Sep. 5 **Q1**	Section 1.5	Inverse functions.
Sep. 7	Sections 2.1 & 2.2	The limit of a function. Algebraic computation of limits.
Sep. 12	Sections 2.3 & 2.4	Continuity. Exponential and logarithmic functions.
Sep. 14 **Q2**	Section 3.1	An introduction to the derivative. Tangents.
Sep. 19	Section 3.2	Techniques of differentiation.
Sep. 21	Section 3.3	Derivatives of trig., exponential and log. functions.
Sep. 26	**Lecture Exam #1**	**covered Sections 1.1 – 3.3.**
Sep. 28	Section 3.4	Rates of change. Rectilinear motion.
Oct. 3	Section 3.5	The chain rule.
Oct. 5 **Q3**	Section 3.6	Implicit differentiation.
Oct. 10	Sections 3.7 & 3.8	Related rates. Linear approximation and differentials.
Oct. 12	Section 4.1	Extreme values of a continuous function.
Oct. 17 **Q4**	Section 4.2	The mean value theorem.
Oct. 19	Section 4.3	Sketching the graph of a function.
Oct. 24	Section 4.4	Curve sketching with asymptotes.
Oct. 26	**Lecture Exam #2,**	**covered Sections 3.4 – 4.4.**
Oct. 31	Section 4.5	l'Hopital's rule.
Nov. 2	Section 4.6	Optimization in physical sciences, etc.
Nov. 7 **Q5**	Section 5.1	Antidifferentiation.
Nov. 9	Section 5.2	Area as the limit of a sum.
Nov. 14	Section 5.3	Riemann sums and the definite integral.
Nov. 16 **Q6**	Section 5.4	The fundamental theorem of calculus.
Nov. 21	Section 5.5	Integration by substitution.
Nov. 28	**Lecture Exam #3,**	**covered Sections 4.5 – 5.5.**
Nov. 30	Section 5.7 & 5.8	The mean value theorem for integrals. Numerical integration.
Dec. 5	Review of the course.	

December 8 Friday 4:30p.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	2,6,8,10,20,24,28,30
1.4	2,6,10,12,18,28,34,38
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
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	12,16,20,26,30,40,42
4.4	8,12,20,22,26,34,44
HW7	
4.5	2,4,8,12,20,26,30,38
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	2,4,8,16,22,26,30,38,52
5.5	4,10,18,22,30,34,36,44
5.7/5.8	2,6,18,22,34 / 12,16