Texas Tech University, Department of Mathematics and Statistics
MATH 4351, ADVANCED CALCULUS II
COURSE SYLLABUS, Spring 2016
Section #001 (CRN: 27550)

Instructor

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Weekly meeting

TR 09:30am-10:50am, room Math 110

Textbook

Introduction to Real Analysis, by R.G. Bartle and D.R. Sherbert, Wiley. Chapters 6 - 11.

Expected Student Learning Outcomes

Students learn how to think and reason abstractly in the context of analysis of the real line, and learn how to write correct and clear mathematical arguments in this context. There will be a heavy emphasis on proofs, especially epsilon-delta proofs. Concepts and skills to be mastered by the students include but are not limited to: L'Hospital's Rules, Taylor's Theorem, the Riemann integral, sequences of functions, infinite series, introduction to the topology of the real line, introduction to Lebesgue measure and integration.

Course outline

Differentiation (Chap. 6)
    (6.1) The Derivative (6.2) The Mean Value Theorem (6.3) L'Hospital's Rules (6.4) Taylor's Theorem
The Riemann Integral (Chap. 7)
    (7.1) Riemann Integral (7.2) Riemann Integrable Functions (7.3) The Fundamental Theorem (7.4) The Darboux Integral (7.5) Approximate Integration
Sequences of functions (Chap. 8)
    (8.1) Pointwise and Uniform Convergence (8.2) Interchange of limits (8.3) The Exponential and Logarithmic Functions (8.4) The Trigonometric Functions
Infinite Series (Chap. 9)
    (9.1) Absolute Convergence (9.2) Tests for Absolute Convergence (9.3) Tests for Nonabsolute Convergence (9.4) Series of Functions
The Generalized Riemann Integral (Chap. 10)
    (10.1) Definition and Main Properties (10.2) Improper and Lebesgue Integrals (10.3) Infinite Intervals (10.4) Convergence Theorems
A glimpse into topology (Chap. 11)
    (11.1) Open and Closed Sets in $\mathbb{R}$ (11.2) Compact Sets (11.3) Continuous Functions (11.4) Metric Spaces

Assessment of Learning Outcomes

Homework

It will be assigned on a regular basis. It must be completed before the given deadline. Homework is worth **25%** of the final grade.

Examinations

- Exam #1: **Thursday, March 3**, worth **25%** of the final grade
- Exam #2: **Thursday, April 21**, worth **25%** of the final grade
- Final Exam: **Friday, May 13, 7:30am-10:00am, room Math 110**, worth **25%** of the final grade

Use of calculators in all the exams is not permitted. Electronic devices which can store formulas, including cell phones, must be turned off and stored during the exams. The instructor will specify what sections must be studied for each exam.

Grading Policy

Let g be the grade in percent: $g < 55$ F, $55 \leq g < 66$ D, $66 \leq g < 76$ C, $76 \leq g < 88$ B, $88 \leq g < 100$ A, $g \geq 100$ A+

The grading policy may be subject to slight adjustments depending on the achievements of the students.

Make-ups

There are usually no make-ups for the examinations, except for reasons of illness, stated in writing by a medical doctor, or observance of a religious holiday, or other very reasonable motivations.

Attendance and Class Policies

Attendance is mandatory. Students with up to 4 missed classes for the entire semester will receive an additional bonus of **3%** on the final grade. If students miss a class, it is their responsibility to find out what they missed (announcements, assignments, notes ...). Also, it is their responsibility to frequently check their e-mail for announcements made by the instructor. Students are strongly encouraged to read each section of the textbook in advance of the lecture.

Classes start and end always on time. Students are not allowed to leave the class before the end of the hour without authorization. During class time it is not allowed to text, chat and sleep. All electronic devices must be put in silent mode.

TTU Operating Policies

Americans with Disabilities Act (TTU 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 any 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 student until 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 for observance of a religious holy day (TTU OP 34.19)

1. "Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code 11.20. 2. A student who intends to observe a religious holy day should make that intention known 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. 3. A student who is excused under Section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Academic Honesty (TTU 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.

The grade of "I" (TTU OP 34.12)

The grade of "I" is given only when a student's work is satisfactory but, due to reasons beyond his or her control, cannot not be completed. It is not given in lieu of an "F" or "W". The instructor assigning the grade will stipulate in writing at the time the grade is given the conditions under which the "I" may be removed. The assigned work and a change of grade must be recorded within one calendar year from the date of the "I". Failure to do so results in an "F" for that course.