

Syllabus for Math 5341 (Real Analysis I)

Section 001

Fall 2020

Instructor: Dr. Alex Bearden
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Office: RBN 4009
Preferred Method of Contact: Canvas message or email

Office Hours: MoWe 1:30–3:00 p.m., or by appointment

Delivery Mode: Face-to-face through 11/20 (except two weeks in October)
with online option

Lecture Times: MoWeFr 9:05–10:00 a.m.

Lecture Room: RBN 2011

Catalog Description of Course

Topics include set theory, the real number system, Lebesgue measure, the Lebesgue integral, differentiation and integration, classical Banach spaces. Prerequisite: MATH 4341 or equivalent.

Course Learning Objectives

Upon completion of this course, students should be able to do the following:

- Articulate relevant mathematical ideas relevant correctly and precisely, both verbally and in writing.
- Understand the statements, proofs, and significance of the main theorems in real analysis and be able to apply these in proofs and computations.
- Formulate correct, rigorous mathematical proofs of results in the realm of real analysis.
- Produce and discuss specific examples of phenomena in real analysis.
- Independently read, absorb, and solve problems dealing with new mathematical concepts.

Textbook

The textbook used will be Sheldon Axler's *Measure, Integration, and Real Analysis*. A free digital version of the book can be found at this website: <http://measure.axler.net/>. (There are also links on the linked website above to a few places that sell print versions, which appear to run about \$60.)

Canvas

A Canvas site will be set up for the course. Announcements, grades, notes, and recorded lectures will be posted there.

Reading

To learn and do well in this course, you *must* read the book carefully.

Reading math (and especially the extremely detailed and subtle math we will see in this course) is grueling work, but the payoff is worth it! At first, it will take you a very, very long time to read through even a few lines of a proof, but you must persevere! There is no way to learn this material without reading it on your own, patiently, carefully, line-by-line, checking every. tiny. detail. If you stay faithful to this, magical things will happen.

Homework

Homework will be assigned weekly and due each Wednesday. A selection of problems will be graded and returned with comments. Feel free to work together on the assignments and/or ask me for help, but using solutions found on the internet is not allowed and would be self-defeating to your learning (see also below). Late homework will be accepted very sparingly, and at my discretion.

Exams

There will be three midterm tests during the semester and a cumulative final exam after classes end. All midterm tests will be held in class (if possible). The final exam will be a take-home exam that students will have 48 hours to complete. The dates of the midterm tests are:

- Test 1: Wednesday, September 23
- Test 2: Wednesday, October 21
- Test 3: Wednesday, November 18

Tentatively, the take-home final exam is scheduled to be open Tuesday 12/8 through Wednesday 12/9.

There will be no make-up tests except in pre-approved or verifiable emergency situations.

Cheating

Please do not cheat! It will be considered cheating if a student uses a solution found online for a homework or take-home test, if you work together on any test, divulge material on a test to someone who hasn't taken it yet, discuss a take-home test with anyone during the window it is open, or generally use a resource for a test or homework outside of what is explicitly allowed. I take cheating very seriously, and will harshly sanction anyone found cheating.

Grading

A student's final course grade will be a weighted average of homework grades, three midterm exam grades, and a final exam grade. The weights are as follows:

Homework	20%
Midterm Test 1	20%
Midterm Test 2	20%
Midterm Test 3	20%
Final Exam	20%

Your final letter grade will be determined by a scheme no harsher than the following:

greater than or equal to 90%	A
greater than or equal to 80% and less than 90%	B
greater than or equal to 70% and less than 80%	C
greater than or equal to 60% and less than 70%	D
less than 60%	F

Withdrawal

Friday, September 4: census date; i.e., last day to withdraw without penalty

Monday, November 2: last day to withdraw with a "W"

Course Content

We will plan on reviewing some of the important undergraduate analysis pre-requisites, and then covering Chapters 1–5 of the textbook.

Schedule

The following is a tentative schedule for the course. We will almost certainly deviate from the weekly content described below at some point.

Monday		Wednesday		Friday	
8/24	First day of class Undergrad analysis review	8/26		8/28	
8/31	Review, Chapter 1	9/2	Homework 1 due	9/4	Last day to withdraw without penalty
9/7	NO CLASS (Labor Day) Section 2A	9/9	Homework 2 due	9/11	
9/14	Section 2B	9/16	Homework 3 due	9/18	
9/21	Section 2C	9/23	Midterm 1	9/25	
9/28	Section 2D	9/30	Homework 4 due	10/2	
10/5	Section 2E	10/7	Homework 5 due	10/9	
10/12	Section 3A	10/14	Homework 6 due	10/16	
10/19	Section 3B	10/21	Midterm 2	10/23	
10/26	Section 4A	10/28	Homework 7 due	10/30	
11/2	Last day to withdraw with "W" Section 4B	11/4	Homework 8 due	11/6	
11/9	Section 5A	11/11	Homework 9 due	11/13	
11/16	Section 5B	11/18	Midterm 3	11/20	
11/23	NO CLASS (Thanksgiving)	11/25	NO CLASS	11/27	NO CLASS
11/30	Class Online Section 5C	12/2	Class Online Homework 10 due	12/4	Class Online
12/7	NO CLASS (Study Day)	12/9	Final Exam?	12/11	

(The following are official UT Tyler statements.)

Important Covid-19 Information for Classrooms and Laboratories

Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times in public settings (including classrooms and laboratories), as specified by Procedures for Fall 2020 Return to Normal Operations. The UT Tyler community of Patriots views adoption of these practices consistent with its Honor Code and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home and may join the class remotely. Students who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class remotely. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call 903-566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

(All of the following is standard, UT Tyler-wide, official stuff required to be on the syllabus.)

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please go to this website: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract. The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)

- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, #3150 or call 903.566.7079

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed

Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically

Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructor has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
- iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
- iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students

- The Mathematics Learning Center, RBN 4021. This is an open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- UT Tyler Counseling Center (903.566.7254)