

# MTH 5311: Real Analysis

Sul Ross State University  
Fall 2023

**Professor:** April Maria Ortiz, Ph.D.\*

**Pronouns & Honorifics:** she / her / ma'am / Professor / Dr. Ortiz

**E-mail:** mortiz4@sulross.edu

**Office:** Uvalde Campus A101

**Office Phone:** (830) 279-3048

**Cell Phone:** (830) 333-0164

**Course Description** MTH 5311 is intended as an introduction to Metric spaces, Lebesgue measure, integration, differentiation, function spaces and harmonic analysis.

**Class Time** Thursday, 6:30 – 8:30 p.m., or as announced (web-based class)

**Required Text** Kenneth Ross, *Elementary Analysis*, ISBN 9781461462705

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## Course Policies

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### Attendance Policy

Attendance is mandatory. Students are expected to attend class in person in their classroom of registration unless permission is given for extenuating circumstances. You will be held responsible for all material covered in class or in the reading assignments. If you have to miss a class, it is your responsibility to obtain all notes, assignments, and announcements from someone else in the class. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

### Communication

The Blackboard system will be used to provide course materials, submit assignments, and post grades. You are welcome to e-mail, call, or text me at any time. My cell number is **(830) 333-0164**. Please identify yourself in your text or voicemail. Please make sure to check the e-mail address associated with Blackboard on a regular basis.

### Grading Policy

Your grades will be weighted as follows:

Homework	60%
Final Exam	40%

A student who averages at least 90% will receive an A; at least 80% will receive at least a B; at least 70% will receive at least a C; at least 60% will receive at least a D.

### Homework

For each section you will be asked to complete an assignment. Assignments will be made available on Blackboard. Homework can be submitted in a variety of formats, but each assignment must be

\* This differs from my current legal name. Let's model a classroom that fosters inclusion of all people.

submitted as a single file that I can view and grade on Blackboard.

One possibility would be to type up your homework using the Equation Editor on Microsoft Word and save it as a PDF. Another would be to capture high-quality images of your homework using a phone or other device and combine into a single file, e.g. by pasting each image into a word processor file. Feedback will be provided in the form of comments your Blackboard file.

All work must be shown for full credit. Try to be as tidy as possible so that I can understand your work. I'm flexible as to file format provided I can view your submission on Blackboard. Submissions consisting of multiple image files will not be graded as it's too easy for me to lose my place and miss something. If I have trouble seeing your file, I will let you know and give you a chance to resubmit.

Each problem will be worth 4 points unless otherwise noted.

**ALWAYS TURN IN THE HOMEWORK, EVEN IF IT'S INCOMPLETE.**

**YOU WILL NOT PASS THE CLASS IF YOU DON'T SUBMIT HOMEWORK.**

I'm flexible about due dates if something comes up, but unexcused late work may receive a zero.

Feedback will be provided in the form of notes on your submitted file. It is your responsibility to carefully view all feedback and contact me if you have any questions or concerns.

### **Exams**

There will be a comprehensive online final exam during the university final exam period, which is December 8 and December 11 – 13.

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## **Subject Outline**

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- I. Sequences: *limits – monotone sequences – Cauchy sequences – subsequences – series – series tests – decimal expansions*
- II. Continuity: *continuous functions – uniform continuity – limits of functions – metric spaces*
- III. Differentiation: *basic properties – the mean value theorem – L'Hospital's rule*
- IV. Integration: *the Riemann integral – the fundamental theorem of calculus – Riemann-Stieltjes integrals – Lebesgue integration – improper integrals*
- V. Sequences and Series of Functions: *power series – uniform convergence – differentiation and integration fo power series – Taylor's theorem*

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## **Schedule**

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*This schedule is tentative only. The unit numbers refer to the above outline.*

August 31 – September 14	Unit I
September 14 – October 5	Unit II
October 5 – 26	Unit III
October 26 – November 16	Unit IV

November 22 – 24  
November 16 – 30  
**December 8, 11 – 13**

*Thanksgiving Break*  
Unit V  
**Final Exam**

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## University Statements

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**Distance Education Statement.** *Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website.*

*Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires a secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.*

**SRSU Accessibility Services.** *Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Mrs. Mary Schwartz Grisham, LPC, SRSU's Accessibility Services Director at 432-837-8203 or email [mschwartz@sulross.edu](mailto:mschwartz@sulross.edu). Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine, Texas, 79832.*

**Counseling Services.** *Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counseling sessions. You can learn more about this 24/7/356 support by visiting [Timelycare/SRSU](https://www.timelycare.com/srsu). The SR Counseling and Accessibility Services office will continue to offer in-person counseling in Ferguson Hall room 112 (Alpine campus), and telehealth Zoom sessions for remote students and RGC students.*

**Libraries.** *The Bryan Wildenthal Memorial Library in Alpine offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, [library.sulross.edu](https://library.sulross.edu). Off-campus access requires logging in with your Lobold and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email ([srsulibrary@sulross.edu](mailto:srsulibrary@sulross.edu)), or by phone (432-837-8123).*

*No matter where you are based, public libraries and many academic and special libraries welcome the general public into their spaces for study. SRSU TexShare Cardholders can access additional services and resources at various libraries across Texas. Learn more about the TexShare program by visiting [library.sulross.edu/find-and-borrow/texshare](https://library.sulross.edu/find-and-borrow/texshare) or ask a librarian by emailing [srsulibrary@sulross.edu](mailto:srsulibrary@sulross.edu).*

*Mike Fernandez, SRSU Librarian, is based in Eagle Pass (Building D-129) to offer specialized library services to students, faculty, and staff. Utilize free services such as InterLibrary Loan (ILL) and ScanIt to get materials delivered to you at home or via email.*