MATH/MTH 3340 Syllabus
Foundations of Higher Mathematics
Spring 2026 Sul Ross State University

Secs.: **001**, **VMC**, **V01** (**MTH**):	Mon, Wed: 2-3:15p in ACR 206
Instructor:	Dr. Kris Jorgenson
Office:	ACR 109D
E-mail:	kjorgenson@sulross.edu
Office Hours:	Mon, Tue, Wed, Thu: 10-11a, 3:30-4:30p;
	Fri: 10a-12p; also by appointment

Course Description: Mathematicians do not know for sure in advance if their assertions are true. They need to verify assertions with rigorous proofs or produce counterexamples, then attempt to salvage the assertions by transforming them into theorems. This course combines a discovery-based approach with a traditional lecture format in which students will write original mathematical proofs. Students will study organization and structure of mathematical thought through writing and evaluating proofs. Students will evaluate the truth of and prove mathematical statements in topics that include propositional logic, set theory, functions, sequences, relations, number theory, graph theory, and other mathematical areas. The prerequisite is MATH 2311/MTH 3309, or MATH 2414, or consent of instructor.

Student Learning Objectives: Successful students will write original mathematical proofs using various types of logical arguments such as direct proof, indirect proof, proof by contradiction, and induction. Students will gain practice presenting their proofs in class.

This course is supportive of the
Student Learning Outcomes for the Bachelor of Science degree in Mathematics:

1) The student will be able to demonstrate content knowledge of basic mathematical principles.

2) The student will be proficient in logic, able to negate statements, provide counterexamples to false statements, and determine the validity of arguments.

3) The student will be able to communicate mathematical content clearly and with valid reasoning.

Required Materials:

Textbook: There is no required textbook. I will hand out printed notes.

Scientific Calculator: There will be some need of a scientific calculator though calculators may be used to check arithmetical calculations throughout the semester. A scientific calculator contains buttons with the denotations such as y^x, a^b, e^x, SIN, COS, TAN, but use of a calculator will not be a large part of this course. Appropriate scientific calculators cost usually \$8-\$50 each. Symbolic graphing calculators, such as the TI-89 or TI-92, will not be allowed. Non-symbolic, menu-driven graphing calcultors, such as the TI-84, may be used, but are not required. Please check with me about this at the beginning of the semester.

Class Materials: Students are expected to be prepared in every class with pencils and

paper to take notes and get involved in in-class discussion and assignments. You should also have access to Blackboard and have an e-mail address that you check regularly be your e-address registered in Bb since I may need to contact you outside of class with important information.

Grades: **20**% (**homework**, **class presentations**) Classes will be a combination of lecture and examples by the instructor and time spent with students presenting results in class in order to discuss proving methods. Students may use only class notes (perhaps their notes derived from the lecture), themselves, and the instructor for help in writing proofs for their homework grade. This will foster a student's ability in writing mathematical proofs.
There will be **3 in-class tests** (**for a total of 70**%) based on the homework assignments.

The test dates are as follows:

Test 1	**Wed**, **Feb 18**
Test 2	**Wed**, **April 1**
Test 3	**Tue**, **May 5**, **3-5p**

Students joining in remotely will need to take their tests in a testing center, or have their tests proctored by a third party. There will be a **10**% **Attendance** grade. If a student is joining in remotely in such a way that I cannot see or hear the student during class, we may need to forgo the attendance grade in this case and the Test Average will count as 80% rather than 70%.

Late Work, **Rescheduled Quizzes**/**Tests** Deadlines will be stated for each homework grade. Usually homework can be re-done or corrected for full credit as long you do so before the next test. Test corrections can be made after taking the test initially for half credit To take a test or hand in an assignment at a time other than the scheduled time, you must notify me of this absence on or before the day missed, and satisfy one of two requirements: either (1) supply a written medical excuse signed by a medical professional for the day of the absence, or (2) if your excuse is for a university activity, you must notify me about this authorized absence in writing with your name, the name of your organization and the date(s) of your absence (sending me an e-mail is a good way to do this), and your name must appear on a published explained absence list that I am provided or verified by a faculty sponsor. Also, you and I must set up a time for you to make up the test or assignment within a reasonable time period (not more than 1 or 2 days) before or after the time of the missed grade. Usually I will let you make up a grade according to the above conditions if it is due to another one-time occurrence, such as the care of someone else in your family or a friend, or a work-related excuse as long as you can document your absence and you let me know BY THE DAY OF THE ABSENCE AT THE LATEST.

Attendance I will be taking attendance as university policy precludes you from missing 3 weeks or more of classes for anything other than authorized university activities. To excuse an absence for a university activity, in addition to letting me know of the absence by the day of the absence (as explained previously) you must also spend at least 60 minutes outside of class on this course with me in my office area. Also I will allow you to excuse a test day for a documented medical absence as long as you also make up the test with me or in the testing center. If you have 6 or more unexcused absences (3 weeks of classes), I reserve

the right to drop you from this class with a grade of 'F', which is university policy.

Good Advice Concentrate on learning the material of the course rather than worrying about your grade. Your time is best spent concentrating on the material to be learned in the impending assignments, asking questions, and devoting yourself to activities that will help you learn the material and do better in the course. I will worry about the details of your grade since you doing so does not help you earn a higher grade. But learning the material and doing well on the tests *will* help your grade. **Remember that math is not a spectator sport**, so the more problems you work yourself, and the more practice you get, the more confident you will be, and you will do better in this course. Working on the problems helps you to figure out what your specific questions are. Remember an individual homework or quiz grade may not count for a lot in your overall grade, but working and learning from the homework and quizzes is **essential** because this is where you learn the topics that will appear on the tests, which do count for a lot of your grade. The best lessons learned often come from correcting a quiz or homework problem in which you have made a mistake.

More Good Advice

Keep absences to a minimum. You never know when you might miss something you will find important either from the lecture or class discussion such as questions other students ask. Remember: YOU ARE RESPONSIBLE FOR EVERYTHING THAT IS DISCUSSED DURING CLASS WHETHER YOU ARE PRESENT OR NOT.

It's human nature to be controlled by our habits, so once you develop a weekly habit for the semester, it can be hard to break this habit. So be sure that you allow the necessary time for this course FROM THE BEGINNING, ESPECIALLY if you consider mathematics not to be your best subject. You should attend EVERY class of a college mathematics course. Not showing up to class or not doing the required work will not cause this class to magically go away. If you are not understanding the material and/or have fallen behind in your work, missing class will not help. IF YOU FALL BEHIND, PLEASE DO NOT DROP THIS COURSE WITHOUT TALKING TO ME FIRST. Making mistakes or falling behind is natural, so it is best to talk to me about this. If you do have to miss class, let me know before this absence, and plan to come and see me and make an appointment to discuss what was missed and pick up assignments or discuss what you are not understanding. It is essential to get your questions answered, which you are welcome to do in my office. However meeting in my office is not a substitute for attending class.

Ask questions no matter how easy or trivial they may seem. There is no such thing as a bad or silly question. Questions result when you are interested and have been thinking about areas, such as mathematics, in which you have some limitations in your educational background. Being in a college mathematics course means you will have questions both obvious and more subtle. ASKING QUESTIONS IS A VERY IMPORTANT PART OF LEARNING.

Study and work problems regularly–every day or every other day. Work on assignments discussed in class as soon as you can after class while the methods discussed are still fresh in mind. You can't expect to succeed in a math course by waiting till the last minute to only study and cram prior to a test. If you promise yourself you will study for ½-hour, get into the work, forget the clock, then the next thing you know, you've studied and worked for one to two hours. Remember that

LEARNING FROM MISTAKES + PERSISTENCE = SUCCESS!

Classroom Conduct It is important to conduct yourself in a college classroom so that everyone can benefit from good communication between instructor and students. My goal is to create an environment in which everyone can do their best work, learn, and make the best grades possible.

I think you will find that I am a very friendly, sympathetic, and generous instructor as long as you are sincerely working to succeed in this course and certain guidelines for classroom behavior are followed to allow a sanctity of study for you and your fellow students. Habits such as holding conversations during lecture, or being engaged in activities not related to this course such as working on a different course or reading your cellphone will work against the goal of this course and cause you to be counted absent. Also engaging with electronic communication devices of any kind during class or coming into class more than 5 minutes late or leaving early before class is dismissed circumvent the goals of this course and cause you to lose credit. My sympathy and generosity will quickly evaporate if I find that you are working against the goals of the course or that you are simply trying to get a good grade without learning or without honestly doing the required work. I want you to have every opportunity to succeed in this course.

Please be aware of the rules for Academic Honesty that you will find in the Sul Ross Student Handbook. Use commonsense to think of anything else that will allow you to learn and do the best work that you can in this class, and for me to better help you do your best work. Remember that being registered for this course does not allow you to behave in any manner you wish during class. You must keep other people in mind. It is within university policy for me to send a student out of this class on a temporary or permanent basis if disruptions or interruptions like the types listed above persist.

Program Marketable Skills:

Marketable Skill (MS) 1: Students Demonstrate Logical and Analytical Skills.

MS 2: Students Demonstrate Problem-Solving Using Analytic and Algebraic Methods.

MS 3: Students Use Technology in Problem-Solving and Presentation.

MS 4: Students Use Communication and Pedagogical Skills.

Academic Integrity

Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. Students should submit work that is their own and avoid the temptation to engage in behaviors that violate academic integrity, such as turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden. Students should also avoid using open AI sources unless permission is expressly given for an assignment or course. Violations of academic integrity can result in failing assignments, failing a class, and/or more serious university consequences. These behaviors also erode the value of college degrees and higher education overall.

ADA Statement

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 Ronnie Harris, LPC, SRSU's Accessibility Services Director at 432-837-8203 or email ronnie.harris@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.

Student Responsibilities Statement

All full-time and part-time students are responsible for familiarizing themselves with the Student Handbook and the Undergraduate & Graduate Catalog and for abiding by the University rules and regulations. Additionally, students are responsible for checking their Sul Ross email as an official form of communication from the university. Every student is expected to obey all federal, state and local laws and is expected to familiarize him/herself with the requirements of such laws.

SRSU 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.

Counseling

Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counseling sessions. You can learn more about this 24/7/365 support by visiting Timelycare/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.

Classroom Climate of Respect

Importantly, this class will foster free expression, critical investigation, and the open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender, national origin, or sexual preference. Still we will not be silenced by the difficulty of fruitfully discussing politically sensitive issues.

Supportive Statement

I aim to create a learning environment for my students that supports various perspectives and experiences. I understand that the recent pandemic, economic disparity, and health concerns, or even unexpected life events may impact the conditions necessary for you to succeed. My commitment is to be there for you and help you meet the learning objectives of this course. I do this to demonstrate my commitment to you and to the mission of Sul Ross

State University to create a supportive environment and care for the whole student as part of the Sul Ross Familia. If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you.

Important Dates
(**16-week term**)

Wed, Jan. 14	First day of classes 16-week term, first day of late registration
	and schedule changes
Mon, Jan. 19	MLK, Jr. Holiday, No Classes
Tue, Jan. 20	Last day for late registration and schedule changes
Fri, Jan. 30	Last Day to Drop a 16-Week Course Without
	Creating an Academic Record; 12th class day 16-week census
Mon-Fri March 9-13	Spring Break Holidays, No Classes
Mon, March 16	Mid-Semester, 16-week term
Fri, April 3	Last day to drop a class with a grade of "W" in a 16-week course
	by 4 pm in University Registrar's Office
Fri, April 3	University/Community Meal on the Mall, SRSU birthday
Mon, April 13	Honors Convocation, 7 pm, Marshall Auditorium
Wed, April 29	Last Day of Class before Finals, 16-week term
Thu, April 30	Dead Day 16-week term, No Classes
Fri, Mon-Wed: May 1, 4-6	Final Exams 16-week term, End of Term

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X = No Classes	Mon	Wed
Jan. 14	**X**	First Day of Class Even, Odd Integers
Jan. 21	**X - MLK Holiday, No Classes**	Sets, Equality of Sets
Jan. 26, 28	Logic	Logic
Feb. 2, 4	Negation	Induction
Feb. 9, 11	Fibonacci Sequence	Induction
Feb. 16, 18	Review for Test 1	**Test 1**
Feb. 23, 25	Sets, Functions	Bijections
Mar. 2, 4	Trig Identities	Trig Identities
	Spring Break March 9-13 ---------->	
Mar. 16, 18	Trig Identities	Trig Identities
Mar. 23, 25	Cardinality	Sets of Real Numbers
Mar. 30, Apr. 1	Review for Test 2	**Test 2**
Apr. 6, 8	Irrational Numbers	Irrational Numbers
Apr. 13, 15	Countable Sets	Uncountable Sets
Apr. 20, 22	Cantor's Theorem	Fibonacci Sequence
Apr. 27, 29	Induction	Review for Test 3
May. 5	**Test 3 Tue May 5, 3-5p in ACR 206**	