Math 3340 Syllabus
Foundations of Higher Mathematics
Spring 2021 Sul Ross State University

Sec. **001**:	Tue, Thu: 6-7:15p in ACR 206
Instructor:	Dr. Kris Jorgenson
Office:	ACR 109D
E-mail:	kjorgenson@sulross.edu
Office Hours:	Mon: 11a-12p, 2:30-3:30p; Tue, Thu: 10-11a, 2:30-4p;
	Wed: 11a-12p; Fri: 11a-12p, 3:30-4:30p; 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. The prerequisite is 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: **Daily Grade 30**% (**homework**, **attendance**, **class participation**) 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.
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	**Thu**, **Feb 18**
Test 2	**Thu**, **April 1**
Test 3	**Mon**, **May 3**, **6-8p**

Late Work, **Rescheduled Quizzes/Tests** Deadlines will be stated for each homework grade. Sometimes there is some flexibility, but often homework handed in late is 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 more than 5 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 75 minutes outside of class on this course with me. 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, the more practice you get, the more confident you will be, and the better you will do in this course. Working on the problems helps you to figure out what your specific questions are.

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 "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.

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 a classroom 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. Class 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 and building codes prohibiting food, beverages, tobacco (smokeless or otherwise) in the classroom. 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.

Equal Access: **ADA Statement**: Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. Students with qualifying disabilities who seek accommodations must initiate a request for a meeting for accessibility services. Students seeking accessibility services must contact Rebecca Greathouse Wren, M.Ed., LPC-S, Counseling & Accessibility Services, Telephone: 432-837-8203, or E-mail: rebecca.wren@sulross.edu.

For more information see: https://www.sulross.edu/page/1384/accessibility-services

Important University Dates

Mon, January 11	First day of classes, first day of late reg. and schedule changes
Thu, January 14	Last day for late registration and schedule changes
Mon, January 18	Martin Luther King, Jr. Holiday, No classes
Wed, January 27	Last Day to Drop Without Creating an Academic Record
Mon-Fri, March 8-12	Spring Break Holidays, No classes
Thu, April 1	Last day to withdraw from a course with a grade of “W” by 4 pm
	in Registrar’s Office
Thu, April 1	University/Community Meal on the Mall;
	SRSU birthday Sat. April 3
Fri, April 2	Good Friday Holiday, No classes
Mon, April 19	Honors Convocation, 7 pm Marshall Auditorium
Wed, April 28	Last Day of Classes before finals
Thu, April 29	Dead Day, No classes
Fri-Wed, Apr. 30, May 3-5	Final Exams, End of Term

Math 3340 Foundations of Higher Mathematics--Tentative Course Outline--Spring 2021		
	Tue	Thu
Jan. 12, 14	Even, Odd Integers	Even, Odd Integers
Jan. 19, 21	Sets, Equality of Sets	Logic
Jan. 26, 28	Logic	Induction
Feb. 2, 4	Fibonacci Sequence	Induction
Feb. 9, 11	Sets, Functions	Bijections
Feb. 16, 18	Review for Test 1	**Test 1**
Feb. 23, 25	Irrational Numbers	Irrational Numbers
Mar. 2, 4	Trig Identities	Trig Identities
	Spring Break March 8-12 ---------->	
Mar. 16, 18	Infinite Sets	Infinite Sets
Mar. 23, 25	Cardinality	Sets of Real Numbers
Mar. 30, Apr. 1	Review for Test 2	**Test 2**
Apr. 6, 8	Countable Sets	Countable Sets
Apr. 13, 15	Uncountable Sets	Cantor's Theorem
Apr. 20, 22	Fibonacci Sequence	Induction
Apr. 27	Review for Test 3	**X - Dead Day, No Classes**
	Test 3 Mon. May 3, 6-8p in ACR 206	