

**Sul Ross State University**  
**Course Syllabus**  
**MATH 4301-H01, H02, H03: Modern Algebra**  
**Spring 2023**

**Instructor:** Dr. Angela Brown

**Office Number:** ACR 107B

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**Office Hours:** 10 am-12 pm and 2-4 pm M, 10 am-12 pm and 4-5 pm W, 10-11 TR, others by appointment

**Time and Place of Class Meetings:** TR 2:00-3:15 pm ACR 206

**Prerequisites:** MATH 3301 and MATH 2318

**Required Textbooks:** *Contemporary Abstract Algebra, 9th Edition* Gallian, J., 2017. ISBN 9781305657960

**Other Equipment Needed:** paper and pencils.

**Course Content:** We will cover group theory in depth and introduce the topics of rings and fields. This will be adjusted as necessary.

**Learning Objectives** The student will be able to prove mathematical statements with varying methods of proof, including direct proofs, proof by induction, proof by contradiction and proof by contrapositive. The student will be able to use the varying methods of proofs to prove their own theorems pertaining to abstract algebra. The student will be able to recognize and dispute invalid mathematical statements using counter-examples. Students will gain understanding of groups and rings in part by the study of such underlying concepts as equivalence relations, congruence classes, and quotient structures.

**Mathematics Program Learning Objectives:** The graduating student should be able to

- Apply knowledge of basic mathematics principles.
- Identify and provide valid proofs or solutions for theorems or problems.
- Recognize and dispute invalid mathematical statements by using counter-examples.

**Marketable Skills: Mathematics BS**

- Students Demonstrate Logical and Analytical Skills.
- Students Demonstrate Problem-Solving Using Analytic and Algebraic Methods.
- Students Use Technology in Problem-Solving and Presentation.
- Students Use Communication and Pedagogical Skills.

**Grading Scale:** 90-100 A, 80-89 B, 70-79 C, 60-69 D, 59-Below F

**Grading Policy:** The grade weighting will be as follows:

Homework: 30%

Exams : 40%

Final Exam: 30%

Homework will be assigned periodically throughout the semester. Homework assignments must be complete and will be turned in during class. Due dates will be placed on Blackboard. Not all problems will be graded for content, but the assignment grade is contingent on completeness. If you use outside references, make sure to properly source the material.

There will be three exams in addition to the final exam. All exams will be closed notes, closed book, and no calculators allowed. No make-up exams will be given unless due to a school function. If you miss an exam with a valid excuse, the grade you make on the final exam can replace this grade.

The final exam is on Monday May 15 at 12:30 pm.

**General Policies:** Class will start at the designated time and run for 1hour and 15 minutes with no breaks. You are expected to be on time, attend every class meeting, stay for the duration of class time and come to learn. Do not schedule any appointments that will conflict with class time; if you have done so then I need documentation of the appointments.

You are expected to bring all necessary materials and take notes and participate. You are expected to turn-off and not to access any electronic, non-task oriented device such as cell/smart phones, tablets, and i-pods. A cell-phone cannot be used as a calculator. Devices for recording the lecture are permitted; either audio or video. Please inform the instructor in you plan to do so.

If you come to class without your materials then you will be released from class to go get the appropriate materials. Working on another class during this class is not allowed. If you are causing others around you to miss lecture material then you will be asked to leave.

Any personal business must be conducted during office hours or by appointment. I will only discuss grades and attendance issues in my office. Classroom time is for the entire class.

**Attendance Policy:** Students are expected to attend every class. If class must be missed, the student is expected to get the notes from a classmate, and to check with me or on Blackboard for announcements and updated assignments. You are expected to check your Sul Ross e-mail account. Absences due to school functions should be discussed with me ahead of time.

Students are expected to arrive to class on time. If a student is perpetually late, they will be asked to not attend class unless they arrive on time. If tardiness becomes a problem for the class as a whole, people who arrive late will not be permitted to enter the class. If this stricter policy becomes necessary, there will be an announcement made in class.

It is policy of the university to drop a student with a grade of "F" if 9 hours or more of class are missed. For this course that would be 6 or more class sessions missed.

**Americans With Disabilities Act:** SRSU Disability Services. Sul Ross State University (SRSU) is committed to equal access in compliance with 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. Alpine students seeking accessibility/accommodations services must contact Mary Schwartz Grisham, M.Ed., LPC, SRSU's Accessibility Services Coordinator at 432-837-8203 (please leave a message and we'll get back to you as soon as we can during working hours), or email mschwartz@sulross.edu. Our office is located on the first floor of Ferguson Hall (Suite 112), and our mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832.

**Library Services:** 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. Off-campus access requires logging in with your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or phone (432-837-8123).

**Academic Integrity:** Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. A scholar is expected to be punctual, prepared, and focused; meaningful and pertinent participation is appreciated. Examples of academic dishonesty include but are not limited to: 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.

**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.

**Diversity Statement:** I aim to create a learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors your identities (including race, gender, class, sexuality, religion, ability, socioeconomic class, age, nationality, etc.). I also understand that the crisis of COVID, economic disparity, and health concerns, or even unexpected life events could 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 an inclusive 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:**

January 18	First Day of Classes
January 24	Last Day for Late Registration and Schedule Changes
February 2	12th Class Day
March 13-17	Spring Break
April 14	Last Day to Withdrawal from University or Drop Classes with a Grade of “W” (by 4 pm)
May 10	Last Day of Classes
May 11	Dead Day
May 12, 15-17	Final Exams
May 19	Commencement

## Tentative Schedule-Subject to Change

	Tuesday		Thursday
		Jan 19	Ch0 and Intro to Groups
Jan 24	Groups	Jan 26	Finite Groups
Jan 31	Subgroups	Feb 2	Cyclic Groups
Feb 7	Permutation Groups	Feb 9	Exam 1
Feb 14	Isomorphisms	Feb 16	Isomorphisms
Feb 21	Cosets	Feb 23	LaGrange’s Theorem
Feb 28	External Direct Products	Mar 2	Normal Subgroups
Mar 7	Groups Homomorphisms	Mar 9	Fundamental Theorem of Finite Abelian Groups
Mar 21	Fund Theorem Cont.	Mar 23	Intro to Rings
Apr 4	Exam 2	Apr 6	More Rings
Apr 11	Integral Domains	Apr 13	Ring Homomorphisms
Apr 18	Fields	Apr 20	Fields
Apr 25	Extension Fields	Apr 27	Exam 3
May 2	Finite Fields	May 4	Finite Fields
May 9	Review		