Math 4391: Algebraic Topology

Course Syllabus

This syllabus is current and accurate as of its posting date, but it will not be updated. For the most complete and up-to-date course information, contact the instructor.

Contact Information

**Instructor:** Dr. Simon Pfeil  
**Office:** MCS 219C  
**Office Hours:**  
- Monday: 9am-10am, 12pm-1pm;  
- Tuesday: 9am-9:30am, 11am-12:30pm;  
- Wednesday: 9am-10am, 11am-1pm;  
- Thursday: 9am-9:30am, 11am-12:30pm;  
- Friday: 9am-10am;  
and by appointment.

**E-mail:** simon.pfeil@angelo.edu  
**Phone:** 325-486-5436

Course Information

**Course Description:** Operations on spaces, Homology, Fundamental Group, Cohomology.

**Textbook:** *Algebraic Topology*, by Hatcher.

**Course Content:** The following chapters including the particular sections listed are covered.

0. **Some Underlying Geometric Notions:** Homotopy and Homotopy Type, Cell Complexes, Operations on Spaces, Two Criteria for Homotopy Equivalence, The Homotopy Extension Property.

1. **The Fundamental Group:** Basic Constructions, Van Kampen’s Theorem, Covering Spaces.


3. **Cohomology:** Cohomology Groups, Cup Product, Poincare Duality, Additional Topics.

4. **Homotopy Theory:** Homotopy Groups, Elementary Methods of Calculation, Connections with Cohomology, Additional Topics.

Course Evaluation

Your grade for this course will be determined by your performance on tests, homework, quizzes, and a final exam. Final grades will be based on a standard 10-point grading scale.
Homework (100%): Homework assignments will be issued throughout the semester, and will be graded for accuracy. Corrections will be allowed.

Other Information

Student Absence for Observance of Religious Holy Days:
A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

Incomplete Grade Policy:
It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

Student Disability Services:
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation. The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting:

Ms. Dallas A. Swafford
Director of Student Disability Services
325-942-2047
Dallas.Swafford@angelo.edu
Houston Harte University Center

Title IX:
Angelo State University is committed to the safety and security of all students. If you or someone you know experience sexual harassment, sexual assault, domestic or dating violence, stalking, or discrimination, you may contact ASU’s Title IX Coordinator:

Michelle Nicole Boone, J.D.
Director of Title IX Compliance
325-486-6357
Michelle.Boone@angelo.edu
Mayer Administration Building

Academic Integrity
Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject to disciplinary action and possible expulsion from ASU.
The College of Science and Engineering adheres to the Statement of Academic Integrity

Copyright Policy
Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

Plagiarism
Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft.
In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list. Papers are subject to be evaluated for originality via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center.

General Policies Related to This Course
All students are required to follow the policies and procedures presented in these documents:

Angelo State University Student Handbook

Angelo State University Catalog

Student Learning Outcomes

Students will demonstrate factual knowledge including the mathematical notation and terminology used in this course. Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in college algebra including the real numbers, exponents, radicals, polynomials, factoring, functions, equations, inequalities,.

Students will describe the fundamental principles including the laws and theorems arising from the concepts covered in this course. Students will identify and apply the laws and formulas that result directly from the definitions; for example, the quadratic formula, rules of exponents, and properties of logarithms.

Students will apply course material along with techniques and procedures covered in this course to solve problems. Students will use the facts, formulas, and techniques learned in this course to simplify algebraic expressions, graph functions, and solve inequalities, equations and systems of equations.
Students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields. Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring college algebra as a prerequisite, or for work in occupational fields requiring a background in algebra. These fields might include education, business, finance, marketing, computer science, physical sciences, and engineering, as well as mathematics.

**How to Get Help**

Angelo State University offers many free ways to get help in your classes, especially in math.

1. **Office Hours:** I have ten hours every week that are set aside to work with students. These hours are on the first page of this syllabus, and no appointment is necessary during these times. I am also available at other times by appointment. Speak with me after class or email me at simon.pfeil@angelo.edu to set up a time.

2. **Email:** Almost every day, I am available via email at simon.pfeil@angelo.edu. Feel free to email me anytime with questions: I'll respond as soon as possible.