MATH 4391.030 Algebraic Topology – Spring 2018

Instructor Info:

Instructor: Dr. Susan Abernathy
Office: MCS 220i
Phone: 325.486.5442
Office Hours: M 9-12, T 2-4
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Email: All of the following addresses work.
They all go to the same inbox; pick your favorite and use that one.
susan.abernathy@angelo.edu
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Meetings:

Thursdays 3-4pm in MCS 220i

Textbooks:

Topology by James Munkres
Algebraic Topology by Alan Hatcher

Course Content

An overview of foundational topics in algebraic topology. This may include but is not limited to homotopy, fundamental group, covering spaces, deformation retractions, covering transformations, Seifert-van Kampen Theorem, and homology.

Assessment and Grading

Written homework will be assigned regularly. Solutions are expected to be on time, neatly written, with correct grammar and spelling. Late homework is not accepted. Final grades will be determined based on written homework and participation. Regular attendance is expected.

Student Responsibilities

The student is solely responsible for:

- Maintaining academic honesty.
- Completing all reading assignments. Homework assignments will rely on information contained in the reading.
- Completing each assignment by the specified due date.
- Being proactive about their grade in this course. This includes utilizing (as needed) all available study aid options (emailing professor, reading outside sources, using the discussion board, etc.) to resolve any questions or concerns you might have about any aspect of the course.

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. The full details can be found in ASU Operating Policy OP 10.19 Observance of Religious Holy Days.
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 Conduct Policies

- **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 of disciplinary action and possible expulsion from ASU. The College of Science and Engineering adheres to the Statement of Academic Integrity.
- **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.

- **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.

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

Disclaimer
This syllabus is current and accurate as of its posting date, but will not be updated. For the most complete and up-to-date course information, email the instructor at one of the addresses listed above.

Course Outline
The following is a tentative outline of due dates for the course. I reserve the right to change the material, sequence, and/or due dates. Students will be notified in advance of any change that is made.

Week 1: Paths and homotopy
Week 2: Paths and homotopy
Week 3: Homotopy equivalence
Week 4: Fundamental group
Week 5: Fundamental group
Week 6: Fundamental group
Week 7: Seifert-van Kampen Theorem
Week 8: Covering spaces
Week 9: Covering spaces
Week 10: Covering transformations
Week 11: Covering transformations & group actions
Week 12: Simplicial homology
Week 13: Simplicial homology
Week 14: Singular homology
Week 15: Singular homology

Mathematics 4391 Algebraic Topology Student Learning Outcomes

1. Students will demonstrate factual knowledge including the mathematical notation and terminology used in this course. Students will demonstrate the ability to read, interpret, and use the vocabulary, symbolism, and basic definitions of algebraic topology, including paths, homotopy, fundamental group, and covering space.

2. Students will describe the fundamental principles including the laws and theorems arising from concepts covered in this course. Students will be able to identify and use theorems from introductory algebraic topology. Students will demonstrate an understanding of Seifert-van Kampen Theorem.

3. Students will apply course material along with procedures and techniques covered in this course to solve problems. Students will apply definitions, theorems, and techniques of algebraic topology to solve problems involving paths, homotopy, fundamental groups, and covering spaces.

4. Students will develop specific skills, competencies, and thought processes sufficient to support further study or work in the field of education. Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study or teaching mathematics.

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i Observance of Religious Holy Days: [http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of](http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of)
ii Grading Procedures: [http://www.angelo.edu/content/files/14197-op-1011-grading-procedures](http://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
iv ASU Writing Center: [http://www.angelo.edu/dept/writing_center/academic_honesty.php](http://www.angelo.edu/dept/writing_center/academic_honesty.php)
vi University Catalog: [http://www.angelo.edu/catalogs/](http://www.angelo.edu/catalogs/)