– Math 436 –
INTRODUCTION TO TOPOLOGY

- **INSTRUCTOR**: *Dr. Paulo Lima-Filho*
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- **PREREQUISITES**: Math 220 and Math 221 or permission of the instructor.
- **TEXTBOOK**: *Topology*, by Sheldon W. Davis, McGraw-Hill Walter Rudin Series in Advanced Mathematics.
- **OBJECTIVES**: This course provides an introduction to Topology, covering in detail basic concepts in point-set topology. It provides a solid background for the graduate topology sequence: Math 636-637.
- **TOPICS**:
  i. Metric spaces: Open and closed sets, interior points, sequences, completeness, Baire category theorem;
  ii. Continuity on metric spaces: equivalent formulations, uniform continuity, contractions and Banach fixed point theorem;
  iii. Topological spaces: open and closed sets, bases and subbases, local bases, countability axioms (1st and 2nd countable spaces, Lindelöf and separable spaces;
  iv. Basic notions: continuous functions, homeomorphisms, glueing lemma, product and subspace topologies;
  v. Separation axioms: T_0, T_1, T_2, T_3 and T_4 spaces; Hausdorff, regular, normal and completely regular spaces; Urysohn's Lemma and metrization theorem, Tietze's extension theorem;
  v. Compactness: Compact spaces, compactness in metric spaces, Heine-Borel property;
  vi. Local compactness: Locally compact spaces, one-point compactification, Baire category theorem;
  vii. Connectedness: connected and path-connected spaces;
  viii. Basic notions in homotopy theory: Homotopy relations, contractibility, fundamental group, applications.
  ix. Additional topics: Time permitting, we will discuss quotient spaces, the notion of paracompactness and topological manifolds.

- **HOMEWORK PROBLEMS**:
  Chapter 2: 4, 7, 9, 10, 12, 13, 14, 16
  Chapter 3: 2, 3, 5, 8, 10
  Chapter 4: 1, 4, 6, 7, 8
  Chapter 5: 2, 6, 8, 10, 12, 13, 15, 18, 20
  Chapter 6: 2, 3, 6, 9, 11, 13
  Chapter 7: 2, 3, 4, 6, 8, 11
  Chapter 8: 2, 4, 6
  Chapter 9: 3, 4, 5, 7
  Chapter 10: 2, 4, 6, 8
  Chapter 12: 1, 2, 3, 4, 5, 6
- **POLICIES**:
  Grading: The course grading will be based on the results of 2 exams, one Final Exam, a take-home project and homeworks. The grade distribution is explained in the tables below.

Activity	Points worth	Range	Final Grade
Exam I	100 pts	$\geq 480pts$	A
Exam I	100 pts	$420 \leq pts < 480$	B
Exam II	100 pts	$360 \leq pts < 420$	C
Project	100 pts	$300 \leq pts < 360$	D
Final Exam	150 pts	$pts < 300$	F

  Scholastic Dishonesty: The Aggie Code of Honor states that the students at Texas A&M University should value honesty and personal integrity. In this course students can discuss homework assignments and solutions. However, it is NOT permissible to copy homework solutions from another student. It is NOT permissible to discuss any aspect of any test or examination until ALL students have completed the exam. The penalties for violating this policy will range from an F on an assignment or test, to an F in the course.
  ADA Statement: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring any accomodations, please contact the office of Services for Students with Disabilities (SSD), Room 126 of the Koldus Building, or call 845-1637.