

Fayetteville State University
COLLEGE OF ARTS AND SCIENCES
Department of Mathematics and Computer Science
MATH 481-01 Introduction to Topology
Fall 2010

“In case FSU must close for an emergency during the semester, instruction will continue using Blackboard.”

I. Locator Information:

Instructor: Dr. Xin Tang

Course # and Name: Math 481 Introduction to Topology

Semester Credit Hours: 3 hours

Day and Time Class Meets: _____

Total Contact Hours for Class: _____

Office Location: Lyons 120

Office hours: MWF3:00pm-5:00pm & T 10:00am-12:00pm

Office Phone: 910-672-2206

Email address: xtang@uncfsu.edu

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account (studentid@broncos.uncfsu.edu) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail. Rules and regulations governing the use of FSU email may be found at <http://www.uncfsu.edu/policy/general/FSUE-mailFINAL>

II. Course Description: Mathematics 481-Introduction to Topology is a study of topics in the field of point set topology, including general topological spaces, metric spaces, and various topological properties. **PREREQUISITE: MATH 412.**

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability, please contact the Center for Personal Development in the Spaulding Building, Room 155 (1stFloor); 910-672-1203.

IV. Textbook: Baker, Crump W. Introduction to Topology, Krieger Publishing Company, Malabar, Florida 1997.

V. Student Learning Outcomes

Upon completion of this course, students will be able to:

- **Show a basic understanding of Logic and Set Theory**
- **Demonstrate a familiarity with Topological Spaces**
- **Demonstrate an understanding the basic principles of Metric Spaces**
- **Demonstrate the ability to apply concepts of Continuous Functions**
- **Demonstrate knowledge of Connected Spaces**
- **Demonstrate knowledge of Compact Spaces**
- **Demonstrate knowledge of Product Spaces**
- **Demonstrate knowledge of Separation Axioms**

VI. Course Requirements and Evaluation Criteria

Evaluation in the course shall be using continuous assessment. The mode of assessment would include homework assignments, chapter exams, class attendance and participation, and final examination. The grading scale for determining the course grade and weights given to various activities are given below.

- a. A = 90-100% B = 80-89% C=70-79% D=60-69% F=Below 60%
- b. Students are only allowed to miss no more than 3 classes for acceptable reasons.
- c. Homework: 30 points; Tests: 30 points; Final Exam: 20 points; Paper project: 10 points; Class participation: 10 pts.
- d. **No make-up exams or late assignments accepted without instructor's prior permission.**

GENERAL REQUIREMENTS:

- The student is expected to pre-study each lesson in advance, complete all assignments, and spend adequate time on class work to insure success in the course. At least two hours of study is expected for each class hour.
- It is the responsibility of the student to avail himself/herself at all class meetings, and obtain additional help as needed. Consult the University Catalogue on Class Attendance Policy.
- Students are expected to enter the classroom on time and remain until the class ends. **Late arrivals and early departures without appropriate excuses will not be tolerated.**
- Each student is encouraged to participate in class discussion for a clearer understanding and meet with the instructor when additional assistance is needed.

VII. Academic Support Resources – Additional course information or announcement will be posted on [Blackboard](#).

VIII. Course Outline and Assignments

The following Course Outline and Assignments are subject to change if appropriate.

Sections	Topics	Homework
1.1	Topology	
1.2	Sets	2, 4, 11
1.3	Extended set operations	2, 6, 10
1.4	Functions	4, 6, 8, 9
1.5	Images and inverse images of sets	1, 2, 6
2.1	Open subsets of the real numbers	1.(a, b, c, d, e, i, j), 6, 8
2.2	Topological spaces	1, 2, 10
2.3	Closed sets and closure	1, 3, 11
2.4	Limit points, interior points, exterior points, boundary, more on closure	2, 4, 6, 14
2.5	Basic open sets	3, 5, 7
	Exam 1	
3.1	Subspaces	6, 8, 13
3.2	Continuity	3, 4
3.3	Homeomorphisms	3, 7
3.4	The topology of \mathbb{R}^n	
4.1	Products of two Topological spaces	1, 2, 6
4.2	Finite products and projections	2, 4

4.4	Continuity of algebraic operations on \mathbb{R}	3, 4
	Exam 2	
5.1	Connected spaces	1, 3
5.2	Connected subspaces and continuous images of connected spaces	1, 2, 3
5.3	Finite product of connected spaces	1, 2
6.1	Compact spaces	6, 7, 11
6.2	Properties of compact spaces	4, 7
	Exam 3	
7.1	$T_{\{0\}}, T_{\{1\}}, T_{\{2\}}$	2, 3
7.2	Regular spaces	2, 3
7.3	Normal spaces	2, 3
8.1	The metric Topology	1, 4
8.2	Products of metric spaces	5, 13
8.3	Sequences	1, 3
8.4	Complete metric spaces	1, 5
	Final exam	

IX. Teaching Strategies:

The majority of the material of the course will be given in lecture format. There is a short review before and after each lecture. Student discussions, cooperative learning groups will be strongly encouraged

X. Bibliography:

Cain, George L. Introduction to General Topology. Reading, MA: Addison-Wesley Publ. Co., 1994.

Goodman, Sue E. Beginning Topology. Belmont, CA: Thompson Brooks/Cole, 2005.

Munkres, James. Topology. Englewood Cliffs, NJ: Prentice-Hall, Inc., 2000.

Roseman, Dennis. Elementary Topology. Upper Saddle River, NJ: Prentice-Hall, Inc., 1999.

Sieradski, Allan J. An Introduction to Topology and Homotopy. Boston: PWS-KENT Publ. Co., 1992.

An Information Literacy Project for Math 481-Introduction to Topology Fall 2010

1.Task

In this project, each student is required to conduct a search on a famous mathematician who has significantly contributed to field topology, in particular to the topics covered in the class Math 481-Introduction to Topology. As a result, the student is supposed to report his/her findings and conclusion by writing a 4-5 page essay Titled as "A brief Introduction to XXX" and deliver a power-point presentation.

To be credited, the essay and the presentation should consist of the following items:

- 1.1. A brief biographical sketch of the selected mathematician.
- 1.2. A brief but concise summary or outline of his/her contributions to the field Topology.
- 1.3. An exploration of the connections between the mathematician's works and the topics covered in Math481-Introduction to Topology.
- 1.4. Appropriate conclusions or comments based the information you obtained.
- 1.5. A detailed reference list.

In particular, some concrete examples should be included to make these concepts accessible a general audience. Information literacy shall be incorporated in this project.

2. Objectives: The following objectives shall be achieved (with an emphasis on Information Literacy Standards):

Objective 1: Students are expected to learn how to find needed information via a variety of search methods. Most importantly, the students will learn how to evaluate the information, analyze the information, and draw their own conclusions. [Information Literacy Standards 1.1, 1.2, 1.3, 2.1, 2.3, 2.4]

Objective 2: Students are expected to identify the connections between the mathematician's contributions and the topics covered in class, and therefore deepen their understanding of these topics. Students are expected to identify positive lessons from the experiences learned from the mathematicians' careers, which could help shape the students' views toward mathematics research. [Information Literacy Standards 3.1, 3.2, 3.3]

Objective 3: Students are expected to incorporate professional writing and presenting skills in this project Students are expected to improve their research skills through the process of collecting, digesting and analyzing information, thus improve their research readiness. [Information Literacy Standards 4.6, 5.1, 5.2]

Objective 4: Information literacy standards shall be incorporated as stated in the Objectives 1-3.

3. How does the instructor grade your paper?

You paper will be graded based on the following criteria:

Criterion 1: All the objectives should be appropriately addressed in your paper.

Criterion 2: Your ideas should be precisely stated and they make senses to a general public audience. Most importantly, your ideas are supported by the concrete examples, data and other evidences which you provide.

Criterion 4: The contents of your paper are organized in a consistent and logical way. The flow of the ideas should be smooth.

Criterion 5: The references used in your paper should be clearly and accurately cited.

Criterion 6: You paper should be readable. You should try to avoid any grammar or spelling errors. Use the grammar check before you turn in your paper. And your paper should meet the minimum 4-5 page requirement. **Plagiarism SHALL NEVER BE TOLERATED.**

4. Resources you can use:

4.1. Resources from Fayetteville State University Chesnut Library.

4.2. You should take advantage of the software **Smarthinking** (you can access it through [Blackboard](#)) and the [FSU Writing Center](#).

4.3. You can find more tips on writing at the WAC website: www.uncfsu.edu/univcoll/wac.

4.4. You can use any related useful resources available online. Please make sure that you do evaluate the information and cite them appropriately.

4.5. You may consult your instructor for help: You will be surprised that he is willing to listen to your own ideas!