

SET THEORY & TOPOLOGY 10AM MWF SPRING 2018 SH309

- Instructor: Jonathan White
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- Office: Stuart 316
- Office Hours: 9:30-9:50am and 11:00-11:30am MWF and by appointment
- Office Phone: 399-8280
- Home Phone: 362-3350 (between 7am and 10pm)
- Text: *Introduction to Topology*, Crump Baker
- Participation: Successfully presenting an exercise will earn 1 point. Occasional quizzes will earn up to 2 points each. Unexcused absences deduct 5 points. Up to 150 points are possible.
- Problem Sets: Several problem sets will be assigned through the term, with high standards for both mathematics and formatting (i.e., \LaTeX). 200 points are possible.
- Math Culture: Up to 50 Math Culture Points may be earned by participating in various activities outside of class, as detailed on page 3 of this syllabus.
- Exams: There will be a midterm exam worth 100 points and a final exam worth 200 points, with their dates listed in the schedule on page 2 of this syllabus.
- Grading: Grading will approximately follow a $[92.0\%, +\infty) \rightarrow A$, $[90\%, 92\%) \rightarrow A-$, $[87\%, 90\%) \rightarrow B+$, $[82\%, 87\%) \rightarrow B$, $[80\%, 82\%) \rightarrow B-$, $[77\%, 80\%) \rightarrow C+$, $[72\%, 77\%) \rightarrow C$, $[70\%, 72\%) \rightarrow C-$, $[67\%, 70\%) \rightarrow D+$, $[62\%, 67\%) \rightarrow D$, $[60\%, 62\%) \rightarrow D-$, $(-\infty, 60\%) \rightarrow F$ scale.
- Makeups: For fairness to those who follow the schedule, makeups for exams will be allowed only in extenuating circumstances, with documentation and advance notice when humanly possible. Late problem sets will be penalized 20% of points possible for each day late, and only accepted until others are returned.

A first course in topology serves as an ideal capstone for an undergraduate mathematics major. The material can proceed in a clear axiomatic progression, and can appear to be entirely abstract, but eventually sheds much light on a wide range of other areas of mathematics and applications. The real benefits of such a course do not come from passively receiving content from others, but instead from struggling with difficult ideas yourself. This course is designed to encourage (or force?) that. Thus, class time will be devoted almost entirely to students presenting the exercises from the textbook to the class. Proper notation and careful attention to detail will be expected at all times.

This course will give a traditional introduction to point-set topology, followed by a brief look at the fundamental elements of algebraic topology.

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Tentative Schedule

1/8 Chapter 1 Review	1/10 §2.1 Open Subsets of \mathbb{R}	1/12 §2.2 Topological Spaces
1/15 No Class – MLK Day	1/17 §2.3 Closed Sets and Closure	1/19 §2.4 Limit Points
1/22 §2.4 Int, Ext, Bd	1/24 §2.5 Basic Open Sets	1/26 Chapter 2 Review
1/29 §3.1 Subspaces	1/31 §3.2 Continuity	2/2 §3.3 Homeomorphisms
2/5 §3.3 Homeomorphisms	2/7 §3.4 \mathbb{R}^n	2/9 Chapter 3 Review
2/12 §4.1 Pairwise Products	2/14 §4.2 Finite Products	2/16 §4.3 Arbitrary Products
2/19 §4.4 Continuity of Operations	2/21 Chapter 4 Review	2/23 §5.1 Connectedness
2/26 § 5.2 Connected Subspaces	2/28 §5.3 Connected Products	3/2 Midterm Exam
No Class – Spring Break		
3/12 §5.4 Connected Inf. Products	3/14 Chapter 5 Review	3/16 §6.1 Compactness
3/19 6.2 More Compactness	3/21 Chapter 6 Review	3/23 §7.1 T_0, T_1, T_2
3/26 §7.2 Regular Spaces	3/28 §7.3 Normal Spaces	3/30 Chapter 7 Review
4/2 §8.1 Metric Spaces	4/4 §8.2 More Metric Spaces	4/6 §8.3 Sequences
4/9 §8.4 Complete Metric Spaces	4/11 Chapter 8 Review	4/13 Croom §9.1 Algebraic Topology
4/16 Croom §9.1 Algebraic Topology	4/18 Croom §9.2 Fundamental Group	4/20 Croom §9.3 $\Pi_1(S_1)$
4/23 Croom §9.4 More about Π_1	4/25 Review	
Final Exam – 8am Friday 4/27		

Any students with disabilities which might affect their performance in this class should contact me as soon as possible to arrange accommodations.

Coe's faculty has adopted an academic integrity policy. It is your responsibility to understand and follow it.

Diversity, in all its forms, is valuable.

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Math Culture Points

A portion of the grade for this course will take the form of Math Culture Points. These will be earned through activities outside of class including, but not necessarily limited to, those listed below. Note that none of these are mandatory – there are far more opportunities than necessary to earn full credit. You should be able to select activities that are particularly relevant to you.

Activity	Points	Max #
Colloquium Attendance	5	
Colloquium Presentation	5-15	2
Meeting Attendance		2
Midwest Undergraduate Mathematics Symposium (4/6-7)	15	
Nebraska Conference for Undergraduate Women in Mathematics (1/26-28)	15	
SIGCSE Technical Symposium (?)	15	
University of Iowa Computing Conference (?)	15	
Hack-a-thon (?)	15	
Math Culture Reading		
Some weeks specific readings will be posted on Moodle	5	–
Articles from <i>Math Horizons</i>	5	3
With approval, articles from <i>Math. Magazine</i> , <i>The College Math. Journal</i> , etc.	5	3
Math Club Activities (when appropriate)	5-10	5
Winter Break Book Discussion, Movies, Pi Day Celebration, Workshops, etc.		
Other Appropriate Coe or Outreach Activities		
Contemporary Issues Forum (?)	5	–
Chess Club Meeting	5	4
Attending a Quantitative Research Symposium Presentation	5	3
Job Shadowing in any relevant field	10	1
Working with students at McKinley Middle School, etc. (see Jon)	5	5

You should plan to spread your participation through the semester. In each case, credit assumes both full participation and posting a brief summary/response on Moodle **in a timely manner**. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event, and **must be submitted within one week of the event**, or within the specified time window for other activities. Up to three units of credit may be submitted after normal deadlines in the “Math Culture – Late” category on Moodle, but otherwise exceptions will not be made without serious extenuating circumstances.