University at Buffalo

MTH 427/527 Introduction to Topology I
Syllabus - Fall 2021

Course Website: www.mth527.site.
Please refer to the course website for an up-to-date version of this syllabus and all course materials.

Lectures: Tue, Thu 2:20 - 3:35 PM Clemens Hall 19.

Recitations: Thu 7:05 - 7:55 PM Math Building 250
Recitations are meant primarily for students taking MTH 427, but anyone interested can participate.

Instructor: Bernard Badzioch
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Office Hours: Fri 5:00 - 7:00 PM Math Building 108

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Office Hours: TBA

Prerequisites: This is an abstract, proof based course. I will assume that you have experience with mathematical proofs and you know how to read and write them. All homework and exam problems will ask you to prove various statements on your own. The main technical prerequisites come from calculus: you should be comfortable with the notions of a continuous function (of one and several real variables) and a limit of a sequence of real numbers. Prior knowledge of operations on sets (union, intersection, difference, product) is also expected, but I will review this at the beginning of the course.

Learning outcomes: After completing this course student should be able to:
• Understand the notions of a metric space, topological space, subspace, product space, quotient space, topological manifold and provide examples illustrating each of these notions.
• Understand the notion of a continuous function between topological spaces and a homeomorphism, and be able to recognize if a given function is continuous and if it is a homeomorphism.
• Understand basic topological properties: metrizability, compactness, connectedness, path connectedness, separation axioms etc. Understand various connections between these properties and be able to provide examples of topological spaces that satisfy or do not satisfy these properties.
• Prove or disprove statements concerning topological spaces and continuous functions.

Textbook: The course will follow lecture notes posted on the course website. If you would like to use a published text as a supplement, a popular and good textbook is e.g. Topology by J.R. Munkres. There are many other good options. You can check with me if you would like to use some other book.

Grading:
Homework: 30%
Midtem Exam 1: 15%
Midtem Exam 2: 15%
Class participation: 10%
Final Exam 30%

Homework: Homework problems will be assigned weekly, and will be due on Friday each week. Students registered for MTH 527 are required to submit homework solutions typeset in LaTeX. MTH 427 students will receive one bonus point for each homework problem solution prepared in LaTeX (solutions that show no mathematical effort do not count). I will give a brief introduction to LaTeX during the first week of the course.

You can collaborate on homework problems, but you must write solutions entirely on your own. Copying solutions from other students or any other sources is a violation of the UB academic integrity policy.

Homework assignments will be collected and returned through Gradescope. I will explain in class how to use it.

Class participation: Class participation credit will be based on two components**.**

- **Class attendance.** You can earn up to 5% of the total course credit for being present and on time during class meetings. You can miss one class meeting without a justified reason. Each subsequent unexcused absence will lower your participation credit by 1% (i.e. from 5% to 4% etc.).

- **Weekly digest.** As a part of each homework you will be asked to submit a short (2-3 sentences) writeup on your study from the previous week For example, you can write:
  - what topics you have found interesting (or boring)
  - what topics you have found difficult (or easy)
  - how you feel about the course
  - anything else you want to share.

You will be also asked to submit questions that you would like to see discussed during a class meeting.

You can receive up to 5% credit for these writeups. You can miss one such assignment without loosing any credit, but your weekly digest credit will be lowered by 1% for each subsequent missed assignment.

I may award extra credit to students who are especially active in the course. I may also offer some extra credit opportunities for giving short presentations on some topic etc.

Exams:
- **Midterm Exam 1.** Thursday, October 7, 2:20 - 3:35 PM Clemens Hall 19.
- **Midterm Exam 2.** Thursday, November 11, 2:20 - 3:35 PM Clemens Hall 19.
- **Final Exam**. Tuesday, December 14, 3:30 - 6:30 PM Clemens Hall 19.

Incomplete Grades: See the UB Catalog for the UB Incomplete Grades Policy.

Academic Integrity: See the UB Catalog for the UB Academic Integrity Policy.

Accessibility Resources: If you need accommodations due to a physical or learning disability please contact the UB Accessibility Resources Office to get help with making appropriate arrangements.