

MATH 4500 - Introduction to Toplogy - Section 001
MATH 5600 - Topology - Section 001
Spring 2012

Instructor: Dr. Farmer Schlutzenberg

Contact Details:

Email: farmer@unt.edu

Office: 416 GAB.

Office Hours: Times for now (subject to change): Monday 2-3; Tuesday 1-3; Wednesday 2-3.

Class meets: 11am-12:20pm, Tuesday, Thursday, 210 Curry Hall.

Final Exam Date and Time: 10:30am - 12:30pm, Thursday, May 10. Usual classroom.

Class Website: math.unt.edu/~farmer/4556.html

Course Outline: (3 hours). Point set topology; connectedness, compactness, continuous functions and metric spaces.

Prerequisite (4500): A passing grade in Math 3610 or the equivalent. It is the responsibility of the student that the prerequisite is satisfied. Students that do not meet the prerequisite will be allowed only the first week of classes to be moved from one class to another. A grade of F, W or WF may be assigned to students enrolled in the course who do not meet the prerequisite, irrespective of their work.

Prerequisite (5600): Consent of the math department.

Text: *Topology, 2nd Ed.*, by James R Munkres. You should have access to this book.

UNT Policies on Student Rights and Responsibilities: See the Center for Student Rights and Responsibilities (CSRR), on the web at <http://conduct.unt.edu/>, for university wide policies.

Responsibilities of Student:

- You are expected to read and understand the contents of this syllabus, and remain informed about any changes to this syllabus throughout the semester. Any changes to the syllabus will be indicated on the class website, and reflected in the syllabus available there. If you do not understand something in the syllabus, you are expected to ask me for explanation.
- You should ensure now that you will be able to attend class for each exam. If you foresee a problem, talk to me about it ASAP. If you miss an exam without making arrangements beforehand, then except in exceptional circumstances, you will receive a score of 0 for that exam.

- You are expected to learn and understand the material covered in classes, assigned readings, handouts and assigned problems (for credit or not).
- You are responsible for obtaining all handouts.
- You are required to conform to the student code of conduct, which you should be familiar with. (In the CSRR website, <http://conduct.unt.edu>, click the “Student Conduct” tab and then click the “Code of Conduct” link; alternatively, just go here: http://conduct.unt.edu/sites/default/files/pdf/code_of_conduct.pdf).
- You are required to conform to the university’s standards of academic integrity. You should be familiar with the university’s policy on this. (Available here: http://policy.unt.edu/sites/default/files/untpolicy/pdf/7-Student_Affairs-Academic_Integrity.pdf. For more information see the Office of Academic Integrity’s website: <http://vpaa.unt.edu/academic-integrity.htm>.)

Grading:

- To gain full credit for your solution to a problem, you must show all reasoning, unless the problem states explicitly that you needn’t do so.
- All work should be written carefully and legibly, with sufficient spacing. Work that I find too hard to read may be not graded, and given a score of 0.
- The grade of “I” (Incomplete) can, given the right conditions, be assigned to a student who is passing, but unable to complete the remainder of the semester’s work. Before asking about this, read the “Incomplete grade information policy”, which is linked to on the Registrar’s website <http://essc.unt.edu/registrar/index.html>.
- The for-credit work includes the final exam, midterms 1 and 2, homework and homework discussion.
- There are two options for how your total score will be computed. I will calculate your score with both options, and you’ll automatically get the better of the two. The break-downs are below.

Option 1:

- MT1: 23%
- MT2: 23%
- Final Exam: 32%
- Homework: 16%
- Homework discussion: 6%

Option 2:

- MT1: 14%
- MT2: 14%
- Final Exam: 58%
- Homework: 10%

- Homework discussion: 4%

Letter grades will be determined essentially according to the following guidelines ¹:

- A: $\geq 85\%$
- B: $\geq 75\%$
- C: $\geq 60\%$
- D: $\geq 50\%$
- F: $< 50\%$

Announcements: Course announcements affecting any aspect of the course, including changes to this syllabus, may be made in class. It is the student's responsibility to be informed of any such announcements.

In Class:

- Music players, etc., are to be switched off.
- Laptop computers may be used for note taking purposes only.
- No cell phones ringing.
- You are expected to make your best effort to arrive on time. If you run late occasionally due to unforeseen circumstances, that's okay, just be quiet when you come into class.
- If you anticipate needing to arrive to class late or leave early, please let me know beforehand. Please be courteous of others as you do so.
- You are expected to conform to the UNT student code of conduct (available here: http://conduct.unt.edu/sites/default/files/pdf/code_of_conduct.pdf).

Readings: Some significant material for the class will not be explicitly covered in class, but assigned as reading for homework.

I also suggest reading ahead on material we plan to cover in class, where possible. If you are confused or have questions, you are invited to bring them up in class. Reading *and* hearing about the material will very probably help you understand better than just doing one alone, and getting a different perspective will help also. (I can't guarantee that we will follow precisely what's in the schedule, and it may change from time to time. Asking me or consulting the most recent version of the syllabus will generally give you a fairly good idea of what's coming up.)

Exams:

- Exam schedule (all held in usual classroom):

¹For each midterm and the final exam, you'll be assigned a letter grade, roughly according to the given scale. However, the exact scale used on each test may vary a little from the given scale. It will only vary in a direction in favour to the student, so that if you get 75% on a test, you'll definitely get (at least) a B for that test. But it won't vary that far from the given scale.

- Midterm Exam 1: 11am, Thursday, Feb 23.
- Midterm Exam 2: 11am, Thursday, April 5.
- Final Exam: 10:30am, Thursday, May 10.

If you know of some reason now that you can't make one of these dates, talk to me about it ASAP.

- *Examinable material:* All material covered in the course prior to a given test is examinable in that test. The final exam will be very comprehensive in that it will explicitly contain questions relating to many (or all) parts of the course. The midterms and quizzes will focus more on the material more recently covered. All material covered in classes, in assigned readings or problems (whether for credit or not), and in non-administrative handouts, is examinable. Also, some questions in tests may be generalizations or variations of that material. So some test questions may not look like questions that have come up previously in the class.
- *Rules for tests:*
 - All electronic devices are to be put away during tests.
 - Everything written on your test must be *your own work*.
 - You must follow the rules listed under “Academic Integrity” below.
 - Exams will be handed out closed. Students may only open exams when instructed to do so.
 - Each exam will run for a certain prescribed length of time. The remaining time will be made clear in the classroom. It is the student's responsibility to hand in their exam to me, at the front of the room. There will be a 1 minute grace period after the official end of the exam in which exams may be handed in, without attracting a penalty. Exams handed in at least 1 minute late will receive a penalty of $5t$ percentage points, where $t \geq 1$ is the number of minutes the exam is late. (So, for example, an exam handed in 58 seconds late receives no penalty. An exam handed in 60 seconds ($t = 1$ minute) late receives 5% penalty. An exam handed in 150 seconds ($t = 2.5$ minutes) late receives 12.5% penalty, etc. The % reduction is relative to the maximum number of points available in the exam, so for example, if the exam has a maximum score of 50 points, and a student hands their exam in 2.5 minutes late, then the penalty is 12.5%, so $0.125 * 50 = 6.25$ points, so their total score would be reduced by 6.25 points as a result.)
 - Exams may have further policies written on their front page.

Academic Integrity: You are required to conform to the university's standards of academic integrity. You should be familiar with the university's policy on this. (Available here: http://policy.unt.edu/sites/default/files/untpolicy/pdf/7-Student_Affairs-Academic_Integrity.pdf. For more information see the Office of Academic Integrity's website: <http://vpaa.unt.edu/academic-integrity.htm>.)

During exams:

- Everything written in your tests (exams and quizzes) must be your *own work*. Cheating is a serious offence, and will be treated as such.
- Do not look at other people's exams, and do not attempt to communicate with any other student while taking the exam.
- Do not attempt to access external sources of information during an exam. This includes any written text you have brought into the exam, and any use of electronic devices.
- Follow the other rules listed in the "Exams" section above.

Homework:

- Homework is an essential part of the course. Completing the homework is essential to developing your understanding of the material, and so to your ability to perform well in tests. See the homework guidelines handout on the website for more information.
- Assignments will be announced on the course website.
- Completed assignments should be given to me in class or at my office.
- Work exceeding one page should be stapled or attached with a paper-clip or binder.
- It is permitted, and you are encouraged, to discuss and work on homework problems with other students in the class. But you must write your solutions up yourself, in your own words. It is not permitted to not make any effort to solve a problem, and then just copy another student's written solution. All homework solutions must be handwritten.
- You are encouraged to study Munkres and other books on topology on the list on the course website, while you work on the homework.
- You are highly encouraged to talk to me about the homework and any material in the course. If you are stuck on some problems, I will be glad to talk with you about them.
- You are not permitted to refer to sources (people or text) which provide solutions to the problems (except in special cases where solutions might appear in one of the sources mentioned above).
- In the case that one of the textbooks listed on the course website provides a solution to a homework problem, I suggest that you attempt to solve the problem before consulting its solution there, in your own interest.

Homework discussion: You will be required to meet with me 5 times during the semester, to discuss or present a solution to a homework problem. Each homework set will have certain problems indicated, from which you can choose any problem. You don't need to have a solution to the problem in order to get full credit for the discussion, but you should have thought about it and made a good effort to solve it, and be prepared to discuss the problem and what you have tried, without reference to what you have written. If you have a full solution, that's great. Each meeting should last around 10 minutes. If you get

done early I will ask you about other problems of my choosing. (And if I'm not otherwise busy, we can certainly meet for longer if you want to discuss other things too.)

Disability Accommodation: The Department of Mathematics cooperates with the Office of Disability Accommodation to make reasonable accommodations for qualified students with disabilities.

It is the responsibility of students with certified disabilities to provide the instructor with appropriate documentation from the Dean of Students Office.

Any assistance/tools used by student, outside of those used by all students in the class, must be explicitly stated, in written form, in the documentation provided by the Office of Disability Accommodation. For example, if you make use of a computer whilst taking exams, then the precise software, and functions of that software, which you will make use of during examinations, must be agreed upon by me, in written form, with my signature, beforehand.

Student Evaluation of Teaching Effectiveness (SETE): SETE is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching.

Approximate Class Schedule

The following schedule will probably change.

Tue 1/17: Set notation, open subsets of \mathbb{R}

Thu 1/19: Closed subsets of \mathbb{R} , metric on \mathbb{R}

Tue 1/24: Metric spaces

Thu 1/26: Metric spaces

Tue 1/31: Sequences, limits

Thu 2/2: Continuity

Tue 2/7: Topological spaces

Thu 2/9: Topological spaces, closure, interior, boundary

Tue 2/14: Continuity, Bases

Thu 2/16: Bases, Subspaces

Tue 2/21: Product, quotient topology

Thu 2/23: MT1

Tue 2/28: Connectedness

Thu 3/1: Connectedness

Tue 3/6: Compactness

Thu 3/8: Compactness

Tue 3/13: Compactness

Thu 3/15: Cardinality

Tue 3/20: — (Spring break)

Thu 3/22: — (Spring break)

Tue 3/27: Countability, separation axioms

Thu 3/29: Separation axioms

Tue 4/3: Separation axioms, Review

Thu 4/5: MT2

Tue 4/10: Density, separability

Thu 4/12: Property of Baire

Tue 4/17: Property of Baire

Thu 4/19: Urysohn

Tue 4/24: Tietze

Thu 4/26: Tychonoff

Tue 5/1: Tychonoff

Thu 5/3: Review; last day of class.

Tue 5/8: —

Thu 5/10: Final Exam, 10:30am-12:30pm