

## Math 300, Fall 2017



**Class Meeting Times:** 12:30-1:45PM TR, 1212 ML

**Instructor:** Alan Wiggins

**Office:** 2064 CB

**Office Phone:** 313-593-5228

**Office Hours:** TBD; by appointment

**Website:** <http://www-personal.umd.umich.edu/~adwiggin/>

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**Course Mentor:** Timothy Hollman

**e-mail:** [thollman@umich.edu](mailto:thollman@umich.edu)

**Mentoring Hours:** TBD

**Textbook:** Sundstrom's *Mathematical Reasoning: Writing & Proof*

**Course Description and General Policy:** Math 300 is the “bridge” course to proof-based mathematics. It emphasizes logical reasoning from accepted principles rather than rote computation. Topics covered will include basic logical structure, axiomatic systems, methods of proof, set theory, functions, equivalence relations, and basic number theory, algebra, analysis, and topology. **NOTE:** this is a proof-based course! Be prepared to work very, very hard.

**About This Class:** I plan on devoting days without an exam either mostly or wholly to in-class group work on worksheets of my design. The worksheets will direct you to the sections of the book that you should examine BEFORE the following class. If the entire class seems confused on a particular topic, I will utilize the black-or-white boards, but **THERE WILL BE FEW LECTURES!** Do not expect this to be a class where you can hide in a corner and text the whole session while the instructor drones on.

**Attendance:** Here is the official spiel: A student is expected to attend every class and laboratory for which he or she has registered. Each instructor may make known to the student his or her policy with respect to absences in the course. It is the student's responsibility to be aware of this policy. The instructor makes the final decision to excuse or not to excuse an absence. An instructor is entitled to give a failing grade (E) for excessive absences or an Unofficial Drop (UE) for a student who stops attending class at some point during the semester.

Here is my spiel: Attendance for lectures is your responsibility.

**Exams:** There will be two in-class exams worth 70 points each. The final exam, worth 140 points, will be in-class and is scheduled for Thursday, December 14th from 11:30AM-2:30PM

**Assignments:** There will be 8 homework assignments worth 25 points each. Homework will be posted semi-weekly under “Assignments” on Canvas (<https://canvas.umd.umich.edu>). You may turn in one homework assignment late without penalty and without excuse, but you must do so BEFORE I have graded and returned it to the class. A further  $n$  number of late homework will only be accepted before I grade and return that homework, and will result in a  $5n$  point penalty for each natural number  $n$ . For each homework assignment, you can earn up to 2 points of extra credit by using LaTeX to write up your work.

**Reading Quizzes:** There will be an online reading quiz before each class during which new content will be covered. Each one will be worth a measly one point- but those points add up! There will be 20 points worth of reading quizzes.

**Grades in General:** The recap:

Reading Quizzes	20 points
Assignments	200 points
Midterm 1	70 points
Midterm 2	70 points
Final	140 points

Grades will be determined in the following manner: an A is greater than or equal to 425 points, a B between 350 and 424, a C between 275 and 349, etc.

**Tentative Course Outline:** Nothing is set in stone!

Week Two	Sections 1.1,1.2,5.1
Week Three	Sections 2.2,2.3,2.4
Week Four	Sections 3.1,3.2,7.2
Week Five	Sections 3.3,3.4,6.1
Week Six	Review & Midterm
Week Seven	Sections 4.1,5.2,6.3
Week Eight	Sections 4.2,4.3,5.3,6.2
Week Nine	Sections 6.4,6.5,8.1
Week Ten	Sections 6.6,8.2,6.5
Week Eleven	Sections 6.6,7.1,7.2
Week Twelve	Review & Midterm
Week Thirteen	Sections 7.3,7.4,8.1
Week Fourteen	Sections 8.2,8.3,9.1
Week Fifteen	Sections 9.2 & 9.3

**Office Hours:** Feel free to drop by my office if you would like to discuss anything even remotely mathematically related. I am extremely happy to talk to anyone during my scheduled office hours, but if you find you cannot make these times and would like to talk with me, I am equally happy to make an appointment to see you.

**Studying:** Please, please, PLEASE try to make a habit of studying with other students in this or any other course. I cannot over-exaggerate how discussing problems and concepts with other people can help you figure out what you do and do not know. However, if you choose to collaborate with other students on an assignment, the first instance of an embarassingly egregious mistake will be met with an  $x$ -point penalty, a duplication with a  $2x$ -point penalty, a further duplication with a  $4x$ -point penalty, etc. In short: don't mindlessly copy other people's work.

**Additional Resources:** If you can get your hands on the following texts, they may be of use to you, either for providing more examples or for explaining the topics in a way you find more pleasing:

1. Chartrand's *Mathematical Proofs: A Transition to Advanced Mathematics*: the most popular book used in "bridge" courses. Precise, staid, and absolutely despised in some circles.
2. Morash's *Bridge to Abstract Mathematics: Mathematical Proof & Structure*: Ron Morash was a professor at UM Dearborn for decades, and taught this very course out of this very book.

3. Houston's *How to Think Like a Mathematician*: the text used in Michigan State's "bridge" course, whose structure is quite similar to ours. Conversational, scattered, and almost the polar opposite of Chartrand.
4. Polya's *How to Solve It*: an introductory book on thinking by one of the greatest problem-solvers and communicators in the history of mathematics.
5. Gerstein's *Introduction to Mathematical Structures and Proofs*: the text used for this course last year. Somewhere closer to Chartrand than Houston on the spectrum of formality and with a pronounced emphasis on number theory.

**Academic Integrity Policy:** The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth by the Code of Academic Conduct

<https://umdearborn.edu/about/policies/academic-code-conduct/>

as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses and violations can result in penalties up to and including expulsion from the University.

**Student Rights and Code of Conduct:** Please see

<https://umdearborn.edu/students/registration-records/policies/student-rights-code-conduct> for information regarding this topic. If you at any time need assistance from campus safety, their number is 313-593-5333.

**Accommodation Procedure:** The University will make reasonable accommodations for people with documented disabilities. Students need to register with Disability Resource Services (DRS) every semester they are enrolled for classes. DRS is located in Counseling & Support Services, 2157 UC. To be assured of having services when they are needed, students should register no later than the end of the add/drop deadline of each term. If you have a disability, please inform me as soon as possible. You must inform me of any disability at least a week before any exam in order to receive the proper accommodations. Please see <https://umdearborn.edu/students/disability-services> for more information.

**Departmental Learning Goals:** The Department of Mathematics and Statistics Learning Goals for its classes are enumerated below.

1. Increase students' command of problem-solving tools and facility in using problem-solving strategies, through classroom exposure and through experience with problems within and outside mathematics.
2. Increase students' ability to communicate and work cooperatively.
3. Increase students' ability to use technology and to learn from the use of technology, including improving their ability to make calculations and appropriate decisions about the type of calculations to make.
4. Increase student's knowledge of the history and nature of mathematics. Provide students with an understanding of how mathematics is done and learned so that students become self-reliant learners and effective users of mathematics.

**Math 300 Learning Goals:** In Math 300, students will be expected to learn, understand, and communicate definitions, examples, fundamental theorems and applications relevant to the study of higher mathematics. Students will increase their ability to analyze, develop, and communicate rigorous mathematical proofs of statements. They will improve their mathematical communication by developing clear proof writing skills and presenting their work to their peers. To increase student's knowledge of the nature of mathematics, students will improve their reading comprehension of advanced mathematical texts.

**In Case of Emergency:** All students are encouraged to program 911 and UM-Dearborn's University Police phone number (313) 593-5333 into personal cell phones. In case of emergency, first dial 911 and then if the situation allows call University Police.

The Emergency Alert Notification (EAN) system is the official process for notifying the campus community for emergency events. All students are strongly encouraged to register in the campus EAN, for communications during an emergency. The following link includes information on registering as well as safety and emergency procedures information:

<http://umdearborn.edu/emergencyalert/>

If you hear a fire alarm, class will be immediately suspended, and you must evacuate the building by using the nearest exit. Please proceed outdoors to the assembly area and away from the building. Do not use elevators. It is highly

recommended that you do not head to your vehicle or leave campus since it is necessary to account for all persons and to ensure that first responders can access the campus.

If the class is notified of a shelter-in-place requirement for a tornado warning or severe weather warning, your instructor will suspend class and shelter the class in the lowest level of this building away from windows and doors.

If notified of an active threat (shooter) you will Run (get out), Hide (find a safe place to stay) or Fight (with anything available). Your response will be dictated by the specific circumstances of the encounter.

### **Important Dates:**

- Last day to register for, withdraw from, or drop/add classes with no penalty: Tuesday, September 19th (some classes can only be added until the 13th)
- Fall Break: Monday, October 16th and Tuesday, October 17th
- Last day to withdraw completely and still get some money back: Thursday, October 19th
- Last day to drop individual classes: Thursday, November 10th
- Thanksgiving Break: from 5:00 Wednesday, November 22nd to Sunday, November 26th
- End of Fall classes: Tuesday, December 12th.
- Final Exams: Thursday-Wednesday, December 14th-20th.

**Signoff:** I hope you all enjoy and learn from this course. If you have any suggestions regarding course content or structure, please feel free to make them at any time.