Introduction to Mathematical Reasoning
Math 301 Section 2
3 Credits
Fall 2018

Meeting Times: MWF 10:10-11:00
Location: Todd 304

Text: *Book of Proof*, by Richard Hammack. This is an open source Book and a link will be provided via Blackboard, so there is no requirement to purchase a hard copy.

Instructor: Prof. Matt Hudelson
Office Hours: TBA (in the Math Learning Center)

Office: Neill 330, Phone 335-3125
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Prerequisites: Math 220 (introductory linear algebra) or equivalent with a C grade or better.

Course management: This course will be managed through Blackboard (learn.wsu.edu) and a Dropbox folder will be used to house documents (such as the textbook and course notes). A link to a Prezi form of this syllabus will also be in Blackboard.

Anticipated Coverage

Block	Weeks	Topics	Textbook Coverage
Sets and Logic	1-3	Sets and elements, Venn diagrams, Set operations, Propositional logic, Boolean algebra, Implications and rules of inference, Predicate logic	Chapter 1 Chapter 2
Proving Theorems	4-6	Direct proofs, element chasing Indirect proof, cases, counterexamples	Chapter 4, Chapter 8 Chapters 5,6,7,9
Mathematical Induction	7-8	Weak induction, recurrences Strong induction and smallest counterexample style arguments	Chapter 10
Relations	9-10	Relations, RST properties, Equivalence relations and equivalence classes	Chapter 11
Functions	11-13	Functions, Injection, Surjection, Bijection Cardinality, Countability, Uncountability	Chapter 12 Chapter 13
Open Sets	14	Open intervals, Neighborhoods, Open and Closed Sets	External Material

Learning goals: To gain facility…

1. … in reasoning mathematically. Progress toward this learning goal will be assessed through homework assignments and the examinations.
2. … in communicating mathematical ideas effectively. Progress toward this learning goal will be assessed through homework assignments and the examinations

Course overview: This course is intended as an intensive introduction to mathematical reasoning and, by extension, mathematical communication in general. We will examine how mathematical writing is typically structured, review the fundamentals of propositional logic, examine various structures of mathematical proofs, and explore how all of this is used across a variety of standard mathematical settings. This course is intended to introduce students to concepts that are widely used in subsequent 400-level courses.

If a "beyond your control" situation arises where you must miss class for three or more consecutive class meetings or you are prevented from completing more than one assignment, please consult with me so that appropriate adjustments (such as prorating grades) can be made. I will award an incomplete only if you are prevented from completing five or more consecutive assignments or the final exam under circumstances beyond your control.

Exams: There will be three exams, each worth 15% of the total course grade. These will be in-class (50 minutes long) and occur during week 7 (covering weeks 1 through 6), week 11 (focusing on weeks 7-10), and the final exam week (focusing on weeks 11-15). They will not be multiple-choice style exams.

Grading:

The periodic homework sets will count for 55% of the final grade and each exam will count for 15%. As every student now has access to Office 365, I will require that assignments be typeset (perhaps using LaTeX or equation editor in Word; drawings may be done by hand and scanned) and submitted electronically through Blackboard by 5:00 PM on the due date. I will award points for each problem set and take the average of these when computing final grades. Final course grades will be awarded on the following scale:

Interval (in percent)	Grade
[90,100]	A
[87,90)	A–
[83,87)	B+
[80,83)	B
[77,80)	B–
[73,77)	C+
[70,73)	C
[67,70)	C–
[63,67)	D+
[60,63)	D
[0,60)	F

Attendance will not be formally taken and will not count toward any portion of the course grade.

Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417; website: http://accesscenter.wsu.edu, email address: Access.Center@wsu.edu) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.

Academic Integrity: Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly encorced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will receive zero credit for the assignment, will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student Conduct.
Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating:
http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010 . If you have any questions about what is and is not allowed in this course, you should ask the course instructor before proceeding.
If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at conduct.wsu.edu .

Classroom Safety: Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the "Alert, Assess, Act" protocol for all types of emergencies and the "Run, Hide, Fight" response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the FBI's Run, Hide, Fight video and visit the WSU safety portal.