MATH 330—Proof, Set Theory, and Logic
Syllabus—Fall, 2025

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Class: MWF (Videos Posted)
Office: Witmer Hall, Room 321
Location: Online
Office Hours: Zoom, By Appointment

Document Information: This syllabus describes the requirements and procedures for MATH 330—Proof, Set Theory, and Logic. You are responsible for knowing this material, so please read it carefully. Substantive changes will be announced via Blackboard announcement. You will be responsible for any changes. Your continued enrollment in this course is your implicit agreement to abide by the requirements of this class.

Prerequisites: MATH 166 or consent of instructor.

Textbook: *Elementary Set Theory* by Richard Millspaugh. A PDF copy of the book is available free of charge. This can be found under the "Textbook" section of the course Blackboard page.

Course Description: In this class, we will cover the following: Methods of proof, axioms and operations on sets, mathematical logic, relations and functions, development of the natural and real number systems, including field axioms and the completeness axiom for the real numbers.

Course Materials: The materials for this course, both required and optional, are as follows:

Textbook (Required): *Elementary Set Theory* by Richard Millspaugh. A PDF copy of the text can be found, free of cost, in the "Textbook" section of the course Blackboard page.

Calculator (optional): A scientific non-graphing calculator or computer equivalent is permitted, though not required, for this course.

Blackboard: All materials for this course will be posted the the class Blackboard page. Any updates or changes pertaining to the course will be posted as an announcement in Blackboard. Adjust your notification settings so that you receive emails or texts when announcements are posted. You want to be sure that you do not miss updates on assignments or other important information.

To access Blackboard, please go to: http://blackboard.UND.edu and log in with your NDUS Identifier (Username and Password). If you do not know your NDUS Identifier or have forgotten your password, please visit your NDUS account webpage on the University Information Technologies (UIT) website. For technical assistance, please contact UND Technical Support at 701.777.2222, visit the UIT website for their hours, help documents, and other resources, or visit the Knowledge Base for additional supports and information about general tech requirements for students including information about devices, operating systems, software, internet connection, and major-specific tech requirements.

Grading Policy: Your percentage grade is determined by the following:

Category	Points	Sections Covered
Exam I	70 pts (25%)	Ch. 1, Ch.2,
Exam II	70 pts (25%)	Ch. 3, Ch. 4, Ch. 5
Final Exam	70 pts (25%)	Ch. 6, Ch. 7, Ch. 8
Homework	70 pts (25%)	
Total	280 pts (100%)	

You can estimate your letter grade by using the following scale: 90–100% is an A, 80–89% is a B, 70–79% is a C, 60–69% is a D, and 0–59% is an F. Plus/Minus Grades will not be awarded, except in very rare circumstances upon the discretion of the instructor.

Incompletes: It is expected that students will complete all requirements for a course during the time frame of the course. For reasons beyond a student's control, and upon request by the student or on behalf of the student, an incomplete grade may be assigned by the instructor when there is reasonable certainty the student will successfully complete the course without retaking it. The mark "I," Incomplete, will be assigned only to the student who has been in attendance and has done satisfactory work up to a time within four weeks of the close of the semester, including the examination period, and whose work is incomplete for reasons satisfactory to his or her instructor. More information regarding UND's Incomplete policy can be found on the UND "Grading System" webpage.

Exams: All exams, including the final exam, will be administered online. On examinations, you will be given a number of problems (generally, similar to those assigned in the homework) to complete during a fixed time period. To receive full credit on your submission, you are **required** to show **all** of your work in a **neat**, **coherent**, and **mathematically correct** fashion. A make-up exam will only be administered if there is documentation from a proper authority, such as a note from a physician in the case of illness. If you know that you will be unable to complete an exam in the allotted time, please talk to your instructor at least one week before the date the exam will be administered. If you have any questions about the scheduling of the exams, please discuss this with your instructor.

Make-up Exams: If you will not be able to take an exam on the scheduled date and time you must make other arrangements with the instructor well in advance. In cases where proper notification has not been given, or if the reason for missing the exam is not valid, the make-up the exam may be penalized or may not be given.

Homework: Seven written homework assignments will be given during the course of the semester. There is **one deadline** associated to each assignment: the **check date**.

(i) Before the due date on the **check date**, you must submit a either a typed or handwritten and scanned copy of your first attempt at the assignment through the class Blackboard page. Your instructor will verify that you have made what can reasonably be considered to be a good-faith effort to complete the assignment. If you have done so, your instructor will score your assignment accordingly to verify this. If a first draft is not submitted by the check date, you will not receive credit for the assignment.

(ii) After class on the **check date** of each assignment, a solution key to the assignment will be posted on the class Blackboard page. Using the posted solutions, you may check and correct your work as you see fit.

To receive full credit on your submissions, you are **required** to show **all** of your work in a **neat**, **coherent**, and **mathematically correct** fashion. In addition to the course calendar attached to this syllabus, due dates for each assignment will be posted in Blackboard. All times are posted in the Central Time Zone. **Late assignments will not be accepted under any circumstances without a university approved exception.** All assignments for this course must be completed during the course dates.

Extra Credit: Opportunities for earning extra credit may occur throughout the semester at the discretion of the instructor. Extra credit problems may be given in class or occasionally may be offered on exams. Points earned from extra credit may help borderline grades, but do not expect extra credit to significantly change your final score.

Attendance: Viewing lecture videos is not mandatory, but I believe it is very important. If you frequently do not watch the lectures without a good reason and begin to struggle in the course, I will have very little sympathy for you.

Getting Help: One of the most important skills a student can develop is the ability to recognize quickly when they are struggling with some concept in a class. Once you recognize you need help, first check through your materials (such as your textbook or class notes, for example) to see if the answer is there. If you cannot alleviate whatever difficulties you are having yourself, *please seek help.* There are lots of resources available to you.

Study Groups: Meet with some of your classmates and help each other with questions. Learning from your peers is one of the best ways to learn.

Office Hours: My office hours (subject to change as noted above) are listed at the top of this document. Please seek me outside of class if you have any questions, concerns, or would like any additional help with the course material. If these times are not convenient, we should be able to arrange an alternative time. I am here to help you!

UND Services: UND cares about your success as a student and provides a number of services, such as The UND Writing Center, Tutoring and Learning Services, Testing Services, and more. For additional information, visit the UND "Student Resources" webpage.

It is important that you try a variety of different services. If you do not receive the help you need at that time, please try it again or try a different service. Don't by shy–make sure you get the help you need!

Academic Integrity: Academic integrity is a serious matter, and any deviations from appropriate behavior will be dealt with strongly. At the discretion of the professor, situations of concern may be dealt with as a scholastic matter or a disciplinary matter.

As a scholastic matter, the professor has the discretion to determine appropriate penalties for the student's workload or grade, but the situation may be resolved without involving many individuals. An alternative is to treat the situation as a disciplinary matter, which can result in suspension from the University, or have lesser penalties. Be aware that I view this as a very serious matter and will have little tolerance and/or sympathy for questionable practices. A student who attempts to obtain credit for work that is not their own (whether that be on a paper, quiz, homework assignment, exam, etc.) will likely receive a failing grade for that item of work, and at the professor's discretion, may also receive a failing grade in the course. For more information read the Code of Student Life.

Disability Statement: The University of North Dakota is committed to providing equal access to students with documented disabilities. To ensure access to this class and your program, please contact DSS to engage in a confidential discussion about accommodations for the classroom and clinical settings. Accommodations are not provided retroactively. Students are encouraged to register with DSS at the start of their program. More information can be obtained by email (UND.dss@UND.edu) or by phone at (701) 777-2664.

Course Evaluation: Near the end of the semester, you will be asked to complete an online course evaluation form (SELFI). Your feedback on the course is extremely valuable to me. I read my students' comments carefully and use them to improve the course the next time I teach it. When the time comes, please let me know which aspects of the course helped you learn—and which aspects might be modified to help future students learn more effectively. Please note that the course evaluations are anonymous and that I won't see the results until after the grades for the course are submitted, allowing you to provide honest and constructive feedback. Throughout the semester if you have concerns or feedback, please reach out to schedule a time to discuss

UND Syllabi Statements: Additional syllabi statements are provided by the Office of the Provost.

Grading Rubric: The rubric below will be used *as a guideline* when evaluating your written work on homework assignments and exams throughout this course. You should strive to produce written solutions that are clear and well organized, make proper use of mathematical notation and terminology, demonstrate an understanding of the mathematical concepts involved, and result in a correct solution. If you practice these skills while working on your written homework problems, you will be more likely to meet the standard expected of your written work on exams. Please familiarize yourself with this rubric and reference it if ever you feel your work has been unfairly graded.

Characteristics of the Written Work	Qualitative Description	Typical Scoring %
(i) The work is presented in a neat, clear, organized fashion that is complete and easy to follow. (ii) Graphs are correct, complete, carefully drawn and appropriately labeled. (iii) Correct terminology and notation are always used. (iv) The solution shows a complete understanding of the mathematical concepts involved, although it may contain a minor arithmetic error or sign mistake.	Exceptional	90-100
(i) The work may not be completely clear or well organized, or it may have some steps missing, but it is still possible to follow with little effort. (ii) Graphs are correct and complete, but somewhat carelessly drawn or missing some labels. (iii) Correct terminology and notation are usually used. (iv) The solution shows almost complete understanding of the mathematical concepts and may contain one or two arithmetic or sign errors.	Good	75-90
(i) The work may be unclear, poorly organized, or have several steps missing, but it is possible to deduce the intended method of solution with some effort. (ii) Graphs are partially correct, somewhat carelessly drawn, and may be missing some labels. (iii) Correct terminology and notation are sometimes used. (iv) The solution shows a limited understanding of the mathematical concepts involved, or an almost complete understanding of the mathematical concepts involved, but contains several arithmetic or sign errors.	Fair	60-75
(i) The work is poorly organized or is very incomplete, making it difficult to follow. (ii) Graphs are incorrect, carelessly drawn, or incomplete, and may not be labeled. (iii) Correct terminology and notation are seldom used. (iv) The solution shows a limited understanding of the mathematical concepts involved, and may also contain several arithmetic or sign errors.	Poor	40-60
(i) The work is so disorganized or incomplete that it is very difficult or impossible to follow. (ii) Graphs are not drawn or are completely wrong and not labeled. (iii) There is little or no correct usage of terminology and notation. (iv) The solution shows little or no understanding of the mathematical concepts involved.	Very Poor	0-40

Course Schedule: (Chapters Covered: All)

Week/Day	Su.	Mo.	Tu.	We.	Th.	Fr.	Sa.
Week	24 Aug.	25 Aug.	26 Aug.	27 Aug.	28 Aug.	29 Aug.	30 Aug.
1				Intro, 1.1		1.2	
Week	31 Aug.	1 Sept.	2 Sept.	3 Sept.	4 Sept.	5 Sept.	6 Sept.
2		*Labor Day (No Class)*		1.2		1.3	
Week	7 Sept.	8 Sept.	9 Sept.	10 Sept.	11 Sept.	12 Sept.	13 Sept.
3		1.3		1.3		1.4	
Week	14 Sept.	15 Sept.	16 Sept.	17 Sept.	18 Sept.	19 Sept.	20 Sept.
4		2.1		2.2		2.2 **HW 1**	
Week	21 Sept.	22 Sept.	23 Sept.	24 Sept.	25 Sept.	26 Sept.	27 Sept.
5		2.3		2.4		3.1	
Week	28 Sept.	29 Sept.	30 Sept.	1 Oct.	2 Oct.	3 Oct.	4 Oct.
6		3.2		Review **HW 2**		**Exam I (Ch. 1, 2)**	
Week	5 Oct.	6 Oct.	7 Oct.	8 Oct.	9 Oct.	10 Oct.	11 Oct.
7		3.3		3.3		3.4	
Week	12 Oct.	13 Oct.	14 Oct.	15 Oct.	16 Oct.	17 Oct.	18 Oct.
8		4.1		4.2		4.3 **HW 3**	

Week/Day	Su.	Mo.	Tu.	We.	Th,	Fr.	Sa.
Week	19 Oct.	20 Oct.	21 Oct.	22 Oct.	23 Oct.	24 Oct.	25 Oct.
9		(No Class)		5.2		5.2 **HW 4**	
Week	26 Oct.	27 Oct.	28 Oct.	29 Oct.	30 Oct.	31 Oct.	1 Nov.
10		5.3		5.4		(No Class)	
Week	2 Nov.	3 Nov.	4 Nov.	5 Nov.	6 Nov.	7 Nov.	8 Nov.
11		6.1		6.2		Review **HW 5**	
Week	9 Nov.	10 Nov.	11 Nov.	12 Nov.	13 Nov.	14 Nov.	15 Nov.
12		**Exam II** **(Ch. 3, 4, 5)**	*Veteran's Day* *(No Classes)*	6.3		6.3	
Week	16 Nov.	17 Nov.	18 Nov.	19 Nov.	20 Nov.	21 Nov.	22 Nov.
13		7.1		7.2		7.3	
Week	23 Nov.	24 Nov.	25 Nov.	26 Nov.	27 Nov.	28 Nov.	29 Nov.
14		Catch-Up Day		*Thanksgiving* *Break* *(No Classes)*	*Thanksgiving* *Break* *(No Classes)*	*Thanksgiving* *Break* *(No Classes)*	
Week	30 Nov.	1 Dec.	2 Dec.	3 Dec.	4 Dec.	5 Dec.	6 Dec.
15		7.3 **HW 6**		7.3		8.1	
Week	7 Dec.	8 Dec.	9 Dec.	10 Dec.	11 Dec.	12 Dec.	13 Dec.
16		8.1		Review **HW 7**	*Last Day* *of Classes*		
Week	14 Dec.	15 Dec.	16 Dec.	17 Dec.	18 Dec.	19 Dec.	20 Dec.
17		**Final Exam** **(Ch. 6, 7, 8)**					