Math2000
Discrete Mathematics
Fall 2013 UNT

Lecture:	WH 310, Tues/Thurs 11 -- 12:20
Professor:	Dr. Anne Shepler
Office:	GAB 471B, phone: 940-565-4943
Office hours:	Tuesdays 8:30--10:30 and 2--3; Fridays 8:30--9:30; by appointment
Web:	http://www.math.unt.edu/~ashepler/Math2000F13.html
Prerequisites:	Math 1650 and Math 1710
Text:	Discrete Mathematics and Its Applications, **SIXTH Edition**, by Rosen

Grading: Course grade is based on

- Homework worth 15%,
- Two Midterm Exams worth 50% (each worth 25%) on **Oct. 10** and **Nov. 21**,
- Special projects worth 5%, and the
- Final Exam worth 30% on **Tuesday, Dec. 10, 10:30--12:30 pm.**

Homework and Exams: Come to lecture each Thursday with your homework stapled and ready to turn in at the beginning of class. No late homework will be accepted. Your lowest homework score will be dropped. (This includes work you miss due to illness, family emergency, transportation problems, oversleeping, work schedule, completing the wrong section, completing the wrong problems, etc.) Homework that is difficult to read will earn a zero score.

You must take the final exam to pass the course. You MUST take the final exam at its scheduled time and place. You must take the midterms on the scheduled dates at the scheduled times. There will be NO make-up exams. Plan your schedule accordingly. In the event of a documentable emergency or illness, contact the professor immediately (BEFORE the scheduled exam when possible). If everyone does well, everyone will receive a good grade, so study together and avoid competition. Count your points on exams and homework to be sure the totals are correct and keep a record of all your scores.

Written work: Show all your work (in clear steps) on exams and homework. No (or little) work shown usually earns no credit---even if the answer is correct. Your proofs (and solutions) will be graded on four "C's": solutions must be clear, concise, complete, and correct. Your audience should be an average student in this course, someone who has read the problem but does not know a solution. Rule of thumb: If a fact is "obvious", then it can be proved in one or two lines, so you might as well include those lines. The back of the book contains hints, not solutions, to odd-numbered problems: your solution must contain more detail than in the back of the book or any solution guide. Copying the hint from the back of the book will earn little or no credit. In general, proofs without enough detail or with confused steps will earn little or no credit.

Expectations: You are expected to come to every lecture and come on time. Plan ahead so you are not late. Although attendance will not be taken (except TAMS students), you are responsible for everything that happens in class. You are expected to read the assigned sections before each lecture. Feel free to bring beverages to class (coffee, cola, tea, water, etc.) or quiet snacks. NO ELECTRONIC DEVICES IN CLASS.

Disabilities: It is the responsibility of students with certified disabilities to provide the instructor with appropriate documentation from the Dean of Students Office before Sept. 15th.

Extra Credit: Do not expect to be able to do some extra work to help your grade either before or after the final exam. There will be no extra credit during the semester, except possibly an extra problem on an exam. You must complete the assigned work on time.

Cheating: Academic honesty is a minimal expectation for this and all UNT classes. Anyone caught cheating will receive an F for the course. Furthermore, a letter will be sent to the appropriate dean who may take further disciplinary action**.**

Special Projects:

- Meet Class Mentor before second class meeting and fill out questionnaire.
- Write a report applying the critical thinking skills learned in Math 2000 to discourse in the larger society: Identify a scientific research article, piece of political writing, or social commentary published in the last 3 years which exhibits various logical fallacies. Provide a critique of the chosen writing sample based solely on logic and mathematical standards for rigorous thought. (For example, students might examine recommendations for treating slow-growing cancers or ADHA, claims that autism is linked to vaccines or bacteria, arguments on natural gas drilling or spraying for mosquitoes near UNT campus.) More details will be provided in a handout. **Rough draft due Oct. 17 and final version due Nov. 7.**
- Meet with an assigned small group of Math 2000 students and write a polished and detailed solution guide to one homework assignment. The small group must debate choices of word and notation, as well as choice of correct proof to include based on aesthetic taste. The solution guide will be copied and distributed to the whole class. The class may then discuss choices of notation, proof techniques, and creative insights presented in the guide.
- Fill out a short questionnaire after receiving each solution guide. Students will be asked to judge if the solution guide prepared by peers provided effective and well-crafted mathematical communication.

Expected Core Learning Outcomes:

- Express critical thinking in formal proofs and mathematical solutions and use formal logic to construct compelling arguments;
- Craft thoughtful mathematical communication helpful to peers;
- Demonstrate empirical and quantitative skills by applying different systems of analysis to basic mathematical questions: induction, contradiction, quantifiers, set theory, algorithms, recursion, counting principals, permutations and combinations, binomial coefficients, discrete probability, recurrence relations, inclusion-exclusion.

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Homework Problems
(from Rosen's 6th edition)

Section	Topic	Problems
1.1	Logic	5,19,20
1.3	Quantifiers	7,24,25
1.4	Nested	2,3,9,10
1.5	(extra practice)	15,16
1.6	Intro to Proofs	6,7,14,15,17b,26,27,34,38
1.7	Proof Methods	3,12,38
2.3	One-to-one, onto	8,12,13,16,32
3.1	Algorithms	5,8,9
3.4	Integers/Division	6,10adfg, 11,12,16,20,23
3.5	Primes and GCD	4def, 10,12,16,32***
3.6	Euclidean Algorithm	23,24,25
2.4	Sequences/Sums	3,10abe, 15,16, 19, 21,22
4.1	Induction	3,4,6,7,10,18,22,31,47
4.2	Strong Induction	3,4,7,10
4.3	Recursive Def'ns	1,5,8,12,13
7.1	Recurrence Relations	1ace,3,5aceg,9abfg,37,44
7.2	Solving Recurrence Rel's	3abd, 4abc,8,12
3.2	Big-O notation	1,3,6,10,13,18,36
3.3	Complexity of Algorithms	7,8,10,22
5.1	Counting	1,2,5,7,18,28,61
5.2	Pidgeonhole	2,3,6,18,24,25
5.3	Permutations/Combo's	2,3,5,6,15,21
5.4	Binomial Coefficients	1,2,4,7,12,24
7.5	Inclusion/Exclusion	2,3,7,14
8.1	Relations	3,4,5,6
8.5	Equivalence Relations	2,4,5,6,15,16,20