MTH 231: Elements of Discrete Mathematics

Winter 2017
Lecture: MWF, 11:00-11:50am, WNGR 116
Recitation: T, BRC 136

Instructor: Sharon Green
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Office Hours: MW 1:00-1:50pm, F 4:00-4:50pm, and by appointment

Graduate Teaching Assistant: Jason McClelland
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Office/MLC Hours: W 9:00-11:00am, 12:00-1:00pm, R 10:00-12:00pm, and by appointment

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Enforced Prerequisites: MTH 112 with C- or ALEKS math placement test: 75% or math placement test: 33, or instructor permission.

Textbook: *Discrete Mathematics and Its Applications*, by Kenneth Rosen (7th Edition).

Topics: Elementary logic and set theory, functions, direct proof techniques, contradiction and contraposition, mathematical induction and recursion, elementary combinatorics, basic graph theory, minimal spanning trees.

Course Content:

- Basic logic, including quantifiers and DeMorgan's Laws for negations.
- Direct proof techniques.
- Indirect proof techniques of contradiction and contraposition.
- Elementary set theory.
- Mathematical induction and recursion.
- Elementary combinatorics, including the Sum and Product Rules, permutations, combinations.
- Basic graph theory, including connectedness.
- Algorithm for either shortest-path routing or minimal spanning trees, including a proof of the correctness.

Learning Resources: Selected portions of the text will be covered:

- Chapter 1: 1.1, 1.2, 1.3, 1.4, 1.5, 1.7, 1.8
- Chapter 2: 2.1, 2.2
- Chapter 5: 5.1, 5.3
- Chapter 6: 6.1, 6.3, 6.4
- Chapter 10: 10.1,10.2, 10.4, 10.6

Grading: The course grade will be calculated using the following rubric:

Midterms	40% (20% each)
Final	30%
Homework	15%
Recitation/Quizzes	15%

Course Grade: The course grades will be no stricter than:

A: [90, 100]% ("+" & "–"grades may be given at all grade levels)
B: [80, 90)%
C: [70, 80)%
D: [60, 70)%

Homework: All homework in this class will be written homework and assigned weekly.

Quizzes: There will be three quizzes in this course, one prior to each exam.

Recitation: In recitation you will work on activities where you can put into practice the concepts from lecture, as well as allow you to explore the material in more detail. These are group activities and you are expected to participate. Recitation grades are based on participation and correctness, and cannot be made-up.

If you know that you need to be absent for a recitation or lecture, please let me or your TA know ahead of time. ***If you do not let me know of your absence beforehand, you will receive a score of zero for that day's missed in-class assignments.*** The assignment of grades for verifiable emergency absences is at the discretion of the instructor. Midterms and final exams cannot be rescheduled or taken early. There will be no 'Incompletes' given for this course.

Exams: We will have two midterms and a final:

Midterm 1:	**7:00 – 8:20pm**	**Tuesday, February 7th**
Midterm 2:	**7:00 – 8:20pm**	**Tuesday, February 28th**
Final:	**7:30 – 9:20am**	**Wednesday, March 22nd**

Important Date: The last day to ***withdraw*** (11:55pm) from a course or ***SU*** (5:00pm) a course is ***Friday, February 24th***.

The Math Learning Center: The Math Learning Center (MLC) in Kidder 108 is a great place to drop in for help.

Winter Hours:	
Monday – Thursday	9 am – 5 pm
Friday	9 am – 4 pm

There is also the Collaborative Learning Center (CLC) in the Valley Library.

Winter Hours:

Sunday – Thursday	7 pm – 10 pm

Statement Regarding Students With Disabilities: Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at (541)737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Academic Honesty and Student Conduct: Students are expected to be familiar with the Homework and Exam policies stated in this syllabus, as well as Oregon State University's **Expectations for Student Conduct.**

Students are expected to be honest and ethical in their academic work.
Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- cheating - use or attempted use of unauthorized materials, information or study aids
- fabrication - falsification or invention of any information
- assisting - helping another commit an act of academic dishonesty
- tampering - altering or interfering with evaluation instruments and documents
- plagiarism - representing the words or ideas of another person as one's own

Expectations for students:

- Students will attend all lectures and recitations.
- Students will read through the section(s) being covered in lecture the night before.
- Students will work on homework problems as the material is covered in class.
- Students will search out and work out more problems from the text to get adequate practice.
- Students will consider a topic mastered if they can set up and solve applications without using text, notes, homework, or other help.
- Students will seek out help at the MLC, Collaborative Learning Center, TA and/or instructor office hours when they are having questions on the material and homework.

MTH 231 Measurable Student Learning Outcomes: A successful student in MTH 231 will be able to:

- Apply basic set operations.
- Be able to negate compound and quantified statements and form contrapositives.
- Be able to construct a direct proof (from definitions) of simple statements.
- Learn and apply the Principle of Mathematical Induction.
- Demonstrate an understanding of the construction of indirect proofs by contraposition and contradiction.
- Construct complete explanations for solutions to counting problems.

- Be able to use at least one algorithm for finding a shortest path or a minimal spanning tree in a connected graph.