MTH 220
Introduction to Discrete Mathematics
Spring 2020

Course information

Room: BH 406

Time: MW 4:30 - 5:45 pm

Credits: 3.0

Prerequisites: A grade of C or better in MTH 149 or MTH 182

Description: This course is an introduction to mathematical reasoning through an overview of different topics in discrete mathematics. Toics covered include: propositional and predicate logic, mathematical induction and other methods of proof, elementary number properties, sequences and recursion, set theory, functions, relations, permutations, combinations, probability, elementary graph theory, and applications.

Learning outcomes: Successful MTH 220 students will:

- become familiar with logical reasoning and common mathematical tools;
- learn to read, understand, phrase, and prove mathematical statements;
- get acquainted with several different topics in discrete mathematics.

Online resources: Visit Blackboard for up-to-date information about this course.

Instructor

Name: Federico Galetto

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Phone: 216-687-4696

Office: Rhodes Tower 1528

Office hours: Schedule an appointment at https://math.galetto.org/appt

Materials

The following textbook is required (in either physical or digital format).

Required textbook:

- Kenneth H. Rosen, *Discrete Mathematics and Its Applications*, McGraw-Hill, 9780073383095

Notes and other materials will be distributed on Blackboard.

Grading

Grade calculation: All grades will be posted online. Your percentage grade will be computed according to the following breakdown and converted to a letter grade as indicated below.

10%	Homework
15%	Quizzes
25%	Tests (x3)
100%	Total

A	93%-100%
A-	90%-92%
B+	87%-89%
B	83%-86%
B-	80%-82%

C+	77%-79%
C	70%-76%
D	60%-69%
F	0%-59%

Homework:
- Homework is completed online at http://webworks2.csuohio.edu/webwork2/CSU_MTH220_Spring20/. Your username and (initial) password is your CSU ID.
- You should expect one homework assignment each week. Due dates will be announced in class and online.
- You are expected to work independently on all assignments.

Quizzes:
- A quiz will be held in class every Wednesday, unless otherwise noted or a test is scheduled.
- Quizzes will contain a short assessment of recently covered topics, including but not limited to problems similar to the online homework and practice problems assigned in class.
- The two lowest quiz grades will be dropped.

Tests: There will be 3 tests held in class on the following (tentative) dates:

- Wednesday, February 12, 2020
- Wednesday, April 1, 2020
- Wednesday, April 29, 2020

Each test will cover roughly one third of the material (topics will be confirmed in class). You are required to bring identification.

Final exam: An optional final exam will be held in class on Monday, May 4, 2020, 4:00 - 6:00 pm. You are required to bring identification. During this final exam, you may choose to be tested again on the material of one or two of the in-class tests. You must choose the test with your lowest score or the two with your lowest two scores. The final score(s) will only replace the corresponding test(s) if it increases your total score.

Participation: Active participation is encouraged and can contribute positively to your grade. Such participation includes answering questions in class, asking good questions in class, etc.

Grade appeal: You are responsible for checking corrections on quizzes and tests, and for ensuring grades are reported correctly on Blackboard. Any appeal request must be submitted within one week after the grade is posted.

Policies

Attendance: You are expected to attend all classes. If you are unable to attend a class, it is your responsibility to notify your instructor in advance and to inquire about any topics covered and announcements made during that class.

Electronic devices: The use of electronic devices such as (but not limited to) phones, smartwatches, computers, tablets, and headphones is prohibited during class, unless otherwise indicated. If you wish to use an electronic device for note taking, you need to receive explicit consent from your instructor and you may occasionally be asked to submit a sample of your notes.

Excused absences: You may only be excused from class and class related activities in case of university sanctioned activities (such as conferences, competitions, etc.) or in case of medical conditions. With the exception of unforeseen medical emergencies, you must notify your instructor of your absence and present sufficient documentation in advance. Sufficient documentation includes an invitation to attend an event or a doctor's note indicating you cannot take the test on the scheduled date.

Extra credit and makeups: There is no extra credit in this class. There are no makeups in this class other than for excused absences.

Academic integrity: Cheating and/or plagiarism will not be tolerated. Cheating includes copying or receiving help from another student on quizzes, tests or exams, as well as allowing another student to copy from your work. Receiving help from someone else by using an electronic device such as a mobile phone or a smartwatch constitutes cheating. Copying another student's homework, or allowing someone else to do your homework for you, is also considered cheating. If cheating occurs in a quiz or test, the student will receive a grade of 0 for that component of the course. If a student cheats a second time during the course, the student will receive an F for the course. If cheating occurs on the final exam, the student will receive a grade of F in the course. Any cheating activity may be reported for further action. Information regarding the official CSU Policy on Academic Misconduct can be found at https://www.csuohio.edu/sites/default/files/3344-21-02_0.pdf.

Accommodations: Educational access is the provision of classroom accommodations, auxiliary aids and services to ensure equal educational opportunities for all students regardless of their disability. Students who feel they may need an accommodation based on the impact of a disability should contact the Office of Disability Services at 216-687-2015. The Office is located in BH 147. Accommodations need to be requested in advance and will not be granted retroactively.

Withdrawals: The last day to withdraw is Friday, March 27, 2020. Withdrawing from the course may put a student in violation of the federally mandated standards for academic progress (SAP) that a stuent must maintain to be eligible for financial aid. Please visit https://www.csuohio.edu/financial-aid/standards-academic-progress-sap for more information.

Course modifications: The instructor retains the right to modify the contents of the course, including grading criteria and course policies. Reasonable notice will be given for all time sensitive matters. Course changes will be communicated in class and on Blackboard.

Math 220-Section 50: Discrete Mathematics
Daily Schedule, Spring 2020
updated 3/23/2020

Specific daily topics may be rearranged without notice.
All sections below refer to the textbook *Discrete Mathematics and Its Applications, 7th edition* by Kenneth H. Rosen.

Monday	Wednesday
1/13 **Week 1** 1.1 Propositional Logic 1.2 Applications of Propositional Logic	1/15 1.2 cont. 1.3 Propositional Equivalences
1/20 **Week 2** *Martin Luther King Jr. Day*	1/22 1.4 Predicates and Quantifiers
1/27 **Week 3** 1.4 cont. 1.5 Nested Quantifiers	1/29 1.5 cont. 1.6 Rules of Inference
2/3 **Week 4** 1.6 cont. 1.7 Introduction to Proofs 1.8 Proof Methods and Strategy	2/5 1.8 cont.
2/10 **Week 5** 2.1 Sets 2.2 Set Operations	2/12 **Test #1 (1.1-1.8)**
2/17 **Week 6** *President's Day*	2/19 2.2 cont. 2.3 Functions
2/24 **Week 7** 2.3 cont. 2.5 Cardinality of Sets 4.1 Divisibility and Modular Arithmetic	2/26 4.1 cont. 4.2 Integer Representations and Algorithms
3/2 **Week 8** 4.2 cont. 4.3 Primes and Greatest Common Divisors	3/4 2.4 Sequences and Summations 5.1 Mathematical Induction

Monday	Wednesday
3/9 **Week 9** *Spring Break* *Midterm grades due on Sun*	3/11 *Spring Break*
3/16 **Week 9** *Extended Spring Break*	3/18 *Extended Spring Break*
3/23 **Week 9** 2.4 Sequences and Summations 5.1 Mathematical Induction	3/25 5.1 cont. 5.2 Strong Induction and Well-Ordering
3/30 **Week 10** 5.3 Recursive Definitions (skip Structural Induction) 6.1 The Basics of Counting	4/1 6.2 The Pigeonhole Principle 6.3 Permutations and Combinations
4/6 **Week 11** 6.3 cont. 6.4 Binomial Coefficients and Identities	4/8 **Test #2 (2.1-2.5, 4.1-4.3, 5.1-5.2)**
4/13 **Week 12** 9.1 Relations and Their Properties 9.5 Equivalence Relations	4/15 9.5 cont.
4/20 **Week 13** 10.1 Graphs and Graph Models	4/22 10.2 Graph Terminology and Special Types of Graphs
4/27 **Week 14** 11.1 Introduction to Trees	4/29 **Test #3 (5.3, 6.1-6.4, 7.1, 9.1-9.5, 10.1)**

Final Exam as per Academic Calendar schedule (or as adjusted by CSU:
Monday May 4, 2020, 4:00–6:00 PM