

# Math 230- Intro to Discrete Math

**Course:** Math 230 Spring 2016, Section 02

**Instructor:** John Erickson

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**Office hours:** W, F 9:00-10:00

M, W 3:15--4:15

F 3:15--4:15 (this is by appointment only)

**Times and Locations:** Lecture meets 11:25 am - 12:40 pm MW Siegel Hall 203

**Course Description from Bulletin:** Sets, statements and elementary symbolic logic; relations and digraphs; functions and sequences; mathematical induction; basic counting techniques and recurrence. Credit will not be granted for both CS 330 and MATH 230. (3-0-3)

**Enrollment:** Required for AM majors; MATH 230 or CS 330 is required for CS majors. Elective for other majors.

**Textbook:** Kenneth H. Rosen, Discrete Mathematics and Applications, 7th Edition, McGraw-Hill (2011), ISBN 0-07-338309-0.

**Prerequisites:** You should know college algebra well, be willing to think both logically and creatively, and you should be interested in and respect the power of mathematics. One would think that this last part doesn't need to be said, but, unfortunately, it does!

## **Objectives:**

1. Students will express real-life concepts and mathematics using formal logic and vice-versa; they will manipulate using formal methods of propositional and predicate logic; they will know set operation analogues.
2. Students will know basic methods of proofs and use certain basic strategies to produce proofs; they will have a notion of mathematics as an evolving subject.
3. Students will be comfortable with various forms of induction and recursion.
4. Students will understand algorithms and time complexity from a mathematical viewpoint.
5. Students will know a certain amount about: functions, number theory, counting, discrete probability, and equivalence relations.

**Lecture schedule:** Two 75 minute lectures per week. The calendar is in a separate document.

## **Course Outline:**

1. Foundations: Expressing real-life concepts and mathematics in terms of formal logic and vice-versa. Manipulate using formal methods of propositional and predicate logic. Also, set operation analogues.
2. Functions, algorithms, and (mostly worst-case) complexity
3. Number Theory with applications
4. Mathematical Reasoning, Induction and Recursion

5. Counting: Permutations & Combinations, Binomial Coefficients, and the Pigeonhole Principle
6. Discrete Probability
7. Relations including Equivalence Relations

**Assessment:**

Homework 20%

Quizzes 10%

Exams 40%

Final Exam 30%

**Americans with Disabilities Act (ADA) Policy Statement**

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone: 312.567.5744 or [disabilities@iit.edu](mailto:disabilities@iit.edu)

**This syllabus is subject to reasonable modification as the faculty member deems necessary.**