

Why am I taking this course?
Foundation for other courses
Mathematical Maturity
What is Discrete Math?
What kinds of problems will I be able to solve?

Lecture 0: Introduction

Matthew Fricke

June 3, 2013

Why am I taking this course?

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Mathematical Maturity

What is Discrete Math?

What kinds of problems will I be able to solve?

This Lecture

- 1 Why am I taking this course?
- 2 Foundation for other courses
- 3 Mathematical Maturity
- 4 What is Discrete Math?
- 5 What kinds of problems will I be able to solve?

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Mathematical Maturity

What is Discrete Math?

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- Foundation for other courses
- Solve important Computer Science problems

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- Foundation for other courses
- Solve important Computer Science problems
- Develop "Mathematical Maturity"

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What is Discrete Math?

What kinds of problems will I be able to solve?

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- Algorithms and Datastructures I/II (CS361/2)

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- Algorithms and Datastructures I/II (CS361/2)
 - Proofs, Graphs, Trees, Recurrence, Sums, Sequences

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- Functional Languages (CS327)

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- Imperative Languages (CS351)

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What is Discrete Math?

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- Imperative Languages (CS351)
 - Graphs, Trees, Recurrence, Binary and Boolean Logic, etc

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- Imperative Languages (CS351)
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- Computer Security
 - Number Theory, Proofs

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- Complex Systems

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- ... and every other math and computer science course you will ever take!

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- ... and every other math and computer science course you will ever take!
 - Logic, Sets, Functions, Relations, Proofs, ...

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What is Discrete Math?

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Why am I taking this course?

- Introduction to many areas of math

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Why am I taking this course?

- Introduction to many areas of math
- Logic

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- Introduction to many areas of math
- Logic
- Sets

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What is Discrete Math?

What kinds of problems will I be able to solve?

Why am I taking this course?

- Introduction to many areas of math
- Logic
- Sets
- Combinatorics

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- Logic
- Sets
- Combinatorics
- Number Theory

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- Introduction to many areas of math
- Logic
- Sets
- Combinatorics
- Number Theory
- Discrete Probability

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- Introduction to many areas of math
- Logic
- Sets
- Combinatorics
- Number Theory
- Discrete Probability
- Theory of Computation

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What is Discrete Math?

What kinds of problems will I be able to solve?

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- Not Real numbers - Mathematics of the Finite (mostly)

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- Not Real numbers - Mathematics of the Finite (mostly)
- Discrete mathematical objects (binary, integers, sets, graphs)

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- Discrete mathematical objects (binary, integers, sets, graphs)
- Mathematics of Computers

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What is Discrete Math?

What kinds of problems will I be able to solve?

Why am I taking this course?

- How many valid Internet Addresses are there?

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What is Discrete Math?

What kinds of problems will I be able to solve?

Why am I taking this course?

- How many valid Internet Addresses are there?
- How can I encrypt a message between two computers?

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What is Discrete Math?

What kinds of problems will I be able to solve?

Why am I taking this course?

- How many valid Internet Addresses are there?
- How can I encrypt a message between two computers?
- How can I build a circuit that adds two numbers?

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- How many valid Internet Addresses are there?
- How can I encrypt a message between two computers?
- How can I build a circuit that adds two numbers?
- How can I find the shortest path between two computers, or visit all cities in the shortest time?

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- How many valid Internet Addresses are there?
- How can I encrypt a message between two computers?
- How can I build a circuit that adds two numbers?
- How can I find the shortest path between two computers, or visit all cities in the shortest time?
- Calculate the probability of winning a lottery.