Discrete Mathematics

Course Overview

Mathematics - the study of any and all absolutely certain truths about any and all perfectly well-defined concepts.

Discrete - Composed of distinct, separable parts. (Opposite of continuous.)

discrete:continuous :: digital:analog

Structures - objects built up from simpler objects according to a definite pattern.

Discrete Mathematics - The study of discrete, mathematical objects and structures.

Discrete Mathematics - The study of

- Discrete objects
- Reasoning about discrete objects
- Counting discrete objects

Example of Discrete Objects:

	Ordered?	Duplicate?
Set	N	N
Sequence	Y	Y
Bag(Multiset)	N	Y

- A Set is unordered collections of items, which do not contain duplicates.
- A sequence is an ordered collection of items, that may contain duplicates.
- A bag is an unordered collection of items that may contain duplicates

Why Study Discrete Mathematics?

- **The basis of all of digital information processing**: Discrete manipulations of discrete structures represented in memory.

Why Study Discrete Mathematics?

- **It's the basic language and conceptual foundation of all of computing.**

Uses of Discrete Mathematics

- Advanced algorithms & data structures
- Programming language compilers & interpreters.
- Computer networks
- Operating systems
- Computer architecture
- Database management systems
- Cryptography
- Error correction codes
- Graphics & animation algorithms, game engines
- Just about everything!

Grading

- Attendance 20%
- Assignment 20%
- Test 20%
- Midterm Examination 20%
- Final Examination 20%