

CM0246 Discrete Structures

Introduction

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Administrative Information

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Course web page

<http://www1.eafit.edu.co/asr/courses/cb0246-discrete-structures/>

Exams, textbook, etc.

See course web page.

Discrete Structures

Definition of 'discrete'

Adjective. Individually separate and distinct. Late Middle English. From Latin *discretus* 'separate'.[†]

Adjetivo. Separado, distinto.[‡]

[†]From <http://www.oxforddictionaries.com> .

[‡]From <http://www.rae.es/drae> .

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Description

Abstract mathematical structures used to represent discrete objects (separated from each other) and relationships between these objects.

Example

Sets, relations, graphs, trees, finite-state machines, among others.

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Discrete Structures

Applications

- Algorithm design
- Automata theory
- Bio-informatics
- Complexity theory
- Computability
- Cryptography
- Formal languages
- Genetic algorithms
- Mathematical modelling
- Network flows
- Simulations

Course Outline

- Functions, infinite sets, and mathematical and structural induction

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- Relations (representation, equivalence relations)
- Ordering relations (partial orders, lexicographical orders, Hasse diagrams, notable elements, lattices, Boolean algebras)
- Graphs (classification, representation, Euler and Hamilton paths, shortest-path problems, planar graphs, graph coloring)