



METADATA

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Abstract

This book will include material that goes beyond a typical "Discrete Mathematics" course as mostly taken by students in Computer Science departments. It will start with the basic concepts of Set Theory and Logic, to a level which will allow their easier use later in the course)and without particular emphasis on difficult theorems (but the diagonal argument that serves both the concept of countability and computability will be discussed). Some basic concepts of Number Theory will follow (divisibility, analysis into primes, Euclidean algorithm, calculations with remainders). Concepts and techniques of enumeration in Combinatorics occupy the first important section of the course and are followed by the next section which are the central

concepts of Graph theory (degrees, connectivity, colorings, bipartite graphs, matchings in bipartite graphs and duality, trees, basic algorithms).After the introduction to combinatorial enumeration, the concept of discrete probability, random variables and their mean value are introduced which enable us to give many applications to non-probabilistic (and algorithmic) problems. Additional material includes elements of the theory of formal languages: regular languages, deterministic and non-deterministic automata, algorithms for automata. This material must be considered as outside the basic course of Discrete Mathematics and as additional material to which the teacher can move if circumstances allow it or needs require it.

