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Abstract

Computer science (CS) deals with computers and computational systems. People who are involved in it create algorithms and artificial neural networks that make software and its interaction with hardware, and work to the development of appropriate hardware. A cornerstone in supporting research on CS is the field of discrete mathematics that provides mathematical tools to extend the abilities of the machines. In particular, the areas of mathematical logic, combinatorics, graph theory, linear algebra, switched circuits, and algebraic structures (such as monoids and machines) contribute to the development of computer science. Dealing with these areas of applied mathematics electrical and computer engineers are able to understand the operation of computer systems, and as well the management of networked computers. This electronic book attempts to present some basic concepts of Discrete Mathematics, i.e. mathematics that refers to discrete sets. As the

Discrete Mathematics course is taught as a compulsory course in the first semesters of the polytechnic school's curricula, this book describe and explain the subject's basics, using interactive examples that contribute to the understanding of the topics. The content is organized in the order of the university lectures on courses presented during the academic year 1990-91, in the Department of Electrical and Computer Engineering of the Polytechnic School of Democritus University of Thrace. The goal of this e-book is to improve the student's mathematical thinking. As an educational tool, it aspires to serve the purpose of education that is the development of the brain's capacity to learn, and not of course the sterile reproduction of information. On the other hand, the ability to "think" allows the development of the engineer's creativity, while the sterile reproduction of information allows only to copy and reproduce trivial and known ideas.