Contents

When we have not what we like, we must like what we have.
COMTE DE BUSSY-RABUTIN

1	Basi	c Graph Theory
	1.1	Graphs, Subgraphs and Factors
	1.2	Paths, Cycles, Connectedness, Trees
	1.3	Euler Tours
	1.4	Hamiltonian Cycles
	1.5	Planar Graphs
	1.6	Digraphs
	1.7	An Application: Tournaments and Leagues 29
2	Algo	orithms and Complexity
	2.1	Algorithms
	2.2	Representing Graphs
	2.3	The Algorithm of Hierholzer
	2.4	How to Write Down Algorithms
	2.5	The Complexity of Algorithms
	2.6	Directed Acyclic Graphs
	2.7	An Introduction to NP-completeness
	2.8	Five NP-complete Problems
3	Shor	rtest Paths
	3.1	Shortest Paths
	3.2	Finite Metric Spaces
	3.3	Breadth First Search and Bipartite Graphs 69
	3.4	Shortest Path Trees
	3.5	Bellman's Equations and Acyclic Networks
	3.6	An Application: Scheduling Projects
	3.7	The Algorithm of Dijkstra
	3.8	An Application: Train Schedules
	3.9	The Algorithm of Floyd and Warshall 91
	3.10	Cycles of Negative Length
	3.11	Path Algebras