1	Mathematical Preliminaries	
	.1 Review of Linear Algebra	
	1.1.2 Vector Spaces	
	1.1.3 Important Topics	. 7
	.2 Review of Calculus in Euclidean Space	
	1.2.1 Derivatives and Integrals	
	1.2.2 Overview of Differential Equations	. (
2	Review of Mechanics	
	Historical Development of Classical Dynamics	
	Newtonian Mechanics	
	2.2.1 Laws of Motion	
	4.4 Hamiltonian (Brief Overview)	
3	Historical Development and Motivation for Relativity	
9	1.1 Galilean relativity	9
	2.2 Maxwell's equations	
	Michelson-Morley experiment	
	4.4 Lorentz and Einstein	
	Minkowski spacetime	
	.o Need for a new theory. Motivation for special relativity	. 9
4	Postulates and Foundations	
	.1 Postulates of Relativity	
	.2 Derivations of Lorentz Transformation	. 10
5	Key Concepts	
	.1 Length Contraction	
	2. Time Dilation	
	.3 Velocities in SR	
	5.4.1 Deriving Addition Formulae	
	5.4.2 Does Postulate of Speed of Light Hold?	
	.5 Relativistic Doppler Effect	. 11
6	Four-Vectors and Concepts of Spacetime	
U	1.1 Introduction to Four-Vectors	. 12
	6.1.1 Euclidean vectors vs. four-vectors	
	6.1.2 Transformation properties	
	6.2 Concept of Spacetime	
	6.3.1 Three Types of Intervals	
	4.4 Worldlines and Light Cones	
7	Advanced Topics	19
	1 SR Lagrangian	
	3 Momentum in Special Relativity	
	7.4 $E=mc^2$ Mass-Energy Equivalence	. 13
	Conservation of Energy and Momentum	
	7.6 4-Vectors and Examples	
	7.7 Calculus in Special Relativity	. 13