1 Maxwell equations and Galileo invariance.

2 The wave equation and the origin of the Lorentz group.

3 The Minkowski metric, the inverse Cauchy-Schwarz inequality, examples of Lorentz transformations.

4 Lorentz contraction, time dilation, the twin paradox.

5 Addition of velocities, Fizeau's experiment

6 Proper time, uniform acceleration, photons in special relativity.

7 Doppler effect, aberration of light.

8 Decay of particles, Compton effect.

9 Inelastic and elastic collisions.

10 Lagrangean field theory: Euler-Lagrange equations, canonical and symmetric energy-momentum tensors, examples.

11 Basic principles of general relativity and their implications.

12 Introduction to tensor calculus: scalars, vectors, covectors, contractions.

13 The Levi-Civita covariant derivative, local inertial coordinates.

14 The curvature tensor and its properties.

15 The linearized Einstein equations.

16 Tidal forces, the geodesic deviation equation.

17 The Schwarzschild metric