Code	Subject Title	Cr. Hrs	Semester
MATH-426	**Special Theory of Relativity**	**3**	**VIII**
Year	Discipline		
4	**Mathematics**		

Objectives:

Introduction

- Fundamental concepts
- Derivation of Special Relativity
- Einstein's formulation of special relativity
- The Lorentz transformation
- Length contraction, time dilation and simultaneity
- The velocity addition formulae
- Three dimensional Lorentz transformations

The Four-Vector Formulation of Special Relativity

- The four-vector formalism
- The Lorentz transformations in 4-vectors
- The Lorentz and Poincare groups
- The null cone structure
- Proper time

Applications of Special Relativity

- Relativistic kinematics
- The Doppler shift in relativity
- The Compton effect
- Particle scattering
- Binding energy, particle produc tion and particle decay

Electromagnetism in Special Relativity

- Review of electromagnetism
- The electric and magnetic field intensities
- The electric current
- Maxwell's equations and electromagnetic waves
- The four-vector formulation of Maxwell's equations

Recommended Books:

- M. Saleem and M. Rafique, Special Relativity (Ellis Horwood, 1992)
- W. G. V. Rosser, Introductory Special Relativity (Taylor & Francis, 1991)
- W. Ringler, Introduction to Special Relativity (Oxford, 1991)
- A. Qadir, An Introduction to Special Theory of Relativity (World Scientific 1989)
- G. Barton, Introduction to the Relativity Principle (Wiley, 1999)
- W. Rindler, Introduction to Special Relativity (Clarendon Press, Oxford, 1991)