

TCIS Hyderabad

Course : Classical Electrodynamics - II
Credits : 4
Coordinates : Tuesday & Thursday 11.00 - 12.30 hrs.
Contact Hours : 48 hrs.
Instructor/s : Surajit Sengupta

Syllabus

- Special relativity and relativistic kinematics
- Covariant (Lagrangian) formulation of electrodynamics
- Motion of charges and electromagnetic fields: Leinard Weichert potentials
- Charges in electromagnetic fields: radiation from an accelerated Charge, Bremsstrahlung, Cherenkov, Synchrotron and Transition.
- Radiation reaction: energy loss mechanisms
- Electromagnetic fields propagating through matter: scattering, diffraction
- **Special topics:** Radiation from uniformly accelerated charges, Lasers and nonlinear optics, novel optical phenomena, Astrophysical phenomena like cosmic ray acceleration

Text / References Books

- W.K.H.Panofsky and M.Phillips : Classical Electricity and Magnetism (Addison Wesley)
- J.D. Jackson, Classical Electrodynamics (John Wiley)
- Landau & Lifshitz : Classical Theory of Fields (Elsevier Science)
- David J. Griffiths, Introduction to Electrodynamics (Prentice Hall)