

15P1WPH214 Advance Dilute Magnetic Semiconductors

Subject Code	15P1WPH214	
Credits	3	Contact Hours: 03
Module No.	Subtitle of the Module	Topics
1.	Introduction	A brief history of magnetism, magnetism and hysteresis, magnet application, Plasmon, Optical phonons and Polarization waves.
2.	Magnetostatics	The magnetic dipole moment, magnetic fields, Maxwell's equations, magnetic field calculations, magnetostatics energy and forces, orbital and spin moments, theory of electronic magnetism, magnetism of electrons in solids.
3.	Magnetism and exchange energy	The hydrogenic atom and angular momentum, the many electron atoms, paramagnetism, Ions in solids, crystal field interaction and spin orbit coupling, mean field theory, exchange interactions, band magnetism, Collective excitation,
4.	Magnetic order	Molecular field theory of antiferromagnetism, ferrimagnets, Frustration, amorphous magnets, spin glasses, magnetic models, micro magnetic energy, Domain theory , Reversal, pinning and nucleation, magnons, Fermion fields and the Hartree-Fock Approximation, Polarons and Electron-Phonon Interaction.
5.	Magnetic Resonance	Electron paramagnetic/spin resonance, ferromagnetic resonance, nuclear magnetic resonance, ENDOR, ODMR, positron annihilation, surface measurements by XPS and magnetic circular dichromatic (MCD).

Recommended Reading (Books/Journals/Reports/Websites etc.: Author(s), Title, Edition, Publisher, Year of Publication etc. in IEEE format)	
1.	J.M.D Coey: Magnetism and magnetic materials
2.	K.H.J Buschow and F.R.DE Boer: Physics of magnetism and magnetic materials.
3.	Charles Kittels: Quantum theory of solids
4.	Ashcroft and Mermin: Solid state Physics
5.	Vladimir Anisimov and Yuri Izyumov: Electronic structure of strongly correlated materials.