Semester	AUG 2022
Open to semester	7,13,21
Course code	**PH4113/PH6363**
Course title	**Condensed Matter Physics ? II**
Credits	3 /3
Course Coordinator & participating faculty (if any)	Mukul Kabir
Nature of Course	Lectures
Pre-requisites	Should have taken Quantum Mechanics - I and Condensed Matter Physics - I
Objectives (goals, type of students for whom useful, outcome etc)	This course will cover various interacting quantum many-body phenomena, which will be a good foundation for those who are interested in theoretical, experimental, and computational research in condensed matter.
Course contents (details of topics /sections with no. of lectures for each)	o Interacting electrons (Many-body problem, Hartree-Fock approximation, Density Functional Theory) o Linear response theory o Physics of disorder (Kubo formula for conductivity, Scaling theory of localization, Quantum hall effect) o Quantum Magnetism (Local moment magnetism, exchange interaction, Hubbard model, Anderson model, Kondo problem); o Fermi liquid theory o Superconductivity (Landau diamagnetism, London equation and effect of disorder, Ginzburg-Landau theory, vortices, Type II superconductor)
Evaluation /assessment	End-Sem Examination-50% Mid-Sem Examination-50% Others-%
Suggested readings (with full list of authors, publisher, year, edn etc.)	1. Advanced Solid State Physics – Phillip Phillips 2. Solid State Physics, by N W Ashcroft and N D Mermin, Harcourt College Publishers. (College Ed.) 3. Theory of Quantum liquid, Pines and Nozieres, Westview Press 4. Theory of Superconductivity. J. Robert Schrieffer, Westview Press