

Subject Code: 1SC2030403	Subject Title: ORGANIC CHEMISTRY-VII
COURSE TYPE: CORE COURSE	

Course Objective: To impart knowledge and training in chemistry at advanced level, make aware with recent analytical technique, use of reagents and reactions in laboratory, synthesis and study of materials, the exploration of their properties and development of ways to use the mineral life.

Teaching scheme (hours) per week		Credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
4	-	4	-	60	40	-	-	100

UNIT	DISCRIPTION IN DETAIL	WEIGHTAGE
I	<u>Nano chemistry</u> Basic nano material synthesis, bottom up vs. topdown method, synthesis and properties of metal nano particles, metal oxides semiconductors, carbon nanotubes and graphenes, functionalization of metal nano particles with organic ligands, polymer and biomolecules for selective applications.	25%
II	<u>Liquid crystal</u> Mesomorphic behavior, thermotropic liquid crystals, positional order, bond orientational order, nematic and smectic mesophases, smectic-nematic transition and clearing temperature-homeotropic, planar and schlieren textures, twisted nematics, chiral nematics, molecular arrangement in smectic A and smectic C phases, optical properties of liquid crystals, dielectric susceptibility and dielectric constant, Lyotropic phases and their description of ordering in liquid crystals.	25%
III	<u>Polymeric materials</u> Molecular shape, structure and configuration, crystallinity, stress-strain behavior, thermal behavior, polymer types and their applications, conducting and ferro electric polymers.	25%
IV	<u>Organic solids, Fullerenes, Molecular devices</u> Conducting organics, organic superconductors, magnetism in organic materials. Fullerenes – doped, fullerenes as superconductors. Molecular rectifiers and transistors, artificial photosynthetic devices, optical storage memory and switches – sensors. Non linear optical materials : Non linear optical effects, second – third order, molecular hyperpolarisability and second order electric susceptibility- materials for second and third harmonic generation.	25%

Learning Outcomes

Students can understand the atomic and molecular basis of organic chemistry. They can know the impact of organic chemistry on the fields of medicine, pharmacy and its impact on the global economy. They can understand the fundamental principles of molecular structure and shape as they relate to organic molecules and their properties. They can identify organic molecules by functional group: alkane, alkene, alkyne, haloalkane, alcohol, thiol, ether, sulfide, amine, aldehyde, ketone, carboxylic acid and carboxylic acid derivatives.

Books

1. Solid state Physics, N W Ashcroft and N D Mermin, Suanders college.
2. Material science and engineering, an introduction, W D Callister, Wiley.
3. Principles of the solid state, H V Keer, Wiley eastern.
4. Material science, J C Anderson, K D Leaver, J M Alexander and R D Rawlings, ELBS.
5. Thermotropic liquid crystals. Ed, G W Gray, John Wiley.
6. Handbook of liquid crystals, Kelkar and Hatz, Chemie verlag.
7. Physical properties of Materials, Marry Anne White, CRC press.