**APPROVED SYLLABUS for UNDERGRADUATE (B.Tech.) COURSE**

**CH 1101/CH1201 (Chemistry Theory)**

**CH1171/ CH1271 (Chemistry Practical)**

**SYLLABUS FOR THE CREDIT BASED CURRICULUM**

**From 2019 Onwards**

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# Related image

# Department of Chemistry

# Indian Institute of Engineering Science and Technology, Shibpur

# Howrah – 711 103

**Course structure of Four-year B. Tech Program**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **First Semester** | | | | | **Second Semester** | | | |
| Subject | | Code | | Credit | Subject | Code | | Credit |
| Chemistry | CH1101/ CH1201 | | 3 | | Chemistry | | CH1101/ CH1201 | 3 |
| Chemistry Lab | CH1171/ CH1271 | | 2 | | Chemistry Lab | | CH1171/ CH1271 | 2 |

**Course content for UNDERGRADUATE (B. Tech)**

**CH 1101/CH1201 (Chemistry Theory) (for all Engg. Branches)**

**03 Credit**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Module Name and Topics** | **No. of Clasees** |
| 1. | **Structure and Reactivity of Organic Molecules**  Electronic influencing effects, aromicity, elementary idea of stereochemistry, mechanisms of some selected organic reactions. | 04 |
| 2. | **Polymeric Materials**  Elementary ideas of Polymer chemistry, thermosetting and thermoplastics, Nylon 6, Nylon 66, polyester, SBR, biopolymers, proteins | 02 |
| 3. | **Spectroscopic Techniques in Chemistry**  Experimental methods of structure determination using UV-VIS, IR and 1H-NMRc | 06 |
| 4. | **Ligand Field Theory**  Crystal field theory, spectroscopic and magnetic properties of transition metal complexes | 06 |
| 5. | **Bioinorganic Chemistry**  Metal ions in biology, toxicity of metals ions, metal ions in medicine, radionuclide in therapy and diagnosis | 06 |
| 6. | **Electrochemistry**  Solid solution interfaces and polarization, electrochemical cells and energy conversion. | 06 |
| 8. | **Rate Theory and Chemical Dynamics**  Review of basic rate laws, elementary reactions and complex reactions (including chain. Parallel, consecutive and unimolecular reactions), temperature dependence of rate constants, fundamental aspects of activated complex model and transition state theory, thermodynamic formulation, rate constants and activation barriers, enzyme catalyzed reactions. | 06 |
|  | **Total** | **36** |

**Course content for UNDERGRADUATE (B. Tech)**

**CH 1171/CH1271 (Chemistry Practical) (for all Engg. Branches)**

**02 Credit**

|  |  |
| --- | --- |
| **Sl No.** | **Experiment Name** |
| 1 | Preparation of primary standard solutions andDetermination of Fe3+ in cement samples |
| 2 | Estimation of Cu2+ in brass |
| 3 | Estimation of hardness in water by EDTA method |
| 4 | Determination of partition co-efficient of benzoic acid in toluene and water |
| 5 | Detection of non-nitrogeneous functional groups in known and unknown organic compounds |
| 6 | Detection of nitrogeneous functional groups in known and unknown organic compounds |