

# Academic Calendar & Plan

## Academic Year 2022-23

(Distribution of syllabus into Modules and Units of B.Sc. Honours Course CBCS)

Department of Chemistry

Sarat Centenary College, Dhaniakhali, Hooghly

### Semester-1

**Orientation Programme** – 1<sup>st</sup> week of July: General outline of Chemistry syllabus and its Scope & Importance

**CC-I: Organic Chemistry-I/ CC-II: Physical Chemistry-I**

**Credits:** Theory-4, Practical-2,

**Marks:** Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

#### 1<sup>st</sup> Module (July-September)

| Name of the teacher and Course                      | Theory  | Practical  |
|---|---|--|
| Dr. Sanjay Mondal<br>CC-1: Organic Chemistry-I      | <b>Fundamentals in Organic chemistry</b> <ul style="list-style-type: none"><li>Bonding and Physical Properties: Valence Bond Theory Electronic displacements, MO theory, Physical properties</li><li>General Treatment of Reaction Mechanism I: Mechanistic classification, Reactive intermediates</li></ul>  | ▪ Separation of Organic compound   |
| Mrs. Pallabi Acharyya<br>CC-2: Physical Chemistry-I | <b>Kinetic Theory and Gaseous state</b> <ol style="list-style-type: none"><li>Kinetic Theory of gases</li><li>Maxwell's distribution of speed and energy</li><li>Real gas and virial equation</li></ol> <b>Chemical Thermodynamics</b> <ol style="list-style-type: none"><li>Zeroth and 1st law of Thermodynamics</li><li>Thermochemistry</li></ol> | <ol style="list-style-type: none"><li>Determination of pH of unknown solution (buffer), by color matching method;</li><li>Determination of the reaction rate constant of hydrolysis of ethylacetate in the presence of an equal quantity of sodium hydroxide;</li><li>Study of kinetics of acid-catalyzed hydrolysis of methyl acetate</li></ol> |

#### 2<sup>nd</sup> Module (October to December)

| Name of the teacher and Course                      | Theory  | Practical   |
|---|---|---|
| Dr. Sanjay Mondal<br>CC-1: Organic Chemistry-I      | • Stereochemistry-I   | ▪ Determination of boiling point  |
| Mrs. Pallabi Acharyya<br>CC-2: Physical Chemistry-I | <b>Chemical Thermodynamics</b> <ol style="list-style-type: none"><li>Second Law of Thermodynamics</li></ol> | <ol style="list-style-type: none"><li>Study of kinetics of decomposition of H<sub>2</sub>O<sub>2</sub> by KI;</li></ol> |

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|  | 2. Thermodynamic relations<br><b>Chemical kinetics</b><br>1. Rate law, order and molecularity<br>2. Role of Temperature and theories of reaction rate<br>3. Homogeneous catalysis<br>4. Autocatalysis; periodic reaction sReal gas and virial equation | 2. Determination of solubility product of PbI <sub>2</sub> by titremetric method |
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**Internal Assessment:** 1<sup>st</sup> Week of December

Theory and Practical Examination: as per notification of B.U. (Tentatively on December)

### Semester-II

CC 3: Inorganic Chemistry-I/ CC- 4: Organic Chemistry-II

**Credits:** Theory-4, Practical-2,

**Marks:** Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

#### 1<sup>st</sup> Module (January-March)

| Name of the teacher and Course                    | Theory  | Practical   |
|---|---|---|
| Dr. Suparna Sadhu<br>CC-3: Inorganic Chemistry-II | <ul style="list-style-type: none"> <li>• Extra nuclear Structure of atom</li> <li>• Chemical periodicity</li> </ul> | <ul style="list-style-type: none"> <li>▪ . Oxidation-Reduction Titrimetric</li> <li>1. Estimation of Fe(II) using standardized KMnO<sub>4</sub> solution</li> <li>2. Estimation of oxalic acid and sodium oxalate in a given mixture</li> <li>3. Estimation of Fe(II) and Fe(III) in a given mixture using K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> solution.</li> <li>4. Estimation of Fe(III) and Mn(II) in a mixture using standardized KMnO<sub>4</sub> solution</li> </ul> |
| Dr. Sanjay Mondal<br>CC-4: Organic Chemistry-II   | <ul style="list-style-type: none"> <li>• Stereochemistry II</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Organic Preparations</li> </ul>  |

#### 2<sup>nd</sup> Module (April to June)

| Name of the teacher and Course                    | Theory   | Practical   |
|---|--|---|
| Dr. Suparna Sadhu<br>CC-3: Inorganic Chemistry-II | <ul style="list-style-type: none"> <li>• Acid-Base</li> <li>• Redox Reactions and precipitation reactions</li> </ul> | <ul style="list-style-type: none"> <li>• Estimation of Fe(III) and Cu(II) in a mixture using K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>.</li> <li>▪ Estimation of Fe(III) and Cr(III) in a</li> </ul> |

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| Dr. Sanjay Mondal<br>CC-4: Organic Chemistry-II | <b>Substitution and Elimination Reactions</b> <ul style="list-style-type: none"> <li>Free-radical substitution reaction</li> <li>Nucleophilic substitution reactions</li> <li>Elimination reactions</li> </ul> | mixture using $K_2Cr_2O_7$ <ul style="list-style-type: none"> <li>Purification of the crude product by Crystallization</li> </ul> |
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**Internal Assessment:** 4<sup>th</sup> Week of May

**Theory and Practical Examination:** as per notification of B.U. (Tentatively on June)

### Semester-III

CC-5: Physical Chemistry/CC 6: Inorganic Chemistry-II/CC 7: Organic Chemistry-III/SEC-1

**Credits:** Theory-4, Practical-2,

**Marks:** Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

**1<sup>st</sup>Module(July to September)**

| Name of the teacher and Course                                       | Theory  | Practical   |
|--|---|---|
| Mrs. Pallabi Acharyya<br>Core Course 5 :Physical Chemistry-II (Theo) | <ul style="list-style-type: none"> <li>Transport Processes</li> <li>Application of Thermodynamics – I</li> </ul>  | <ol style="list-style-type: none"> <li>Study of viscosity of unknown liquid (glycerol, sugar) with respect to water.</li> <li>Determination of partition coefficient for the distribution of <math>I_2</math> between water and <math>CCl_4</math>.</li> <li>Determination of <math>K_{eq}</math> for <math>KI + I_2 \rightleftharpoons KI_3</math>, using partition coefficient between water and <math>CCl_4</math>.</li> </ol> |
| Dr. Suparna Sadhu<br>Core Course 6: Inorganic Chemistry-II           | <ul style="list-style-type: none"> <li>Chemical Bonding-I <ol style="list-style-type: none"> <li>Ionic bond</li> <li>Covalent bond</li> </ol> </li> <li>Chemical Bonding-II <ol style="list-style-type: none"> <li>Molecular orbital concept of bonding</li> <li>Metallic Bond</li> </ol> </li> </ul> | <ul style="list-style-type: none"> <li>Iodo/Iodimetric Titrations <ol style="list-style-type: none"> <li>Estimation of <math>Cu(II)</math>.</li> <li>Estimation of Vitamin C.</li> <li>Estimation of arsenite by iodimetric method</li> </ol> </li> </ul>   |
| Dr. Sanjay Mondal<br>CC-7: Organic Chemistry-III                     | <ul style="list-style-type: none"> <li>Chemistry of alkenes and alkynes</li> <li>Addition to <math>C \equiv C</math> (in comparison to <math>C=C</math>)</li> <li>Aromatic Substitution</li> </ul>  | <ul style="list-style-type: none"> <li>Qualitative Analysis of Single Solid Organic Compounds</li> </ul>  |
| Dr. Sanjay Mondal<br>Skill Enhancement Course                        | <ul style="list-style-type: none"> <li>Introduction</li> <li>Analysis of soil</li> </ul>  | <ul style="list-style-type: none"> <li>N/A</li> </ul>   |

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| (SEC-1)<br>[Credits: Theory-2, Marks – 50, Theory – 40, Internal Assessment – 10] | <ul style="list-style-type: none"> <li>• Analysis of water</li> <li>• Analysis of food products</li> </ul> |  |
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## 2<sup>nd</sup> Module (October to December)

| Name of the teacher and Course  | Theory   | Practical   |
|---|--|---|
| Mrs. Pallabi Acharyya<br>Core Course 5 :Physical Chemistry-II (Theo)  | <ul style="list-style-type: none"> <li>• Foundation of Quantum Mechanics</li> </ul>  | 4. Conductometric titration of an acid (strong, weak/ monobasic, dibasic) against strong base.<br>5. Study of saponification reaction conductometrically.<br>6. Verification of Ostwald's dilution law and determination of $K_a$ of weak acid. |
| Dr. Suparna Sadhu<br>Core Course 6: Inorganic Chemistry-II  | <ul style="list-style-type: none"> <li>• <b>Chemical Bonding-II</b></li> <li>1. Weak Chemical Forces</li> <li>• Radioactivity</li> </ul>   | 4. Estimation of Cu in brass.<br>5. Estimation of Cr and Mn in Steel  |
| Dr. Sanjay Mondal<br>CC-7: Organic Chemistry-III  | <ul style="list-style-type: none"> <li>• Carbonyl and Related Compounds</li> <li>• Exploitation of acidity of <math>\alpha</math>-H of C=O</li> <li>• Aldol, Friedel-Crafts, Michael, Knoevenagel, Cannizzaro, Benzoin condensation and Dieckmann condensation</li> <li>• Nucleophilic addition to <math>\alpha,\beta</math>-unsaturated carbonyl system</li> <li>• Substitution at <math>sp^2</math> carbon (C=O system)</li> <li>• Organometallics:</li> </ul> | <ul style="list-style-type: none"> <li>▪ Melting point</li> <li>▪ Preparation of one derivative</li> </ul>  |
| Dr. Sanjay Mondal<br>Skill Enhancement Course (SEC-1)<br>[Credits: Theory-2, Marks – 50, Theory – 40, Internal Assessment – 10] | <ul style="list-style-type: none"> <li>• Chromatography</li> <li>• Ion-exchange</li> <li>• Analysis of cosmetics</li> </ul>  | <ul style="list-style-type: none"> <li>▪ N/A</li> </ul>   |

**Internal Assessment:** 1<sup>st</sup> Week of December

**Theory and Practical Examination:** as per notification of B.U. (Tentatively in December)

## Semester IV

CC 8:Physical Chemistry-III (Theo)/ CC 9: Inorganic Chemistry-III/ CC 10: Organic Chemistry-IV

**Credits:** Theory-4, Practical-2,

**Marks:** Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

**1<sup>st</sup> Module (January-March)**

| Name of the teacher and Course   | Theory   | Practical  |
|--|--|--|
| Mrs. Pallabi Acharyya<br>Core Course 8: Physical Chemistry-III (Theo)  | <ul style="list-style-type: none"><li>• Application of Thermodynamics – II</li><li>• Electrical Properties of molecules</li></ul>                        | <ol style="list-style-type: none"><li>1. Determination of solubility of sparingly soluble salt in water, in electrolyte with common ions and in neutral electrolyte (using common indicator).</li><li>2. Potentiometric titration of Mohr's salt solution against standard <math>K_2Cr_2O_7</math> solution.</li><li>3. Determination of <math>K_{sp}</math> for <math>AgCl</math> by potentiometric titration of <math>AgNO_3</math> solution against standard <math>KCl</math></li></ol> |
| Dr. Suparna Sadhu<br>Core Course 9: Inorganic Chemistry-III  | <ul style="list-style-type: none"><li>• General Principles of Metallurgy</li><li>• Chemistry of s and p Block Elements</li></ul>                         | <ul style="list-style-type: none"><li>▪ Complexometric titration</li><li>1. <math>Zn(II)</math></li><li>2. <math>Zn(II)</math> in a <math>Zn(II)</math> and <math>Cu(II)</math> mixture</li><li>3. <math>Ca(II)</math> and <math>Mg(II)</math> in a mixture</li><li>4. Hardness of water</li></ul>   |
| Dr. Sanjay Mondal<br>CC 10: Organic Chemistry-IV   | <ul style="list-style-type: none"><li>• Nitrogen compounds Reaction</li><li>• Rearrangements Reaction</li><li>• The Logic of Organic Synthesis</li></ul> | <ul style="list-style-type: none"><li>▪ Estimation of glucose by titration using Fehling's solution</li><li>▪ Estimation of Vitamin-C (reduced)</li><li>▪ Estimation of aromatic amine (aniline) by bromination (Bromate-Bromide) method</li><li>▪ Estimation of phenol by bromination (Bromate-Bromide) method</li></ul>  |
| Dr. Sanjay Mondal<br>Skill Enhancement Course (SEC)<br><b>SEC-2: Pharmaceuticals Chemistry</b><br><br>[Credits: Theory-2, Marks – 50, Theory – 40, Internal Assessment – 10] | <ul style="list-style-type: none"><li>• Drugs &amp; Pharmaceuticals</li></ul>  | <ul style="list-style-type: none"><li>▪ N/A</li></ul>  |

**2<sup>nd</sup> Module (April to June)**

| Name of the teacher and Course  | Theory  | Practical  |
|---|---|--|
| Mrs. Pallabi Acharyya<br>Core Course 8: Physical Chemistry-III (Theo) | <ul style="list-style-type: none"><li>• Quantum Chemistry</li></ul> | <ol style="list-style-type: none"><li>4. Effect of ionic strength on the rate of Persulphate – Iodide reaction.</li><li>5. Study of phenol-water phase diagram</li></ol> |
| Dr. Suparna Sadhu   | <ul style="list-style-type: none"><li>• Noble Gases</li></ul>       | <ul style="list-style-type: none"><li>▪ Inorganic preparations</li></ul>   |

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| Core Course 9: Inorganic Chemistry-III   | <ul style="list-style-type: none"> <li>Inorganic Polymers</li> <li>Coordination Chemistry-I</li> </ul> | <ol style="list-style-type: none"> <li>[Cu(CH<sub>3</sub>CN)<sub>4</sub>]PF<sub>6</sub>/ClO<sub>4</sub></li> <li>Potassium dioxalatodiaquachromate(III)</li> <li>Tetraamminecarbonatocobalt (III) ion</li> <li>Potassium tris(oxalate)ferrate(III)</li> <li>Tris-(ethylenediamine) nickel(II) chloride.</li> <li>[Mn(acac)<sub>3</sub>] and Fe(acac)<sub>3</sub>] (acac= acetylacetonate)</li> </ol> |
| Dr. Sanjay Mondal<br>CC 10: Organic Chemistry-IV   | <ul style="list-style-type: none"> <li>Organic Spectroscopy</li> </ul>                                 | <ul style="list-style-type: none"> <li>Estimation of formaldehyde (Formalin)</li> <li>Estimation of acetic acid in commercial vinegar</li> <li>Estimation of urea (hypobromite method)</li> <li>Estimation of saponification value of oil/fat/ester</li> </ul>   |
| Dr. Sanjay Mondal<br>Skill Enhancement Course (SEC)<br><b>SEC-2: Pharmaceuticals Chemistry</b><br><br>[Credits: Theory-2, Marks – 50, Theory – 40, Internal Assessment – 10] | <ul style="list-style-type: none"> <li>Drugs &amp; Pharmaceuticals</li> </ul>                          | <ul style="list-style-type: none"> <li>N/A</li> </ul>  |

**Internal Assessment: 4<sup>th</sup> Week of May**

**Theory and Practical Examination:** as per notification of B.U. (Tentatively on June)

### Semester V

**CC11: Inorganic Chemistry-IV/ CC 12: Organic Chemistry-V/ DSE 1: Advanced Physical Chemistry (Theo)**

**Credits:** Theory-4, Practical-2,

**Marks:** Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

**1<sup>st</sup> Module(July to September)**

| Name of the teacher and Course                   | Theory  | Practical  |
|--|---|--|
| Dr.Suparna Sadhu<br>CC11: Inorganic Chemistry-IV | <ul style="list-style-type: none"> <li>Coordination Chemistry-II</li> </ul> | <ul style="list-style-type: none"> <li><b>Chromatography of metal ions</b><br/>Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions:<br/>1. Ni (II) and Co (II)<br/>2. Fe (III) and Al (III).</li> <li><b>Spectrophotometry</b><br/>1. Measurement of 10D<sub>q</sub> of 3d metal complexes by spectrophotometric</li> </ul> |

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|  |  | method.<br>2. Determination of $\lambda_{\max}$ of $\text{KMnO}_4$ and $\text{K}_2\text{Cr}_2\text{O}_7$   |
| Dr. Sanjay Mondal<br>CC 12: Organic Chemistry-V                    | <ul style="list-style-type: none"> <li>• Carbocycles and Heterocycles</li> <li>• Cyclic Stereochemistry</li> <li>• Pericyclic reactions</li> </ul> | <ul style="list-style-type: none"> <li>▪ Chromatographic Separations.</li> </ul>   |
| Mrs. Pallabi Acharyya<br>DSE 1: Advanced Physical Chemistry (Theo) | <ul style="list-style-type: none"> <li>• Crystal Structure</li> <li>• Statistical Thermodynamics</li> </ul>  | <p><b>Computer Programming based on numerical methods for:</b></p> <ol style="list-style-type: none"> <li>1. Roots of equations: (e.g. volume of van der Waals gas and comparison with ideal gas, pH of a weak acid)</li> <li>2. Numerical differentiation (e.g., change in pressure for small change in volume of a van der Waals gas, potentiometric titrations)</li> </ol>  |
| Dr. Suparna Sadhu<br>DSE- 2 : Analytical methods in chemistry      | <p>Qualitative and quantitative aspects of analysis<br/>Optical methods of analysis<br/>Thermal methods of analysis</p>                            | <ul style="list-style-type: none"> <li>▪ <b>Separation Techniques – Chromatography</b> <ol style="list-style-type: none"> <li>1. Separation and identification of the monosaccharides in a mixture (glucose &amp; fructose) by paper chromatography. Reporting the <math>R_f</math> values.</li> <li>2. Separate a mixture of Sudan yellow and Sudan Red by TLC technique and identify them on the basis of their <math>R_f</math> values.</li> <li>3. Separation of the active ingredients of plants, flowers and juices by TLC</li> </ol> </li> <li>▪ <b>Spectrophotometry</b> <ol style="list-style-type: none"> <li>1. Determination of <math>pK_a</math> values of indicator using spectrophotometry</li> <li>2. Determination of chemical oxygen demand (COD)</li> <li>3. Determination of Biological oxygen demand (BOD)</li> </ol> </li> </ul> |

## 2<sup>nd</sup> Module (October to December)

| Name of the teacher and Course                    | Theory   | Practical   |
|---|--|---|
| Dr. Suparna Sadhu<br>CC11: Inorganic Chemistry-IV | <ul style="list-style-type: none"> <li>• Chemistry of d- and f- block elements</li> </ul> <p>Transition Elements<br/>Lanthanoids and Actinoids</p> | <ul style="list-style-type: none"> <li>▪ Gravimetry           <ol style="list-style-type: none"> <li>1. Estimation of nickel (II) using Dimethylglyoxime (DMG).</li> <li>2. Estimation of copper as <math>\text{CuSCN}</math></li> <li>3. Estimation of Al (III) by precipitating with oxine and weighing as <math>\text{Al(oxine)}_3</math> (aluminium oxinate)</li> </ol> </li> </ul> |

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|  |   | 4. Estimation of chloride.  |
| Dr. Sanjay Mondal<br>CC 12: Organic Chemistry-V                    | <ul style="list-style-type: none"> <li>• Carbohydrates</li> <li>• Biomolecules</li> <li>• Alkaloids and Terpenoids</li> </ul> | <ul style="list-style-type: none"> <li>▪ Spectroscopic Analysis of Organic Compounds</li> </ul>   |
| Mrs. Pallabi Acharyya<br>DSE 1: Advanced Physical Chemistry (Theo) | <b>Special selected topics</b><br>Specific heat of solid<br>3rd law<br>Polymers<br>Dipole moment and polarizability           | 3. Numerical integration (e.g. entropy/enthalpy change from heat capacity data), probability distributions (gas kinetic theory) and mean values<br>4. Matrix operations (Application of Gauss-Siedel method in colourimetry)  |
| Dr. Suparna Sadhu<br>DSE- 2 : Analytical methods in chemistry      | <ul style="list-style-type: none"> <li>• Electroanalytical methods</li> <li>• Separation techniques</li> </ul>                | <ul style="list-style-type: none"> <li>▪ <b>Solvent Extractions</b></li> <li>1. To separate a mixture of Ni<sup>2+</sup> &amp; Fe<sup>2+</sup> by complexation with DMG and extracting the Ni<sup>2+</sup>- DMG complex in chloroform, and determine its concentration by spectrophotometry.</li> <li>▪ <b>Analysis of soil:</b></li> <li>a. Determination of pH of soil.</li> <li>b. Total soluble salt</li> <li>c. Estimation of calcium, magnesium, phosphate, nitrate</li> <li>3. Ion exchange: a. Determination of exchange capacity of cation exchange resins and anion exchange resins.</li> </ul> |

**Internal Assessment:** 1<sup>st</sup> Week of December

**Theory and Practical Examination:** as per notification of B.U. (Tentatively on December)

### Semester VI

**CC 13: Inorganic Chemistry-V/ CC 14: Physical Chemistry-IV / DSE-3: Polymer Chemistry/ DSE-4**  
 :Inorganic materials of industrial importance “or” Dissertation followed by power point presentation

**Credits:** Theory-4, Practical-2,

**Marks:** Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

#### 1st Module(January - March)

| Name of the teacher and Course        | Theory  | Practical   |
|---------------------------------------|---|---|
| Dr. Suparna Sadhu<br>CC 13: Inorganic | <ul style="list-style-type: none"> <li>• Bioinorganic Chemistry</li> <li>• Reaction Kinetics and</li> </ul> | <ul style="list-style-type: none"> <li>▪ Qualitative semimicro analysis</li> <li>Qualitative semimicro analysis of</li> </ul> |



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| Chemistry-V<br>Mrs. Pallabi Acharyya<br>CC 14: Physical Chemistry-IV  | Mechanism <ul style="list-style-type: none"> <li>• Molecular Spectroscopy</li> <li>• Photochemistry</li> </ul>  | mixtures containing four radicals <ol style="list-style-type: none"> <li>1. Determination of surface tension of a liquid using Stalagmometer</li> <li>2. Determination of CMC from surface tension measurements.</li> </ol>   |
| Dr. Sanjay Mondal<br><b>DSE-3: Polymer Chemistry</b>  | <ul style="list-style-type: none"> <li>• Introduction and history of polymeric materials</li> <li>• Functionality and its importance</li> <li>• Kinetics of Polymerization</li> </ul> | <ul style="list-style-type: none"> <li>▪ Polymer Synthesis</li> </ul>   |
| Dr. Suparna Sadhu<br>DSE-4: Inorganic materials of industrial importance<br>Or<br>Dissertation followed by power point presentation | <ul style="list-style-type: none"> <li>• Silicate Industries</li> <li>• Fertilizers</li> <li>• Surface Coatings</li> </ul>  | <ol style="list-style-type: none"> <li>1. Determination of free acidity in ammonium sulphate fertilizer.</li> <li>2. Estimation of Calcium in Calcium ammonium nitrate fertilizer.</li> <li>3. Estimation of phosphoric acid in superphosphate fertilizer.</li> <li>4. Determination of composition of dolomite (by complexometric titration).</li> </ol> |

## 2<sup>nd</sup> Module (April to June)

| Name of the teacher and Course  | Theory  | Practical   |
|---|---|---|
| Dr. Suparna Sadhu<br>CC 13: Inorganic Chemistry-V   | <ul style="list-style-type: none"> <li>• Organometallic Chemistry</li> <li>• Catalysis by Organometallic Compounds</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Qualitative semimicro analysis of mixtures containing <b>unknown</b> four radicals (Analysis of minimum 10 unknown samples)</li> </ul>   |
| Mrs. Pallabi Acharyya<br>CC 14: Physical Chemistry-IV   | <ul style="list-style-type: none"> <li>• Surface phenomenon</li> </ul>  | <ol style="list-style-type: none"> <li>3. Verification of Beer and Lambert's Law for KMnO<sub>4</sub> and K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> solution.</li> <li>4. Determination of pH of unknown buffer, spectrophotometrically</li> </ol> |
| Dr. Sanjay Mondal<br><b>DSE-3: Polymer Chemistry</b>  | <ul style="list-style-type: none"> <li>• Determination of molecular weight of polymers</li> <li>• Glass transition temperature (T<sub>g</sub>) and determination of T<sub>g</sub></li> <li>• Polymer Solution</li> <li>• Properties of Polymer</li> </ul> | <ul style="list-style-type: none"> <li>▪ Polymer Characterization</li> <li>▪ Polymer Analysis</li> </ul>  |
| Dr. Suparna Sadhu<br>DSE-4: Inorganic materials of industrial importance<br>Or<br>Dissertation followed by power point presentation | <ul style="list-style-type: none"> <li>• Batteries</li> <li>• Alloys</li> <li>• Catalysis</li> <li>• Chemical explosives</li> </ul>   | <ol style="list-style-type: none"> <li>5. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples.</li> <li>6. Analysis of Cement.</li> <li>7. Preparation of pigment (zinc oxide).</li> </ol>   |

**Internal Assessment:** 4<sup>th</sup> Week of May

**Theory and Practical Examination:** as per notification of B.U. (Tentatively on June)

**Counselling Programme – Final week of June-** General outline on the admission and scope of higher education and related jobs

S.C.C. College