Academic Calendar & Plan

Academic Year 2020-21

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

Department of Chemistry

Sarat Centenary College, Dhaniakhali, Hooghly

Semester-1

Orientation Programme – 1st week of July: General outline of Chemistrysyllabus and its Scope & Importance

CC-1A/GE-1 Title: Atomic Structure, Chemical Periodicity, Acids and Bases, Redox Reactions, General Organic Chemistry & Aliphatic Hydrocarbons

Credits: Theory-4, Practical-2,

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

1st Module (July-September)

Name of the teacher and Course	Theory	Practical
Mrs. PallabiAcharyya CC-1A/ General Organic Chemistry & Aliphatic Hydrocarbons	**Organic Chemistry** • Fundamentals of Organic Chemistry • Stereochemistry	▪ Qualitative Analysis of Single Solid Organic Compound(s) ▪ Detection of special elements (N, Cl, and S) in organic compounds.
Dr.Suparna Sadhu Inorganic Chemistry	• Atomic Structure • Chemical Periodicity	▪ Inorganic Chemistry 1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture. 2. Estimation of oxalic acid by titrating it with $KMnO_4$. 3. Estimation of water of crystallization in Mohr's salt by titrating with $KMnO_4$.

2nd Module (October to December)

Name of the teacher and Course	Theory	Practical
Mrs. PallabiAcharyya CC-1A/ General Organic Chemistry & Aliphatic Hydrocarbons	▪ Aliphatic Hydrocarbons ▪ Alkanes, Alkene, Alkynes ▪ Reactions	▪ Solubility and Classification ▪ Detection of functional groups:
Dr.Suparna Sadhu Inorganic Chemistry	• Acids and bases • Redox reactions	▪ Estimation of Fe (II) ions by titrating it with $K_2Cr_2O_7$ using internal indicator. ▪ Estimation of Cu (II) ions iodometrically using $Na_2S_2O_3$.

Internal Assessment: 1st Week of December

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

Semester-II

CC-1B/GE2: Course Title: States of Matter & Chemical Kinetics, Chemical Bonding & Molecular Structure, P-Block Elements

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 Inorganic Chemistry	▪ Chemical Bonding and Molecular Structure a. Ionic Bonding b. Covalent bonding c. MO Approach	▪ Qualitative semi-micro analysis of mixtures containing three radicals
Mrs. PallabiAcharyya Physical Chemistry	Kinetic Theory of Gases and Real gases Liquids	▪ 1. Surface tension measurement (use of organic solvents excluded). a. Determination of the surface tension of a liquid or a dilute solution using a Stalagmometer. b. Study of the variation of surface tension of a detergent solution with concentration 2. Viscosity measurement (use of organic solvents excluded) a. Determination of the relative and absolute viscosity of a liquid or dilute solution using an Ostwald's viscometer b. Study of the variation of viscosity of an aqueous solution with concentration of solute

2nd Module (April to June)

Name of the teacher and Course	Theory	Practical
Dr.Suparna Sadhu Inorganic Chemistry	▪ Comparative study of p-block elements	▪ Qualitative semi-micro analysis of **unknown**mixtures containing three radicals
Mrs. PallabiAcharyya Physical Chemistry	Solids Chemical Kinetics	3. Study the kinetics of the following reactions a. Initial rate method: Iodide-persulphate reaction b. Integrated rate method: i. Acid hydrolysis of methyl acetate with hydrochloric acid ii. Compare the strengths of HCl and H2SO4 by studying kinetics of hydrolysis of methyl acetate.

Internal Assessment: 4th Week of May

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

Semester-III

CC-1C :Course Title: Chemical energetic, equilibria, organic chemistry

Credits: Theory-4, Practical-2,
Marks: Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

1st Module(July to September)

Name of the teacher and Course	Theory	Practical
Mrs. PallabiAcharyya CC-1C (Theo): Chemical energetic, equilibria, organic chemistry	**Physical Chemistry** • Chemical Energetics • Chemical Equilibrium Ionic Equilibria	**Physical Chemistry** • Ionic Equilibria • Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps • Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method (using following buffers) a. Sodium acetate-acetic acid b. Ammonium chloride-ammonium hydroxide • Study of the solubility of benzoic acid in water

2nd Module (October to December)

Name of the teacher and Course	Theory	Practical
Mrs. PallabiAcharyya CC-1C (Theo): Chemical energetic, equilibria, organic chemistry	**Organic Chemistry** Aromatic Hydrocarbons Organometallic Compounds Aryl Halides Alcohols, Phenols and Ethers Carbonyl Compounds	**Identification of a pure organic compound by chemical test** • Solid compounds: oxalic acid, succinic acid, resorcinol, urea, glucose, benzoic acid and salicylic acid. • Liquid Compounds: acetone, aniline and nitrobenzene.

Internal Assessment: 1st Week of December

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

Semester IV

CC-1D: Course Title: Solutions, Phase Equilibria, Conductance, Electrochemistry & Analytical and Environmental Chemistry

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
Mrs. PallabiAcharyya **CC-1D (Theo):** Solutions, Phase Equilibria, Conductance, Electrochemistry & Analytical and Environmental Chemistry	**Physical Chemistry** Solutions Phase Equilibria Conductance Electromotive force	**Physical Chemistry** • Distribution Law Study of the equilibrium of one of the following reactions by the distribution method • Conductance a) Determination of dissociation constant of a weak acid (cell constant, equivalent conductance are also determined) b) Perform the following conductometric titration: Weak acid vs. strong base • Potentiometry Perform the following potentiometric titration: Potassium dichromate vs. Mohr's salt

2nd Module (April to June)

Name of the teacher and Course	Theory	Practical
Mrs. PallabiAcharyya **CC-1D (Theo):** Solutions, Phase Equilibria, Conductance, Electrochemistry & Analytical and Environmental Chemistry	**Analytical and Environmental Chemistry** Chemical Analysis Environmental Chemistry	**Analytic and Environmental Chemistry** 1. To find the total hardness of water by EDTA titration. 2. To find the PH of an unknown solution by comparing color of a series of HCl solutions + 1 drop of methyl orange, and a similar series of NaOH solutions + 1 drop of phenolphthalein. 3. To determine the rate constant for the acid catalysed hydrolysis of an ester. 4. Determination of the strength of the H2O2 sample. 5. To determine the solubility of a sparingly soluble salt, e.g. KHTa (one bottle)

Internal Assessment: 4th Week of May
Theory and Practical Examination: as per notification of B.U. (Tentatively on June)

Semester V

DSE-1A: Course Title: Transition Metal & Coordination Chemistry, Analytical and Industrial Chemistry

Credits: Theory-4, Practical-2,
Marks: Theory – 40, Practical – 20, Internal Assessment – 10, Attendance-05=75

1st Module(July to September)

Name of the teacher and Course	Theory	Practical
Dr.Suparna Sadhu Inorganic Chemistry	• Transition Elements (3d series) • Coordination Chemistry • Crystal Field Theory	▪ Inorganic Chemistry 1. Gravimetric and Complexometric estimation of metals ions: a. Estimation of the amount of nickel present in a given solution as bis(dimethylglyoximato) nickel(II) or aluminium as oxine in a given solution gravimetrically. b. Estimation of (i) Mg^{2+} or (ii) Zn^{2+} by complexometric titrations using EDTA. 2. Preparation of any two of the following complexes and measurement of their conductivity: a. tetraamminecarbonatocobalt (III) nitrate b. tetraamminecopper (II) sulphate c. potassium trioxalatoferrate (III) trihydrate 3. Compare the conductance of the complexes with that of M/1000 solution of NaCl, $MgCl_2$ and $LiCl_3$

2nd Module (October to December)

Name of the teacher and Course	Theory	Practical
Dr.Suparna Sadhu Analytical and Industrial Chemistry	• Error Analysis and Computer Applications • Industrial Chemistry	▪ Analytical and Industrial Chemistry 1. Titration of Na_2CO_3 and $NaHCO_3$ mixture vs. HCl using phenolphthalein and methyl orange indicators. 2. Titration of HCl and CH_3COOH mixture vs. NaOH using two different indicators to find the composition. 3. Estimation of the total hardness of water sample by EDTA titration. 4. Estimation of available oxygen in pyrolusite.

Internal Assessment: 1st Week of December

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

Semester VI

DSE-1B: Course Title: Functional Group Organic Chemistry and Industrial Chemistry

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. Sanjay Mondal DSE-1B/ Functional Group Organic Chemistry and Industrial Chemistry	• Carboxylic Acids and Their Derivatives • Amines and Diazonium Salts	**Organic Chemistry** ▪ Nitration of aromatic compounds ▪ Condensation reactions ▪ Hydrolysis of amides

2nd Module (April to June)

Name of the teacher and Course	Theory	Practical
Dr. Sanjay Mondal DSE-1B/ Functional Group Organic Chemistry and Industrial Chemistry	• Amino Acids and Carbohydrates • Industrial Chemistry	▪ Acetylation of aromatic amines ▪ Purification of the crude product is to be made by crystallisation from water/alcohol.

Internal Assessment: 4th 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