

# SIDDHINATH MHAVIDYALAYA

## DEPARTMENT OF CHEMISTRY

### TEACHING PLAN -2019-2020

TEACHING PLAN OF SEMESTER – I (2018-2019)				
PAPER DSC – 1A (CC-1) Atomic Structure, Bonding, general organic chemistry & aliphatic hydrocarbons				
	MODULE	TEACHER	NO OF LECTURES	TO BE COMPLETED
Unit- I	Atomic Structure	P.D	06	2 MONTHS
Unit- II	Chemical Bonding and Molecular Structure		10	
Unit- III	Fundamentals of Organic Chemistry		06	
Unit- IV	Stereochemistry		05	
Unit- V	Aliphatic Hydrocarbons (Alkanes, Alkenes, Alkynes )		10	
PAPER DSC – 1A (P)				
Unit- I	Estimation of oxalic acid by titrating it with $\text{KMnO}_4$ .	P.D	09	2 MONTHS
Unit- II	Estimation of Fe (II) ions by titrating it with $\text{K}_2\text{Cr}_2\text{O}_7$ using internal indicator.			
Unit- III	Estimation of Cu (II) ions iodometrically using $\text{Na}_2\text{S}_2\text{O}_3$ .			
Unit- IV	Detection of extra elements (N, S, Cl, Br, I) in organic compounds (containing upto two extra elements)			

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### TEACHING PLAN -2019-2020

TEACHING PLAN OF SEMESTER – III (2019-2020)				
PAPER DSC – 1C(CC-3): Solutions, Phase equilibrium, Conductance, Electrochemistry & Functional Organic Chemistry				
	MODULE	TEACHER	NO OF LECTURES	TO BE COMPLETED
Unit- I	Chemical Energetic		08	2 MONTHS
Unit- II	Chemical Equilibrium		05	
Unit- III	Ionic Equilibria		05	
Unit- IV	Aromatic hydrocarbons		05	
Unit- V	Alkyl and Aryl Halides		04	
Unit- VI	Alcohols, Phenols and Ethers		12	2 MONTHS
Unit- VII				
Unit- VIII				
<b>PAPER DSC – 1B (P)</b>				
Unit- I	Preparation of buffer solutions (Sodium acetate-acetic acid )		09	2 MONTHS
Unit- II	Purification of organic compounds by crystallization (from water and alcohol) and distillation.			
Unit- III	Preparations: Mechanism of various reactions involved to be discussed. Recrystallisation, determination of melting point and calculation of quantitative yields to be done. (Bromination of Phenol/Aniline , Benzoylation of amines/phenols)			

<b>TEACHING PLAN OF SEMESTER – I MATH (H)</b>				
<b>PAPER GE3T: Chemical Energetics, Equilibria, Organic Chemistry.</b>				
	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>
Unit- I	<b>Chemical Energetics</b>	PARNAB DOLUI	14	2 MONTHS
Unit- II	<b>Chemical Equilibrium</b>		08	
Unit- III	<b>Ionic Equilibria</b>			
Unit- IV	<b>Aromatic Hydrocarbons</b>			
Unit- V	<b>Organometallic Compounds</b>			
Unit- VI	<b>Aryl Halides</b>			
Unit- VII	<b>Alcohols, Phenols and Ethers</b>			
Unit- VIII	<b>Carbonyl Compounds</b>			
<b>PAPER GE-3P: LAB: Practicals</b>				
Unit- I	<b>Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method (using following buffers) [Sodium acetate-acetic acid]</b>	PARNAB DOLUI		2 MONTHS
Unit- II	<b>Identification of a pure organic compound (Solid compounds: oxalic acid, tartaric acid, succinic acid, resorcinol, urea, glucose, benzoic acid and salicylic acid. Liquid Compounds: methyl alcohol, ethyl alcohol, acetone, aniline, dimethylaniline, benzaldehyde, chloroform and nitrobenzene)</b>			

<b>TEACHING PLAN OF SEMESTER – III MATH (H)</b>				
<b>PAPER GE3T: Chemical Energetics, Equilibria, Organic Chemistry.</b>				
	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>
Unit- I	<b>Chemical Energetics</b>	PARNAB DOLUI	14	2 MONTHS
Unit- II	<b>Chemical Equilibrium</b>		08	
Unit- III	<b>Ionic Equilibria</b>		08	
Unit- IV	<b>Aromatic Hydrocarbons</b>		06	
Unit- V	<b>Organometallic Compounds</b>		02	
Unit- VI	<b>Aryl Halides</b>		03	
Unit- VII	<b>Alcohols, Phenols and Ethers</b>		11	
Unit- VIII	<b>Carbonyl Compounds</b>		08	
<b>PAPER GE-3P: LAB: Practicals</b>				
Unit- I	<b>Preparation of buffer solutions and find the pH of an unknown buffer solution by colour matching method (using following buffers) [Sodium acetate-acetic acid]</b>	PARNAB DOLUI	04	2 MONTHS
Unit- II	<b>Identification of a pure organic compound (Solid compounds: oxalic acid, tartaric acid, succinic acid, resorcinol, urea, glucose, benzoic acid and salicylic acid. Liquid Compounds: methyl alcohol, ethyl alcohol, acetone, aniline, dimethylaniline, benzaldehyde, chloroform and nitrobenzene)</b>		12	

**TEACHING PLAN OF SEMESTER – II (2018-2019)**

**PAPER DSC – -1B (CC-2): Chemical Energetics, Equilibria & Functional Organic Chemistry .**

	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>
Unit- I	<b>Atomic Structure</b>	<b>P.D</b>	06	2 MONTHS
Unit- II	<b>Chemical Bonding and Molecular Structure</b>		10	
Unit- III	<b>Fundamentals of Organic Chemistry</b>		06	
Unit- IV	<b>Stereochemistry</b>		05	
Unit- V	<b>Aliphatic Hydrocarbons (Alkanes, Alkenes, Alkynes )</b>		10	
Unit- VI				
<b>PAPER DSC – 1A (P)</b>				
Unit- I	<b>Estimation of oxalic acid by titrating it with KMnO<sub>4</sub>.</b>	<b>P.D</b>	09	2 MONTHS
Unit- II	<b>Estimation of Fe (II) ions by titrating it with K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> using internal indicator.</b>			
Unit- III	<b>Estimation of Cu (II) ions iodometrically using Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>.</b>			
Unit- IV	<b>Detection of extra elements (N, S, Cl, Br, I) in organic compounds (containing upto two extra elements)</b>		05	

<b>TEACHING PLAN OF SEMESTER – IV (2019-2020)</b>				
<b>PAPER DSC1DT: Coordination Chemistry, States of matter Chemical Kinetics</b>				
	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>
Unit- I	<b>Transition Elements (3d series)</b>		04	2 MONTHS
Unit- II	<b>Coordination Chemistry</b>		07	
Unit- III	<b>Crystal Field Theory</b>		05	
Unit- IV	<b>Kinetic Theory of Gases , Liquids &amp; Solids</b>		10	
Unit- V	<b>Chemical Kinetics</b>		08	
<b>PAPER DSC1DP: Coordination Chemistry, States of matter &amp; Chemical Kinetics</b>				
Unit- I	Semi-micro qualitative analysis using H <sub>2</sub> S of mixtures - not more than four ionic species (two anions and two cations and excluding insoluble salts) out of the following: Cations : NH <sub>4</sub> <sup>+</sup> , Pb <sup>2+</sup> , Ag <sup>2+</sup> , Bi <sup>3+</sup> , Cu <sup>2+</sup> , Cd <sup>2+</sup> , Sn <sup>2+</sup> , Fe <sup>3+</sup> , Al <sup>3+</sup> , Co <sup>2+</sup> , Cr <sup>3+</sup> , Ni <sup>2+</sup> , Mn <sup>2+</sup> , Zn <sup>2+</sup> , Ba <sup>2+</sup> , Sr <sup>2+</sup> , Ca <sup>2+</sup> , K <sup>+</sup> Anions : CO <sub>3</sub> <sup>2-</sup> , S <sup>2-</sup> , SO <sub>2</sub> <sup>-</sup> , S <sub>2</sub> O <sub>3</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> , CH <sub>3</sub> COO <sup>-</sup> , Cl <sup>-</sup> , Br <sup>-</sup> , I <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> ,SO <sub>4</sub> <sup>2-</sup> , PO <sub>4</sub> <sup>3-</sup> , BO <sub>3</sub> <sup>3-</sup> , C <sub>2</sub> O <sub>4</sub> <sup>2-</sup> , F <sup>-</sup>		10	2 MONTHS
Unit- II	Determination of the surface tension of a liquid or a dilute solution using a stalagmometer.		04	
Unit- III	Determination of the relative and absolute viscosity of a liquid or dilute solution using an Ostwald's viscometer.		04	

**TEACHING PLAN OF SEMESTER – IV (2019-2020)**

**PAPER SEC2T: Analytical Clinical Biochemistry**

	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>
Unit- I	<b>Carbohydrates: Biological importance of carbohydrates, Metabolism, Cellular currency of energy (ATP), Glycolysis, Alcoholic and Lactic acid fermentations, Krebs cycle. Isolation and characterization of polysachharides.</b>	PARNAB DOLUI	04	2 MONTHS
Unit- II	<b>Proteins: Classification, biological importance; Primary and secondary and tertiary structures of proteins: <math>\alpha</math>-helix and <math>\beta</math>-pleated sheets, Isolation, characterization, denaturation of proteins.</b>		04	
Unit- III	<b>Enzymes: Nomenclature, Characteristics (mention of Ribozymes), Classification; Active site, Mechanism of enzyme action, Stereospecificity of enzymes, Coenzymes and cofactors, Enzyme inhibitors, Introduction to Biocatalysis: Importance in "Green Chemistry" and Chemical Industry.</b>		05	
Unit- IV	<b>Lipids: Classification. Biological importance of triglycerides and phosphoglycerides and cholesterol; Lipid membrane, Liposomes and their biological functions and underlying applications. Lipoproteins.</b>		10	
Unit- V	<b>Hormone : Properties, functions and biochemical functions of steroid hormones. Biochemistry of peptide hormones.</b>		08	
Unit- VI	<b>Enzymes: Nomenclature, classification, effect of pH, temperature on enzyme activity, enzyme inhibition</b>			
<b>PAPER SEC2P: Practical</b>				
Unit- I	<b>Determination of the iodine number of oil.</b>	PARNAB DOLUI	10	2 MONTHS
Unit- II	<b>Determination of the saponification number of oil.</b>		04	
Unit- III	<b>Determination of nucleic acids</b>		04	
Unit- IV	<b>Isolation of protein</b>			

**TEACHING PLAN OF SEMESTER – IV (2019-2020)**

**PAPER SEC2T: Analytical Clinical Biochemistry**

	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>
Unit- I	<b>Carbohydrates: Biological importance of carbohydrates, Metabolism, Cellular currency of energy (ATP), Glycolysis, Alcoholic and Lactic acid fermentations, Krebs cycle. Isolation and characterization of polysachharides.</b>	PARNAB DOLUI	04	2 MONTHS
Unit- II	<b>Proteins: Classification, biological importance; Primary and secondary and tertiary structures of proteins: <math>\alpha</math>-helix and <math>\beta</math>-pleated sheets, Isolation, characterization, denaturation of proteins.</b>		04	
Unit- III	<b>Enzymes: Nomenclature, Characteristics (mention of Ribozymes), Classification; Active site, Mechanism of enzyme action, Stereospecificity of enzymes, Coenzymes and cofactors, Enzyme inhibitors, Introduction to Biocatalysis: Importance in "Green Chemistry" and Chemical Industry.</b>		05	
Unit- IV	<b>Lipids: Classification. Biological importance of triglycerides and phosphoglycerides and cholesterol; Lipid membrane, Liposomes and their biological functions and underlying applications. Lipoproteins.</b>		10	
Unit- V	<b>Hormone : Properties, functions and biochemical functions of steroid hormones. Biochemistry of peptide hormones.</b>		08	
Unit- VI	<b>Enzymes: Nomenclature, classification, effect of pH, temperature on enzyme activity, enzyme inhibition</b>			
<b>PAPER SEC2P: Practical</b>				
Unit- I	<b>Determination of the iodine number of oil.</b>	PARNAB DOLUI	10	2 MONTHS
Unit- II	<b>Determination of the saponification number of oil.</b>		04	
Unit- III	<b>Determination of nucleic acids</b>		04	
Unit- IV	<b>Isolation of protein</b>			



**TEACHING PLAN OF SEMESTER – II (2019-2020)**

**PAPER GE2 T : STATES OF MATTER & CHEMICAL KINETICS, CHEMICAL BONDING & MOLECULAR STRUCTUR, p-BLOCK ELEMENTS**

	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>
Unit- I	<b>Kinetic Theory of Gases and Real gases</b>	PARNAB DOLUI	08	3 MONTHS
			06	
Unit- II	<b>Liquids</b>		04	
Unit- III	<b>Solids</b>		04	
Unit- IV	<b>Chemical Kinetics</b>		08	
Unit- V	<b>Chemical Bonding and Molecular Structure</b>		06	
Unit- VI	<b>Comparative study of p-block elements</b>		05	
<b>PAPER GE2 P-LAB: STATES OF MATTER &amp; CHEMICAL KINETICS, CHEMICAL BONDING &amp; MOLECULAR STRUCTUR, p-BLOCK ELEMENTS</b>				
Unit- I	<b>Determination of the surface tension of a liquid or a dilute solution using a Stalagmometer</b>	PARNAB DOLUI	04	
Unit- II	<b>Determination of the relative and absolute viscosity of a liquid or dilute solution using an Ostwald's viscometer</b>		04	
Unit- III	<b>Qualitative semimicro analysis of mixtures containing three radicals. Emphasis should be given to the understanding of the chemistry of different reactions. Acid Radicals: Cl-, Br-, I-, NO<sub>2</sub>-, NO<sub>3</sub>-, S<sub>2</sub>-, SO<sub>4</sub><sup>2-</sup>, PO<sub>4</sub><sup>3-</sup>, BO<sub>3</sub><sup>3-</sup>, H<sub>3</sub>BO<sub>3</sub>. Basic Radicals: Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>, Sr<sup>2+</sup>, Ba<sup>2+</sup>, Cr<sup>3+</sup>, Mn<sup>2+</sup>, Fe<sup>3+</sup>, Ni<sup>2+</sup>, Cu<sup>2+</sup>, NH<sub>4</sub><sup>+</sup>.</b>		10	

**TEACHING PLAN OF SEMESTER – IV (2019-2020)**

**PAPER GE4T : Solutions, Phase Equilibria, Conductance, Electrochemistry & Analytical and Environmental Chemistry**

	<b>MODULE</b>	<b>TEACHER</b>	<b>NO OF LECTURES</b>	<b>TO BE COMPLETED</b>	
Unit- I	<b>Solutions</b>	PARNAB DOLUI	06	2 MONTHS	
Unit- II	<b>Phase Equilibria</b>		04		
Unit- III	<b>Conductance</b>		08		
Unit- IV	<b>Electromotive force</b>		06		
Unit- V	<b>Chemical Analysis</b>		07		
Unit- VI	<b>Environmental Chemistry</b>		05	2 MONTHS	
<b>PAPER GE4T: Practical</b>					
Unit- I	<b>Determination of dissociation constant of a weak acid (cell constant, equivalent conductance are also determined)</b>	PARNAB DOLUI	04		2 MONTHS
Unit- II	<b>Determination of the critical solution temperature and composition of the phenol water system and study of the effect of impurities on it</b>		04		
Unit- III	<b>To find the total hardness of water by EDTA titration.</b>		03		
Unit- IV	<b>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.</b>		04		