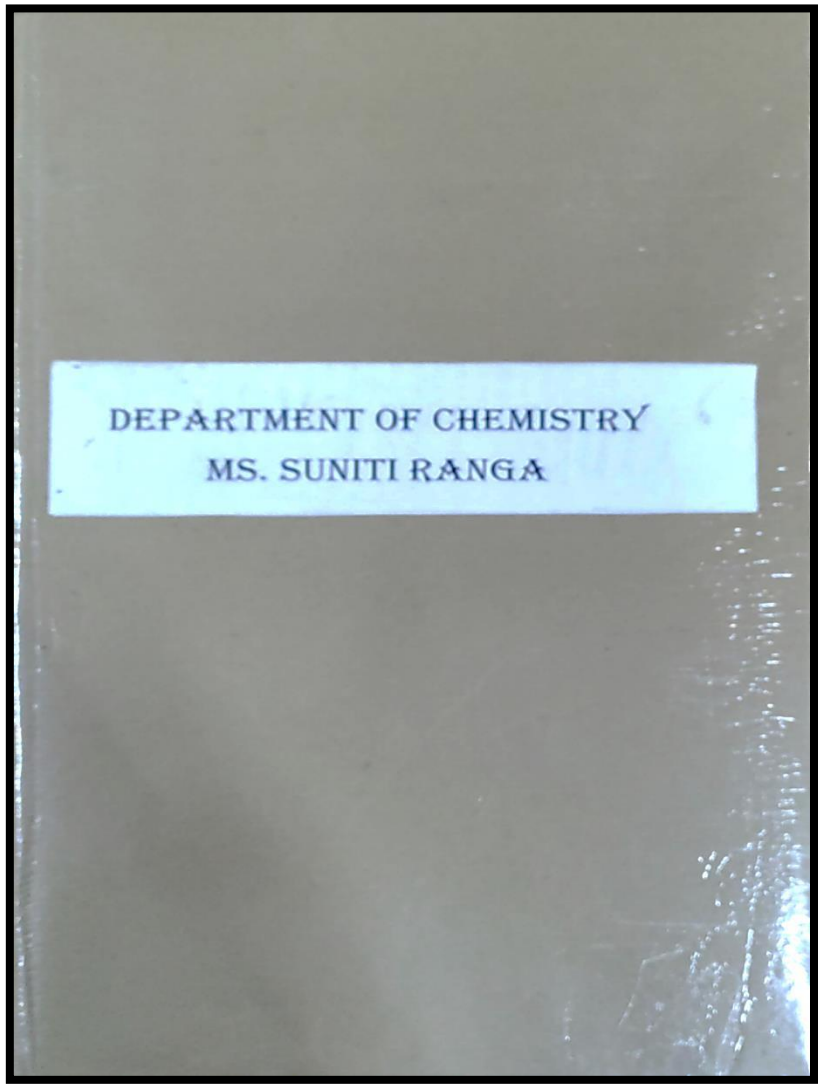
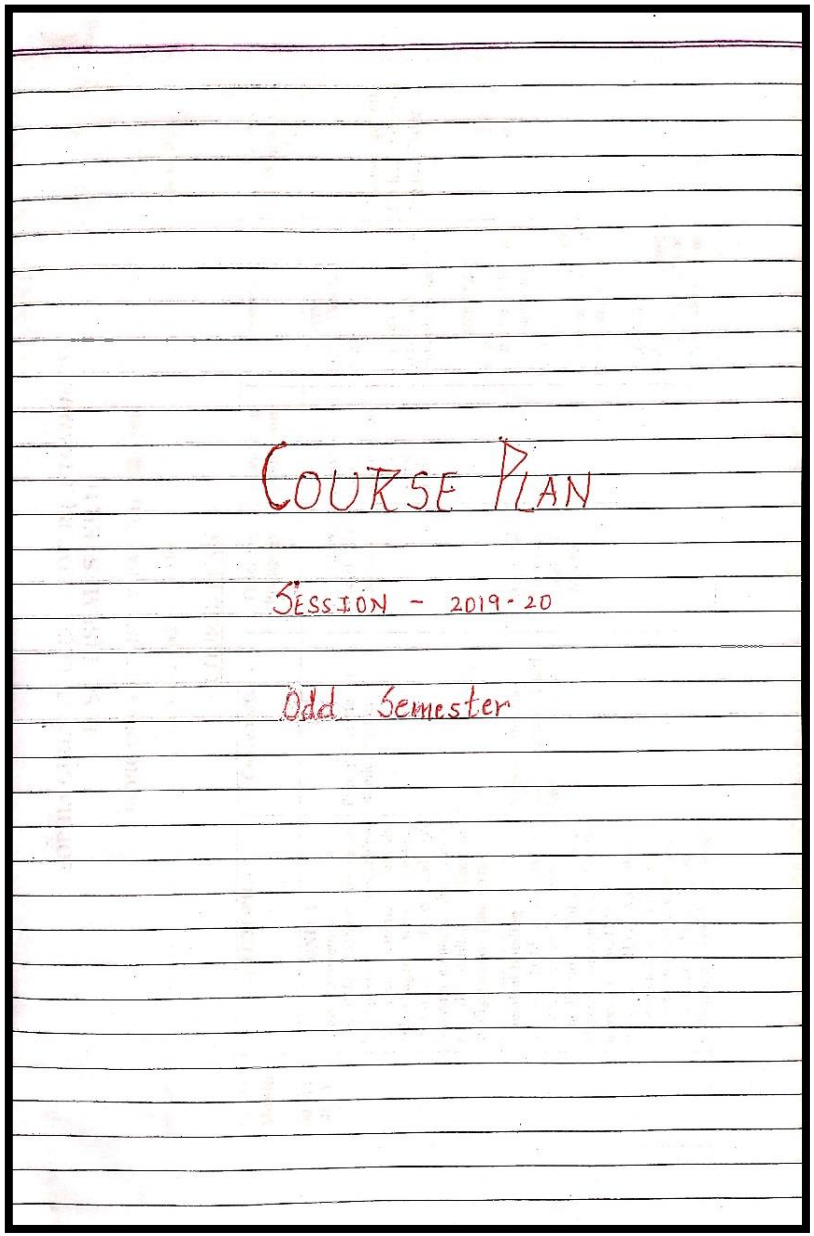
SOPHIA GIRLS' COLLEGE(AUTONOMOUS), AJMER




COURSE PLAN
SESSION - 2019-20
Odd Semester

SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
B. Sc. I (SEMESTER I)

INORGANIC CHEMISTRY (PAPER I) (CHE-101)

Max. Marks: 75 (50 Ext; 25 Int) Min. Marks: 30(20 Ext; 10 Int) Credit: 03

COURSE PLAN

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	**UNIT I** **Atomic Structure** Idea of de-Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of φ and φ^2, quantum numbers, shapes of s, p, d orbitals. Electronic configurations of the atoms	Principles related to atomic structure	PPT, Chart, Visual 3- D Models	Interpret atomic structure and nature of covalent bonds.	*Knowledge Based* -Define Dipole Moment. -Illustrate hybridization in ammonia molecule. *Understanding Based* -Compare VB and MO approach of bonding. -Classify different compounds of p-block elements *Higher Order Thinking Skills Based* -Explain function of s- block elements in	Knowledge--60 Understanding-30 Higher Order-10
	Chemical Bonding Valence bond theory and its limitations, various types of hybridization. Valence shell electron pair repulsion (VSEPR) theory to NH_3, H_3O^+, SF_4, ClF_3, ICl^-_2, and H_2O. MO theory, homonuclear and heteronuclear diatomic molecules, Comparison of VB and MO approaches, multicentre bonding, dipole	Nature of Bonding according to VBT and MOT	Match the following, Visual 3- D Models			

	moment				biosystems. -Explain electronegativity and its periodic variation.	
AUGUST	**UNIT II** **Periodic Properties** Atomic and ionic radii, ionization enthalpy, electron gain enthalpy and electronegativity	Periodic trends of various properties	Diagrams, Quiz,	Compare various periodic properties and discuss ionic solids.		
	Ionic Solids Ionic structures, radius ratio and coordination number, lattice defects, semiconductors, lattice energy and Born-Haber cycle, solvation energy and solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule. Metallic bond- free electron, valence bond and band theories	Ionic structure of solids	Diagrams, Models, PPT			
SEPTEMBER-OCTOBER	**UNIT III** **s-Block Elements** Comparative study, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems.	Properties and functions of s- block elements	PPT, Chart, Diagrams.	Summarize properties of s- and p- block		
	p-Block Elements Comparative study (including diagonal relationship) of groups 13-17 elements, compounds like hydrides, oxides and halides of	Comparative study of p-block elements and compounds	PPT, Quiz, Diagrams.			

	groups 13-16, hydrides of boron- diborane and higher boranes, borazine, borohydrides.				

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B.Sc. II (SEMESTER III)

PRACTICALS (CHE-303)

Max. Marks: 50(40Ext; 10 Int) Min Marks: 20(16 Ext;4 Int) Credit: 02

COURSE PLAN

SEM Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	**Inorganic Chemistry** • Calibration of fractional weights, pipettes and burettes. -Preparation of standard solutions. • Dilution 0.1 M to 0.001 M solutions.	Preparation of solutions	Exercises with Use of different Apparatus and glasswares	Understand the practical applications of various aspects of chemistry	*Knowledge Based* Practical File Work *Understanding Based* -To determine acetic acid in commercial vinegar using NaOH. -To determine alkali content in antacid tablet. *Higher Order Thinking Skills Based* Viva Voce	Knowledge--30 Understanding-50 Higher Order-20
AUGUST	**Volumetric Analysis** • Determination of acetic acid in commercial vinegar using NaOH. • Determination of alkali content-antacid tablet using HCI. • Estimation of calcium content in chalk as calcium	Volumetric Analysis	Demonstration of the exercise			

	oxalate by potassium permanganate. • Estimation of hardness of water by EDTA. • Estimation of ferrous and ferric dichromate method. • Estimation of copper using thiosulphate					
SEPTEMBER-OCTOBER	**Gravimetric Analysis.** • Analysis of Cu as CuSCN • Ni as Ni-dimethylglyoxime.	Gravimetric Analysis.	Exercises with Use of different Apparatus like oven, decicator, suction pump and crucible.			

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
M.SC CHEMISTRY (FINAL)
SEMESTER III (M.Sc. F)

ENVIRONMENTAL AND GREEN CHEMISTRY (CHEM-303)

MAX MARKS: 100 (70EXT; 30 INT) **MIN. MARKS: 40 (28 EXT; 12 INT)**

COURSE PLAN

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	**Unit-I** Introduction , need of green chemistry, Basic principles, concept of atom economy, designing green synthesis using these principles.	Introduction, Principle and concept of green chemistry	Charts, PPT	Elaborate the principle and concept of green chemistry.	*Knowledge Based* -Define Green Chemistry? -What is atom economy? *Understanding Based* -List the water quality parameters. Indicate the permissible limit of chloride and fluoride -Distuinguish between Chemical	Knowledge-25 Understanding-45 Higher Order-30
AUGUST	**Unit-II** Different approaches to green synthesis : Use of green reagents, green solvents, Synthetic organic transformations under microwave, heterocyclic	Application of greener alternative approaches	Diagrams, Quiz	Illustrate application of greener alternative approaches		

	synthesis.				Oxygen Demand and Biological Oxygen Demand	
SEPTEMBER-OCTOBER	**Unit-III** Sampling procedures and monitoring of water pollutants, determination of T.D.S. conductivity , acidity, alkalinity, hardness, chloride, FRC, sulphate, fluoride, phosphate, phenols, pesticides analysis, determination of DO, BOD, COD Water quality parameters, standards and laws.	Analysis of pollution	PPT, Models	Analyse the various aspects of pollution	*Higher Order Thinking Skills Based* - Write down the principles of Green Chemistry - Estimate the method of fluoride content in water.	

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
M.SC CHEMISTRY (PREVIOUS)
Practical (CHEM-305)

AUGUST	**ORGANIC CHEMISTRY** **Qualitative Analysis** Separation and identification of the compound of mixture of three organic compounds (three solids and/or two solids and liquid) by Water, $NaHCO_3$, NaOH. Prepare derivatives, wherever possible.	Detection of organic compounds in ternary mixture	Instruments like pH meter, Glassware, Diagrams	Understand the practical applications of various aspects of chemistry	*Knowledge Based* -- Practical File Work *Understanding Based* -To separate and identify the components of the given organic ternary mixture. *Higher Order Thinking Skills Based* -Viva- Voce	Knowledge--20 Understanding-40 Higher Order-40

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