

## Lesson Plan

Name of Assistant/Associate Professor: Arun Soni

Class and section: B.Sc II N.M & Med. Sem 4<sup>th</sup> ( PHYSICAL CHEMISTRY )

Chemistry Lesson Plan: Week (From FEB 2023 to May 2023)

<b>Chapter 1: Thermodynamics II</b>	<b>Dates</b>
○ 1.1 Introduction –Need for second Law of thermodynamics and Statement	Feb , Week 3 <sup>rd</sup>
○ 1.2 Carnot Cycle And its efficiency ○ 1.3 Carnot Theorem	Feb , Week 3 <sup>rd</sup>
○ 1.4 Thermodynamics scale of temperature ○ 1.5 Entropy	Feb , Week 4 <sup>th</sup>
○ 1.6 Entropy Change in Reversible Processes ○ 1.7 Entropy Change in irreversible Processes	Feb , Week 4 <sup>th</sup>
○ 1.8 Clausius inequality ○ 1.9 Entropy change of universe	March, Week 1 <sup>st</sup>
○ 1.10 Entropy change for ideal gas with change in P,V & T ○ Entropy Change during Physical changes	March, Week 1 <sup>st</sup>
○ 1.11 Entropy Change on mixing of ideal gas ○ 1.12 Physical Significance of Entropy ○ 1.13 Measure of Disorder	March , Week 2 <sup>nd</sup>
<b>Chapter 2:Electrchemistry</b>	
○ 2.1 What is Electrochemical cell or Galvanic cell ○ 2.2 What is Electrolytic Cell	March , Week 2 <sup>nd</sup>
○ 2.3 Representation of Electrochemical Cell ○ 2.4 Electrode Potential	March, Week 3 <sup>rd</sup>
○ 2.5 EMF of the Cell And its Measurement ○ 2.6 Standard cell	March, Week 3 <sup>rd</sup>
○ 2.7 Reversible and Irreversible Cell ○ 2.8 Reversible electrodes	March, Week 4 <sup>th</sup>
○ 2.9 Relationship between Chemical and Electrical Energy ○ 2.10 Calculation of Thermodynamics Quantity of the Cell reaction	April, Week 1 <sup>st</sup>
○ 2.11 Standard Hydrogen Electrode and Measurement of Electrode Potential ○ 2.12 Other Reference Electrode and Measurement of Electrode Potential	April, Week 1 <sup>st</sup>
○ Assignment-I	April, Week 2 <sup>nd</sup>
○ 2.13 Electrochemical Series ○ 2.14 Application of Electrochemical Series	April, Week 2 <sup>nd</sup>
○ 2.15 Activity and Activity coefficient of the electrolyte ○ 2.16 Standard State	April, Week 3 <sup>rd</sup>
○ 2.17 Nernst Equation for EMF of Cell ○ 2.18 Nernst Equation for Electrode Potential	April, Week 3 <sup>rd</sup>
○ 2.19 Calculation of Equilibrium Constant of Cell reaction	April, Week 4 <sup>th</sup>

○ 2.20 Polarization	
○ 2.21 Decomposition Voltage/Potential Deposition	
○ 2.22 Discharge of Potential	
○ 2.23 Overvoltage or Over Potential	April Week 4 <sup>th</sup>
○ 2.24 Hydrogen Overvoltage	
○ 2.25 Anodic Overvoltage and Oxygen Overvoltage	May, Week 1 <sup>st</sup>
○ 2.26 Application of Overvoltage	
○ Test	May, Week 1 <sup>st</sup>
○ 2.27 Concentration Cell	May, Week 2 <sup>nd</sup>
○ 2.28 Types of Concentration Cell	
○ Assignment-II	May, Week 2 <sup>nd</sup>
○ 2.29 EMF of Concentration Cell	May, Week 3 <sup>rd</sup>
○ 2.30 Review of Various Types of Electrochemical Cells	May, Week 3 <sup>rd</sup>
○ 2.31 Liquid Junction Potential	May, Week 3 <sup>rd</sup>
○ 2.32 Determination of Activities and Activity Coefficient from EMF Measurements	May, Week 3 <sup>rd</sup>
○ 2.33 Application of EMF Measurement	

## LESSON PLAN

Name of Assistant/Associate Professor: SEEMA KASHYAP

Class and section: B.Sc II Med. & Non med. Sem 4<sup>th</sup> (INORGANIC CHEMISTRY)

Chemistry Lesson Plan: 15 Week (From FEB 2023 to May 2023)

Chapter 1: Chemistry of Lanthanides	Dates
<ul style="list-style-type: none"><li>1.1 Introduction</li><li>1.2 Electronic structure</li><li>1.3 Physical properties of lanthanides</li></ul>	Feb , Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>1.4 oxidation states</li><li>1.5 magnetic properties</li></ul>	Feb , Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>1.6 ionic radii and lanthanide contraction</li><li>1.7 complex formation</li></ul>	Feb , Week 4 <sup>th</sup>
<ul style="list-style-type: none"><li>1.8 occurrence and isolation</li><li>1.9 lanthanide compounds</li></ul>	Feb , Week 4 <sup>th</sup>
<b>Chapter 2: Chemistry of Actinides</b>	March, Week 1 <sup>st</sup>
<ul style="list-style-type: none"><li>2.1 General features and chemistry of actinides</li><li>2.2 chemistry of separation of Np, Pu and Am from U</li></ul>	March, Week 1 <sup>st</sup>
<ul style="list-style-type: none"><li>2.3 Comparison of properties of lanthanides and actinides and with transition elements</li></ul>	March , Week 2 <sup>nd</sup>
<ul style="list-style-type: none"><li>problems from chapter 1 &amp; 2</li></ul>	
<ul style="list-style-type: none"><li>test of chapter 2</li></ul>	March , Week 2 <sup>nd</sup>
<b>Chapter 3: Theory of qualitative and quantitative inorganic analysis-1</b>	
<ul style="list-style-type: none"><li>3.1 Introduction</li><li>3.2 Basic Principles of Inorganic qualitative analysis</li></ul>	March, Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>3.3 Chemistry of analysis of various acidic radicals</li><li>3.4 chemistry of identification of acidic radicals in typical combinations</li></ul>	March, Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>3.5 chemistry of interference of acid radicals including their removal in the analysis of basic radicals</li></ul>	March, Week 4 <sup>th</sup>
<ul style="list-style-type: none"><li>problems of chapter 3</li></ul>	April, Week 1 <sup>st</sup>
<b>Chapter 4: Theory of qualitative and quantitative inorganic analysis - II</b>	
<ul style="list-style-type: none"><li>3.1 systematic analysis of basic radicals</li><li>3.2 chemistry of various reaction</li></ul>	April, Week 1 <sup>st</sup>
<ul style="list-style-type: none"><li>3.3 identification of cations of group I</li><li>3.4 identification of cations of group II A and separation of group II B</li></ul>	April, Week 2 <sup>nd</sup>
<ul style="list-style-type: none"><li>Assignment I</li></ul>	April, Week 2 <sup>nd</sup>
<ul style="list-style-type: none"><li>Test</li></ul>	April, Week 3 <sup>rd</sup>

<ul style="list-style-type: none"> <li>• 3.5 identification and separation of group III</li> </ul>	April, Week 3 <sup>rd</sup>
<ul style="list-style-type: none"> <li>• 3.6 identification and separation of group IV</li> </ul>	April, Week 4 <sup>th</sup>
<ul style="list-style-type: none"> <li>• 3.7 Schematic flow chart of group V cations</li> <li>• 3.8 test of Ni<sup>2+</sup> in the presence of Co<sup>2+</sup></li> </ul>	
<ul style="list-style-type: none"> <li>• 3.9 gravimetry of gravimetric analysis</li> </ul>	April Week 4 <sup>th</sup>
<ul style="list-style-type: none"> <li>• 3.10 theory of precipitation</li> <li>• 3.11 factors affecting solubility of precipitates</li> </ul>	May, Week 1 <sup>st</sup>
<ul style="list-style-type: none"> <li>• 3.12 particle size of the precipitates</li> </ul>	May, Week 1 <sup>st</sup>
<ul style="list-style-type: none"> <li>• 3.13 formation of precipitates</li> <li>• 3.14 desirable properties and contamination of precipitates</li> </ul>	May , Week 2 <sup>nd</sup>
<ul style="list-style-type: none"> <li>• 3.15 treatment of the precipitates</li> <li>• 3.16 fractional precipitation</li> </ul>	May, Week 2 <sup>nd</sup>
<ul style="list-style-type: none"> <li>• Problems from Chapter 3</li> </ul>	May, Week 3 <sup>rd</sup>
Test	May , Week 3 <sup>rd</sup>

## LESSON PLAN

Name of Assistant/Associate Professor: SEEMA KASHYAP

Class and section: B.Sc II Med. & Non med. Sem 4<sup>th</sup> (ORGANIC CHEMISRY)

Chemistry Lesson Plan:Week (From Feb 2023 to May 2023)

Chapter 1: Infrared Absorption Spectroscopy	Dates
<ul style="list-style-type: none"><li>1.1 Molecular Vibration</li><li>1.2 Hooke's Law</li><li>1.3 Selection Rule</li></ul>	Feb , Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>1.4 Intensity and Position of IR Bands</li><li>1.5 Measurement of IR Spectrum</li></ul>	Feb , Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>1.6 Fingerprint Reason</li><li>1.7 Characteristics Absorption of Various Functional Groups</li></ul>	Feb , Week 4 <sup>th</sup>
<ul style="list-style-type: none"><li>1.8 Interpretation of IR Spectra</li><li>1.9 Application of IR Spectroscopy</li></ul>	Feb , Week 4 <sup>th</sup>
<b>Chapter 2: Amines</b>	March, Week 1 <sup>st</sup>
<ul style="list-style-type: none"><li>2.1 Structure of Amines</li><li>2.2 Nomenclature of Amines</li></ul>	March, Week 1 <sup>st</sup>
<ul style="list-style-type: none"><li>2.3 Separation of Primary, Secondary and Tertiary Amines</li><li>2.4 Physical Properties</li></ul>	March , Week 2 <sup>nd</sup>
<ul style="list-style-type: none"><li>2.5 Basic Character</li><li>2.6 Factor effecting the Basic Character</li></ul>	March , Week 2 <sup>nd</sup>
<ul style="list-style-type: none"><li>2.7 Preparation of Alkyl Amine</li><li>2.8 Preparation of Aryl Amine</li></ul>	March, Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>2.9 Gabriel Phthalimide Reaction</li><li>2.10 Hofmann Bromamide Reaction</li></ul>	March, Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>2.11 Electrophilic Substitution of Aryl Amine</li><li>2.12 Reaction of Amine with Nitrous Acid</li></ul>	March, Week 4 <sup>th</sup>
<ul style="list-style-type: none"><li>Problems from Chapter 1 and 2</li></ul>	March, Week 4 <sup>th</sup>
<ul style="list-style-type: none"><li>Test of Chapter 1 (Infrared Absorption Spectroscopy)</li></ul>	April, Week 1 <sup>st</sup>
<b>Chapter 3: Diazonium Salts</b>	
<ul style="list-style-type: none"><li>3.1 Mechanism of Diazotization</li><li>3.2 Structure of Benzene Diazonium Chloride</li></ul>	April, Week 1 <sup>st</sup>
<ul style="list-style-type: none"><li>3.3 Various Reaction of Diazonium Salts</li><li>3.4 Reduction of Diazonium Salts to Hydrazine</li></ul>	April, Week 2 <sup>nd</sup>
<ul style="list-style-type: none"><li>3.5 Coupling Reactions</li><li>3.6 Synthesis Application of Diazonium Salts</li></ul>	April, Week 2 <sup>nd</sup>
<b>Chapter 4: Nitro Compounds</b>	April, Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>4.1 Preparation of Nitro Alkane</li><li>4.2 Preparation of Nitro Arenes</li></ul>	
<ul style="list-style-type: none"><li>4.3 Chemical Reactions</li><li>4.4 Mechanism of Electrophilic Substitution Reactions</li></ul>	April, Week 3 <sup>rd</sup>
<ul style="list-style-type: none"><li>4.5 Reduction in Acidic Neutral and Alkaline Medium</li></ul>	April, Week 4 <sup>th</sup>

○ 4.6 Problem of Nitro Compounds	
<b>Chapter 5: Aldehyde and Ketone</b>	
○ 5.1 Nomenclature of Carbonyl Group ○ 5.2 Structure of Carbonyl Group	April Week 4 <sup>th</sup>
○ 5.3 Synthesis of Aldehyde and Ketone ○ 5.4 Synthesis of Aldehyde from Acid Chloride	May, Week 1 <sup>st</sup>
○ 5.5 Advantage of Control Oxidation of Alcohol ○ 5.6 Physical Property ○ 5.7 Comparison of Reactivity of Aldehyde and Ketone	May, Week 1 <sup>st</sup>
○ 5.8 Mechanism of Nucleophilic Addition of Carbonyl Group ○ 5.9 Mechanism of Aldol Reaction ○ 5.10 Mechanism of Perkin Reaction ○ 5.11 Mechanism of Knoevenagel Reaction	May, Week 2 <sup>nd</sup>
○ 5.12 Condensation with Ammonia and its Derivatives ○ 5.13 Wittig Reaction ○ 5.14 Mannich Reaction	May, Week 2 <sup>nd</sup>
○ 5.15 Oxidation of Aldehyde ○ 5.16 Baeyer Villiger Oxidation ○ 5.17 Cannizzaro Reaction	May, Week 3 <sup>rd</sup>
○ 5.18 Clemmensen Reduction ○ 5.19 Wolf kishner Reduction ○ 5.20 LiAlH <sub>4</sub> and NaBH <sub>4</sub> Reduction	May, Week 3 <sup>rd</sup>
○ Problem of Aldehyde & ketone	May, Week 3 <sup>rd</sup>
○ Revision and Practical	May, Week 3 <sup>rd</sup>

