

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: 1st & 7th

Subject: **Group Theory and Wave Mechanics (CH-411)**

Session: Odd 2016–2017

Theory/Sessional

Branch/Course: **M.Sc. (IC) and Int. M.Sc. (Chemistry)**

Name of the Faculty Member: **Dr. Aruna Kumar Barick**

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	I	Symmetry Elements and Symmetry Operations, Matrix Representation of Symmetry Operation, Classes of Operations	
2	I	Point Groups (C_n , C_{nv} , C_{nh} , S_n , D_n , D_{nd} , and D_{nh})	
3	I	Point Groups (T_d , O_h , $D_{\infty h}$, $C_{\infty v}$, and $D_{\infty h}$)	
4	I	Properties of Point Groups,	
5	I	Irreducible and Reducible Representation, Bases of Representation	
6	I	Character of a Representation, Reduction Formula	
7	I	The Great Orthogonality Theorem (Without Proof) and Its Explanation	
8	I	Construction of Character Tables for C_{2v} and C_{3v}	
9	I	Construction of Character Tables for T (Cubic), C_4 (Cyclic) and D_{∞} Groups	
10	I	Projection Operator and Direct Product	
11	II	Postulates of Quantum Mechanics, Quantum Mechanical Operators	
12	II	Application of Schrodinger Wave Equation to Particle in a Box	
13	II	Harmonic Oscillator	
14	II	Rigid Rotator	
15	II	Hydrogen Atom, Transformation of Co-ordinates	
16	II	Separations of Variables	
17	II	ϕ , θ and R Equations, Spherical Harmonics	
18	II	Shapes of s , p and d Orbital	
19	II	Probability Density in 1s Orbital, Physical Interpretation of Hydrogen Orbitals	
20	II	Radial Distribution Function and Curves	
21	III	Definition	
22	III	Generalized Angular Momentum	
23	III	Eigen Functions and Eigen Values of Angular Momentum	
24	III	Operator using Ladder Operators	
25	III	Addition of Angular Moments	

26	III	Mutual Interaction of Electron Orbitals and Resultant Vectors	
27	III	Russel–Saunder’s Coupling	
28	III	j–j Coupling	
29	III	Ground State Term Symbols and Hund’s Rule	
30	III	Micro States and Derivation of Russel–Saunder’s Term for P ² , d ² and pd Configuration	
31	IV	Variation Theorem and its Application to Hydrogen atom in Derivation of its Ground State Energy	
32	IV	Perturbation Theory (First Order and Non-degenerate)	
33	IV	Secular Equations	
34	IV	Linear Combination of Atomic Orbitals (LCAO) Approximation (Molecular Orbital Theory)	
35	IV	Application to Hydrogen Molecule Ion	
36	IV	Huckel Theory of Conjugated Systems	
37	IV	Bond Order and Charge Density Calculations	
38	IV	Applications to Ethylene, Butadiene	
39	IV	Applications to Cyclopropenyl Radical, Cyclobutadiene, etc.	
40	IV	Spin and Anti-symmetric Nature of Wave Function (Pauli’s Exclusion Principle)	

Signature of Faculty Member:

Date:

Counter Signature of H.O.D.

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VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: 1st & 7th

Subject: Structure and Reactivity (CH-413)

Session: Odd 2016–2017

Theory/Sessional

Branch/Course: M.Sc. (IC) and Int. M.Sc. (Chemistry)

Name of the Faculty Member: **Dr. Sukalyan Dash**

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	I	Delocalized Chemical Bonding, Conjugation	
2	I	Cross Conjugation	
3	I	Resonance	
4	I	Hyperconjugation, Bonding in Fullerenes, Tautomerism.	
5	I	Aromaticity in Benzenoid and Non-benzenoid Compounds, Alternant and Non-alternant Hydrocarbons	
6	I	Huckel's Rule, Energy Levels of π -molecular Orbitals of Simple Systems, Annulenes, Anti-aromaticity, Homo-aromaticity	
7	I	Bonds Weaker than Covalent (Addition compounds)	
8	I	Crown Ether Complexes and Cryptands	
9	I	Inclusion Compounds, Cyclodextrins	
10	I	Catenanes and Rotaxanes	
11	II	Types of Mechanisms, Types of Reactions	
12	II	Thermodynamic and Kinetic Requirements	
13	II	Kinetic and Thermodynamic Control	
14	II	Hammond's Postulate, Curtin-Hammett Principle	
15	II	Potential Energy Diagrams, Transition States and Intermediates	
16	II	Methods of Determining Mechanisms	
17	II	Methods of Determining Mechanisms	
18	II	Hard and Soft Acids and Bases	
19	II	Hammett Equation and Linear Free Energy Relationship	
20	II	Substituent and Reaction Constants. Taft Equation	
21	III	Non-classical Carbocations	
22	III	Generation and Structure of Free Radicals	
23	III	Generation and Structure of Carbenes	
24	III	Generation and Structure of Nitrenes	
25	III	Generation and Structure of Arynes	
26	III	General Discussion on Isotope Effect	

27	III	General Discussion on Isotope Effect	
28	III	Stereoselective, Regioselective Reactions	
29	III	Stereospecific and Regiospecific Reactions	
30	III	Stereospecific and Regiospecific Reactions	
31	IV	S_N^2 , S_N^1 Mechanisms	
32	IV	Mixed S_N^1 and S_N^2 Mechanism	
33	IV	SET Mechanisms. The Neighboring Group Mechanism	
34	IV	Neighboring Group Participations by Sigma and Pi Bonds	
35	IV	Classical and Non-classical Carbocations, Phenonium Ions, Norbornyl System	
36	IV	Nucleophilic Substitution at Allylic, Carbon	
37	IV	Nucleophilic Substitution at Aliphatic Trigonal and Vinylic Carbon	
38	IV	Effects of Substrate Structure, Attacking Nucleophile	
39	IV	Effects of Leaving Group and Reaction Medium	
40	IV	Phase Transfer Catalysis, Ambident Nucleophile, Regioselectivity	

Signature of Faculty Member:

Date:

Counter Signature of H.O.D.

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

Semester -7th &1st M.Sc
M.Sc

LESSON PLAN

Subject: Thermodynamics & Chemical dynamics (CH-414)

Session: 2016

Theory

Branch/Course: Integrated M.Sc & M.Sc

Name of the Faculty Member: **Dr Trinath Biswal**

Period	Module /Number	Topic to be covered
1	I	Laws of Thermodynamics
2	I	Free Energy
3	I	Partial Molar Properties & Chemical Potential
4	I	Third Law of Thermodynamics & Determination of Entropy
5	I	Entropy & Probability
6	I	Boltzmann-Planck equation
7	I	Partial free energy ,molar volume ,molar heat content
8	I	Problems
9	I	Fugacity & its Determination
10	I	Determination of fugacity by Graphical Method
11	I	Determination of fugacity by Approximate & General Method
12	II	Probability Distribution, Ensemble averaging & its types
13	II	Postulates of Ensemble averaging , Canonical , Grand Canonical & Microcanonical
14	II	Corresponding Distribution Law
15	II	Translational & Rotational Partition Function
16	II	Vibrational Partition Function, Electronic Partition Function
17	II	Calculation of thermodynamic properties of Partition Function
18	II	Applications of Partition Function
19	II	Behavior of solids , Fermi- Dirac Statistics
20	II	Chemical equilibria & equilibrium constant in terms of Partition function
21	II	Bose-Einstein Statistics , Distribution Law & application to He
22	II	Phosphate group transfer & ATP , Biological oxidation & reduction Reaction
23	III	Interionic attraction Theory & Debye- Huckel Treatment
24	III	Onsager Limiting law its Verification & Modification
25	III	Activity & Activity coefficient
26	III	Debye- Huckel – Bronsted Equation , Salt effect
27	III	Primary salt effect & secondary salt effect
28	III	Determination of activity coefficient by solubility Method , Ion Association
29	III	Determination of thermodynamic dissociation constant of weak electrolytes by Shedlovsky Method & EMF Method
30	III	Amino acids , Hydrogen ion concentration
31	III	Ampholytes Isoelectric points
32	IV	Introduction , collision theory of Reaction Rate
33	IV	Theory of Absolute Reaction rate of both unimolecular & Bimolecular Reaction
34	IV	Lindeman Mechanism
35	IV	Arrhenius theory & Activated complex
36	IV	Reaction between ions
37	IV	Steady-State Kinetics & its Problems , Examples
38	IV	Dynamic chain reactions of Hydrogen & Bromine
39	IV	Pyrolysis of Acetaldehyde , Ethane
40	IV	Fast reaction & its study by Relaxation Method
41	IV	Flash photolysis & NMR Technique

Signature of Faculty member:
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VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

Semester - 1st & 7th

LESSON PLAN

Subject: Polymer Chemistry (CH-415)

Session: 2016

Theory/ Sessional

Branch/Course: M.Sc & Integrated M.Sc

Name of the Faculty Member: **Dr Trinath Biswal**

Period	Module /Number	Topic to be covered	
1	I	Introduction, classification of polymer, DP, Tacticity,	
2	I	Functionality, crystallinity , Degree of crystallinity	
3	I	Glass Transition temperature & its application	
4	I	Inorganic polymer & Elemento -Organic polymer ,Crystallisability	
5	I	Chain-growth polymerization ,its mechanism , Kinetics of Chain –growth polymerization	
6	I	Polyaddition polymerization , Step-growth polymerization ,its mechanism , Kinetics of step – growth polymerization	
7	I	Distinction between Step-growth & Chain-growth polymerization , Molecular weight control & Molecular weight distribution of linear polymer	
8	I	Polyfunctional step polymerization, Newer type of step polymerization	
9	I	Radical chain polymerization ,Molecular weight , chain transfer, Inhabitation & Retardation	
10	I	Determination of absolute rate constant, Auto acceleration	
11	II	Emulsion Polymerization ,Qualitative aspect , Mechanism	
12	II	CMC , Salient features, Application, Advantages	
13	II	Ionic chain polymerization ,comparison of radical & ionic chain polymerization	
14	II	Kinetics of cationic chain polymerization ,Carother equation	
15	II	Kinetics of anionic chain polymerization ,features of cationic & anionic chain polymerization	
16	II	Cationic polymerization & Anionic polymerization of carbon-carbon double bond	
17	II	Block copolymer ,types synthesis ,properties & Application	
18	III	Chain copolymerization ,classification properties , application	
19	III	Radical chain co-polymerization & its kinetic study	
20	III	Ionic chain co-polymerization & its kinetic study	
21	III	Ring opening polymerization , Examples & Mechanism	
22	III	General characteristic Ring opening polymerization of cyclic ethers & cyclic amides	

23	III	Stereoisomerism ,types of stereoisomerism in polymers	
24	III	.Properties of Stereo- regular polymers	
25	III	Forces of Stereo -regulation in alkene polymerization	
26	III	Ziegler-Natta polymerization ,Types ,Mechanism & kinetic study	
27	III	Crystalline melting point, Glass transition temperature	
28	III	.Relationship of T_g with molecular weight , plasticizer ,n copolymer	
29	III	Properties involving Large deformation	
30	IV	Properties involving small deformation	
31	IV	Ideal ,Azeotropic , Alternating Copolymerization	
32	IV	Property requirement & Utilization of polymers	
33	IV	Fracture & Deformation of polymer	
34	IV	,Fracture Mechanism , Types of Fracture	
35	IV	Crack growth & its Mechanism	
36	IV	Cyclic deformation &its Molecular aspects	
37	IV	Healing of polymer. Adhesives	
38	IV	Conducting polymer , characteristics & Examples	
39	IV	Different types of Molecular weight	
40	IV	Molecular weight Determination	
41	IV	Molecular weight Determination & Short questions	

Signature of Faculty member:

Date:

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VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

Semester: 2nd, 8th

LESSON PLAN

Subject: Stereochemistry (CH-422)

Session: Even 2016–2017

Theory/Sessional

Branch/Course: M.Sc and

Name of the Faculty Member: Dr. Ramakrishna D.S.

Int. MSc

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	I	Chirality, Fischer projection and R and S notations,	
2	I	Threo and erythro nomenclature, E and Z nomenclature,	
3	I	Optical isomerism in biphenyls	
4	I	Allenes,	
5	I	Concept of Prostereoisomerism	
6	I	Assymmetric synthesis	
7	I	Assymmetric synthesis (enzymatic)	
8	I	catalytic nexus	
9	I	Conformation of a few acyclic molecules (5memb)	
10	I	Conformation of a few acyclic molecules (6memb)	
11	II	Conformation of a few acyclic molecules (hetero)	
12	II	Conformation of cyclic systems having one sp ² carbon atoms	
13	II	two sp ² carbon atoms	
14	II	Dynamic stereochemistry	
15	II	Conformation and reactivity, Selection of substrates	
16	II	Quantitative correlation between conformation and reactivity	
17	II	Weinstein-Elieil equations and Curtin-Hammett principles	
18	II	Conformational effects on stability and reactivity in acyclic compounds	
19	II	Ionic elimination	
20	II	Intramolecular rearrangements	
21	II	Neighbouring group participation	
22	II	cyclic systems	
23	II	Nucleophilic substitution reaction at ring carbon	
24	II	Formation and Cleavage of epoxide rings	
25	II	Addition reactions to double bonds	
26	II	Elimination reactions	
27	III	Molecular dissymmetry	
28	III	chiroptical properties	
29	III	linearly and circularly polarised lights	
30	III	circular birefringence and circular dichroism	
31	IV	ORD, Plane curves, Cotton effect	
32	IV	Rotatory Dispersion of ketones	
33	IV	the Axial Haloketone rule	
34	IV	the Octane rule	

35	IV	Helicity rule	
36	IV	Lowe's rule	
37	IV	Emperical rule	
38	IV	Benzene chromophore.	
39	IV	Problems	
40	IV	Overall view	

Signature of Faculty:

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VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: 2nd & 8th

Session: **Even 2016–2017**

Branch/Course: **M.Sc. (IC) and Int. M.Sc. (Chemistry)**

Subject: **Spectroscopy-I (CH-423)**

Theory/Sessional

Name of the Faculty Member: **Dr. Aruna Kumar Barick**

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	I	Atomic Spectroscopy: Introduction	
2	I	Electromagnetic Spectrum	
3	I	General Discussion on Various Molecular Excitation Processes	
4	I	Spectra of Hydrogen and Hydrogen Like Atoms	
5	I	Alkali Metals Spectra	
6	I	L-S Coupling, Term Symbols,	
7	I	Space Quantization	
8	I	Zeeman Effect and Stark Effect	
9	I	Paschen-Bach Effect	
10	I	Problem Solve	
11	II	Rotational and Vibrational Spectroscopy: Introduction	
12	II	Rotation of Molecules and Classification of Molecules	
13	II	Molecular Spectra of Diatomic Gases	
14	II	Rotational Spectra of Diatomic Molecules	

15	II	Rotational Spectra of Polyatomic Molecules	
16	II	Vibrational Spectra of Diatomic Molecules	
17	II	Intensity of Spectral Lines	
18	II	Vibrational-Rotational Spectra	
19	II	P, Q, and R Branches	
20	II	Problem Solve	
21	III	<i>Raman Spectroscopy</i> : Introduction	
22	III	Quantum Theory of Raman Effect	
23	III	Classical Theory of Raman Effect	
24	III	Pure Rotational Raman Spectra	
25	III	Vibrational Raman Spectra	
26	III	Polarization of Light and the Raman Effect	
27	III	Rotational-Vibrational Raman Spectra	
28	III	Comparison with IR spectra	
29	III	Structure Determination from Raman and IR Spectra	
30	III	Problem Solve	
31	IV	<i>Photoelectron Spectroscopy</i> : Basic Principles	
32	IV	Photoelectric effect, Ionization Process, Koopman's Theorem	
33	IV	Photoelectron Spectra of Simple Molecules	
34	IV	ESCA, Chemical Information from ESCA	
35	IV	Auger Electron Spectroscopy – Basic Idea	
36	IV	<i>Mössbauer Spectroscopy</i> : Introduction	
37	IV	Principles of Mossbauer Spectroscopy	
38	IV	Experimental Methods, Theoretical Aspects	
39	IV	Quadrupole Splitting, Magnetic Hyperfine Interaction	
40	IV	Problem Solve	

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VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA**LESSON PLAN**Semester: 2nd & 8thSubject: **Organic Reaction Mechanism (CH-424)**Session: **Even 2016–2017****Theory/Sessional**Branch/Course: **M.Sc. (IC) and Int. M.Sc. (Chemistry)**Name of the Faculty Member: **Dr. Sukalyan Dash**

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	I	S _E ¹ , S _E ² and S _E ⁱ Mechanisms	
2	I	Effect of Substrate, Leaving Group and Solvent	
3	I	Reactions Hydrogen Exchange, Migration of Double Bonds, Keto-Enol Tautomerism	
4	I	Halogenation, Aliphatic Diazonium Coupling, Stork-Enamine Reaction	
5	I	Structure Reactivity, Relationship in Mono-substituted Benzene	
6	I	Orientation in Benzene Ring with More than One Substituent, Vilsmeier-Haack Reaction, Pechmann Reaction	
7	I	Introduction, Mechanisms of Aromatic Nucleophilic Substitutions (S _N Ar, S _N ¹ , Aryne)	
8	I	Effect of Substrates, Leaving Groups, and Nucleophile	
9	I	Reactions: Nucleophilic Displacement in Arenodiazonium Salts by Different Nucleophiles, Chichibabin Reaction	
10	I	Reactions: Nucleophilic Displacement in Arenodiazonium Salts by Different Nucleophiles, Chichibabin Reaction	
11	II	Electrophilic Addition	
12	II	Nucleophilic Addition	
13	II	Free Radical Addition	
14	II	Orientation and Reactivity, Addition to Cyclopropanes	
15	II	Hydroboration, Michael Reaction, Sharpless Asymmetric Epoxidation	
16	II	Mechanism and Reactivity	
17	II	Mannich Reaction, LiAlH ₄ Reduction of Carbonyl	

		Compounds, Acids, Esters, Nitriles	
18	II	Addition of Grignard Reagents, Reformatsky Reaction, Aldol Condensation	
19	II	Knoevenagel Condensation, Perkin Reaction, Tollens Reaction	
20	II	Wittig Reaction, Prins Reaction, Benzoin Condensation	
21	III	E ² Mechanism	
22	III	E ¹ Mechanism	
23	III	E ¹ _{CB} Mechanism	
24	III	Orientation, Effect of Substrate	
25	III	Effect of Base, Leaving Group	
26	III	Effect of Medium, Orientation of Double Bond	
27	III	Saytzeff and Hoffman Rules, Pyrolytic Elimination Reaction	
28	III	Oxidative Elimination (Oxidation of Alcohol by Chromium, Moffatt Oxidation)	
29	III	Cleavage of Quaternary Ammonium Hydroxides	
30	III	Chugaev Reaction, Shapiro Reaction	
31	IV	Nature of Migration	
32	IV	Migratory Aptitude	
33	IV	Memory Effects	
34	IV	Wagner-Meerwein Rearrangement	
35	IV	Favorskii Rearrangement	
36	IV	Arndt-Eistert Synthesis	
37	IV	Neber Rearrangement	
38	IV	Hofmann Rearrangement	
39	IV	Baeyer-Villiger Rearrangement	
40	IV	Sommelet-Hauser Rearrangement	

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VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA**LESSON PLAN**Semester: 2nd and
8th

Subject: SCNC

Session: Even 2016–2017

Theory/Sessional

Branch/Course: M.Sc. (IC)
and Int. M.Sc. (Chemistry)

Name of the Faculty Member: Dr. Monalisa Mohapatra

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	I	Derivation of phase rule, Brief concept on one and two component system	
2	I	Water, Sulphur system	
3	I	Application of phase rule to three component systems of solids	
4	I	Application of phase rule to three component systems of liquids	
5	I	Kinetics of Catalytic Reactions	
6	I	Acid-base Catalysis, Enzyme Catalysis	
7	I	Heterogeneous Catalysis	
8	II	Surface tension	
9	II	Capillary action	
10	II	Adsorption, types of adsorption	
11	II	Gibbs adsorption isotherm	
12	II	Freundlich's adsorption isotherm	
13	II	Langmuir's adsorption isotherm and its limitations	
14	II	BET adsorption isotherm and its applications	
15	II	Heat of adsorption	
16	II	Estimation of surface areas of solids from solution adsorption studies	
17	II	Brief concepts on micelle	
18	II	Reversed micelle	
19	II	Microemulsions	
20	III	Polymer-definition, Types of polymer	
21	III	Number average and weight average macromolecules	
22	III	Determination of molecular weights of macromolecules	
23	III	Osmometry	
24	III	Viscometry	
25	III	Diffusion and Light scattering method	
26	III	Kinetics of polymerization	
27	III	Donnan Effect	

28	III	Stereochemistry of polymerization	
29	IV	Classification of nuclides, nuclear stability, binding energy	
30	IV	Nuclear models, Characteristics of radioactive decay	
31	IV	Decay kinetics, parent-daughter decay growth relationships	
32	IV	Detection and measurement of radioactivity, advances in the solid and liquid scintillation counting techniques	
33	IV	Methods for the determination of half life period of single and mixed radionuclides	
34	IV	Nuclear fission, nuclear fuels and nuclear reactors, nuclear fuel reprocessing	
35	IV	Fast breeder reactors, radiological safety aspects and radioactive waste managements	
36	IV	Interaction of radiation with matter, effect of ionizing/ non-ionizing radiations on water	
37	IV	Aqueous solutions and on organic compounds, radiation dosimetry	
38	IV	Preparation and separation of radioactive isotopes	
39	IV	Application of radioisotopes and radiations in various fields	
40	IV	Isotopic dilution techniques, neutron activation analysis and its applications	

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Date:

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VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: 3rd and 9th

Subject: ENVIRONMENTAL Chemistry

Session: Odd 2016–2017

Theory/Sessional

Branch/Course: M. Sc. And

Name of the Faculty Member: Prof. R. B. Panda

Int. M.SC.

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1-2	I	Air Pollutants, Air Quality Standards, Production, Fate, Effects and Control of Gaseous Pollutants	
3-4	I	Oxides of Carbon, Nitrogen and Sulphur, Organic Air Pollutants, Photochemical Reaction	
5-6	I	Photochemical Smog, Greenhouse Effect, Climate Change, Global warming, Acid Rain and Ozone Depletion.	
7-8	I	Water World, Source of Water, Water Quality, Water Pollutants (Inorganic and Organic), Sources, Fate, Effects and Controlling Measures, Chemical Speciation, Pollution by Radionuclides	
9-10	I	Biochemical Oxygen Demand, Chemical Oxygen Demand, Eutrophication, Biodegradation of Pollutants	
11-12	II	Treatment of Water for Drinking, Electro-dialysis, Ion Exchange, Reverse Osmosis	
13-14	II	Desalination Processes, Removal of Iron, Manganese, Phosphorous, Calcium and Nitrogen and Treatment of Water for Industrial Purposes	
15-16	II	Sedimentation, Coagulation, Flocculation, Filtration, Adsorption, Disinfection of Water	
17-18	II	Sewage Treatment (Physical and Chemical Methods), Health Effects of Drinking Water Treatment Technologies	
19-20	II	Impact of Detergents, Pesticides and Other Additives on Sewage Treatment	
21-22	III	Sources of Oil Pollution, Chemistry and Fate of Hydrocarbons Oil in Run Off and Ground Water	
23-24	III	Biodegradation, Effect on Aquatic Organisms and Communities	
25-26	III	Treatment and Disposal Technology	
27-28	III	Soil Pollutants (Inorganic, Organic, Pesticides, Radionuclides)	
29-30	III	Sources and Effects on Nature and Properties of Soil, Crops, Plants and Terrestrial Animals.	
31-32	IV	Nature and Sources of Hazardous Wastes, Classification, Characteristics and Constituents,	
33-34	IV	Transport and Effects, Treatment by Physical and Chemical Methods, Thermal Treatment Methods	

35-36	IV	Biodegradation of Wastes, Disposal of Hazardous Wastes. Waste Management and Industrial by Products, Natural Hazards and Management	
37-38	IV	Control of Subsurface Migration of Hazardous Waste, Biomedical Waste Management	
39-40	IV	Environmental Management and Sustainable Development	
<p>Signature of Faculty Member:</p> <p>Date: _____ Counter Signature of H.O.D. _____</p>			

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

LESSON PLAN

Semester: 4th and 10th

Session: Even 2016–2017

Branch/Course: M.Sc. (IC) and Int MSc

Subject: **Chemistry of Materials**
Theory/Sessional

Name of the Faculty Member: **Dr. Sukalyan Dash**

Period	Module/ Number	Topics to be Covered	Remarks/Sign. of Faculty Member
1	I	Glassy State, Glass Formers	
2	I	Glass Modifiers, Applications	
3	I	Ceramic Structures	
4	I	Mechanical Properties	
5	I	Clay Products. Refractories	
6	I	Characterizations, Properties and Applications	
7	I	Macroscopic Composites, Dispersion-Strengthened and Particle-Reinforced, Fibre-Reinforced Composites	
8	I	Nanocrystalline Phase, Preparation	
9	I	Procedures, Special Properties	
10	I	Applications	

11	II	Types of Ionic Conductors	
12	II	Mechanism of Ionic Conduction	
13	II		
14	II	Interstitial Jumps (Frenkel), Vacancy Mechanism	
15	II	Diffusion Superionic Conductors	
16	II	Phase Transition and Mechanism of Conduction in Superionic Conductors	
17	II	Phase Transition and Mechanism of Conduction in Superionic Conductors	
18	II	Phase Transition and Mechanism of Conduction in Superionic Conductors	
19	II	Examples and Applications of Ionic Conductors	
20	II	Examples and Applications of Ionic Conductors	
21	III	Conducting Organics, Organic Superconductors	
22	III	Magnetism in Organic Materials	
23	III	Fullerenes-Doped, Fullerenes as Superconductors	
24	III	Molecular Rectifiers	
25	III	Molecular Transistors	
26	III	Artificial Photosynthetic Devices	
27	III	Optical Storage Memory and Switches-Sensors	
28	III	Nonlinear Optical Effects, Second and Third Order, Molecular Hyperpolarisability	
29	III	Second Order Electric Susceptibility	
30	III	Materials for Second and Third Harmonic Generation	
31	IV	Introduction to <i>Thin Films and Langmuir-Blodgett Films</i>	
32	IV	Preparation Techniques: Evaporation/Sputtering	
33	IV	Chemical Processes, Sol-Gel Method	
34	IV	Growth Techniques of Langmuir-Blodgett (LB) Film	
35	IV	Photolithography	

36	IV	Properties and Application of Thin and LB Films	
37	IV	Molecular Shape, Structure and Configuration of Polymeric materials	
38	IV	Crystallinity, Stress-Strain Behaviour	
39	IV	Polymer Types and Their Applications	
40	IV	Conducting and Ferroelectric Polymers	

Signature of Faculty Member:

Date:

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