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MINUTES OF THE TWELVETH BOARD OF STUDIES MEETING

Faculty: Basic and Applied Sciences

Board: Chemistry

The Meeting of Board of Studies (BoS) was held as given below:

Name of the Body	BoS
Department	Chemistry
Meeting No.	12
Date and Time	01.12.2022 @ 10.00 a.m.
Venue	Room No: IQAC Board Room
Members Attended	The details are given in the ANNEXURE –I

AGENDA	
1.	Discussion on UG syllabi for Part III - Core Course in Second semester for 2022-23 Batch and onwards
2.	Discussion on syllabus for Part III - Inter Disciplinary Course (IDC) offered by Department of Physics in Second semester for 2022-23 Batch and onwards
3.	Discussion on syllabi for Part III - Inter Disciplinary Course (IDC) offered to Department of Microbiology, Food Science and Nutrition and Costume Design and Fashion in Second semester for 2022-23 Batch and onwards
4.	Discussion on Part I (Tamil/Hindi /French/Malayalam) offered by Language departments for 2022-23 Batch and onwards
5.	Discussion on Part II (Professional English- II) offered by English department for 2022-23 Batch and onwards
6.	Discussion on Part IV (AECC) Basic Tamil/Advanced Tamil/Human Rights and Women's rights offered by Department of Tamil and Department of Commerce with Corporate Secretary ship with CA respectively for 2022-23 Batch and onwards
7.	Discussion on credit in Part V Extension Activity for 2022-23 Batch and onwards
8.	Discussion on PG syllabi in second semester courses for 2022-23 Batch and onwards
9.	Discussion on PG DSE syllabi in second semester courses for 2022-23 Batch and onwards
10.	Discussion on syllabus for PG Inter Disciplinary Course (IDC) offered by Department of Biochemistry in Second semester for 2022-23 Batch and onwards
11.	Discussion on Value Added Certificate Course (VACC)
12.	Any other matter

Cont...



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		12th

MINUTES OF THE TWELVETH BOARD OF STUDIES MEETING

Faculty: Basic and Applied Sciences

Board: Chemistry

The Chairman of BoS welcome all the panel members for the meeting. The items listed in the agenda were taken for discussion.

The following are the minutes of the meeting:

Item - 01	Discussion on UG syllabus for Part III - Core Course in Second semester for 2022-23 Batch and onwards
Discussion	<p>222CE1A2CA- GENERAL CHEMISTRY(New course) Dr. Nandhakumar and Dr.Prabhakaran suggested to change the topic as solid state chemistry of the unit to give relevance to the content</p> <p>222CE1A2CB- ORGANIC, PHYSICAL AND INORGANIC CHEMISTRY (New course) Dr. Nandhakumar and Dr. Subhashini K. Sripathi suggested to add the word separation (gravity separation, froth flotation, magnetic separation and chemical separation). And abbreviations Germanium Tetra chloride (GeCl₄) and Titanium dioxide (TiO₂) to give clarity to the students. Chemistry of Boron, Carbon and Silicon.Cyclic ions (Tropylium cation, Cyclopentadienyl anion, Propyl cation) to enrich the knowledge.</p>
Resolution	The Board unanimously approved the syllabus

Item - 02	Discussion on syllabus for Part III - Inter Disciplinary Course (IDC) offered by Department of Physics in Second semester for 2022-23 Batch and onwards
Discussion	<p>222PY1A2IP-Applied Physics (New Course) The syllabus approved by the Board of Studies in Physics was placed for endorsement.</p>
Resolution	The Board unanimously approved the syllabus

Item - 03	Discussion on syllabi for Part III - Inter Disciplinary Course (IDC) offered to Department of Microbiology, Food Science and Nutrition and Costume Design and Fashion in Second semester for 2022-23 Batch and onwards
Discussion	<p>222CE1A2IA-IDC-Chemistry in Textiles(New Course-CDF) Dr. Shubashini K. Sripathiand Dr. Prabhakaran suggested to add the topic Cleansing action of soap to enhance mechanistic knowledge.</p> <p>222CE1A2IP- IDC Applied Chemistry(New Course-FSN) Dr. Nandhakumar and Dr. Prabhakaran suggested to add Amino acids, classification, zwitter ions, peptides, denaturation of proteins to give sequential learning of the content.</p> <p>222CE1A2IQ- – IDC Basic Chemistry (New Course-Microbiology) Dr. Shubashini and K. Sripathi suggested to give Test for phenols, Test for Amines and Test for Acids to mention the specific compounds to be analyzed.</p>

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		12th

	To include NaBH ₄ a reducing agent to impart knowledge on reduction reactions.
Resolution	The Board members approved the syllabi.

Item - 04	Discussion on Part I (Tamil- /Hindi- /French- /Malayalam) offered by Language departments for 2022-23 Batch and onwards
Discussion	<p>221TL1A2TA: Part I: Tamil-II: Ara Ilakkiyam (New course)</p> <p>221TL1A2HA: Part I: Hindi-II: Modern Literature (New course)</p> <p>221TL1A2FA: Part I: French-II: Grammar, Translation and Civilization (New course)</p> <p>221TL1A2MA: Part I: Malayalam – II: Modern Literature (New course)</p> <p>The unified syllabi approved by the Board of Studies in Languages were placed for endorsement.</p>
Resolution	The Board unanimously approved the syllabi.

Item - 05	Discussion on Part II (Professional English II) offered by English department for 2022-23 Batch and onwards
Discussion	<p>221EL1A2EA : Part II: Professional English II (New Course)</p> <p>The unified syllabus approved by the Board of Studies in English was placed for endorsement.</p>
Resolution	The Board unanimously approved the syllabus.

Item - 06	Discussion on Part IV (AECC) Basic Tamil / Advanced Tamil /Human Rights and Women's rights offered by Department of Tamil and Department of Commerce with Corporate Secretaryship with CA respectively for 2022-23 Batch and onwards
Discussion	<p>221TL1A2AA: Part IV Basic Tamil (New Course)</p> <p>221TL1A2AB: Part IV Advanced Tamil (New Course)</p> <p>223CR1A2AA: Part IV Human Rights and Women's rights(New Course)</p> <p>The unified syllabi approved by the Board of Studies in Tamil and Commerce with Corporate Secretaryship with CA were placed for endorsement.</p>
Resolution	The Board members approved the syllabi.

Item - 07	Discussion on credit for Part V Extension Activity for 2022-23 Batch and onwards
Discussion	One credit to be awarded for each Extension activity like YRC/NCC/NSS/ RRC/Yoga/Sports/Clubs
Resolution	The Board unanimously approved one credit for Extension activity

Item - 08	Discussion on PG syllabi in second semester courses for 2022-23 Batch and onwards
Discussion	<p>The content of the course of II semester of M.Sc. Chemistry 2022 – 23 Batch and onwards were discussed in the board.</p> <p>222CE2A2CA-Stereochemistry and Pericyclic Reactions (New Course)</p>

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	<p>Dr. Shubashini K. Sripathi and Dr. Prabhakaran suggested to add Jablonski diagram for concise explanation and understanding.</p> <p>222CE2A2CB- Bio-inorganic and Organometallic Chemistry (New Course) Dr.Prabhakaran and Dr. Nandhakumar suggested to add Cobalamines, Heme and Non Proteins Hemoglobin as basic compounds before learning organometallic compounds. Nitrogen Fixation and Photosynthesis to create an awareness on the role of microbes in chemistry.</p> <p>222CE2A2CC- Molecular Spectroscopy (New course) Dr.Prabhakaran and Dr. Shubashini K. Sripathi suggested to add Mossbauer Spectroscopy to enrich knowledge in metal ion analysis. Theory of ESR-Instrumentation .Deviation of the value of g- applications of EPR to give basic knowledge on ESR spectroscopy.</p>
Resolution	The Board unanimously approved the syllabi.
Item – 09	Discussion on PG DSE syllabus in second semester course for 2022-23 Batch and onwards
Discussion	222CE2A2DB - Batteries and Fuel Cells (New course) Dr.Prabhakaran and Dr. Nandhakumar suggested to add Factors affecting electrode potential, Charging and discharging and super capacitor to enrich the knowledge.
Resolution	The Board members approved the syllabus.
Item – 10	Discussion on syllabus for PG Inter Disciplinary Course (IDC) offered by Department of Biochemistry in second semester course for 2022-23 Batch and onwards
Discussion	223BC2A2EA:DrugBiochemistry The syllabus approved by the Board of Studies in Biochemistry was placed for endorsement.
Resolution	The Board members approved the syllabus.
Item – 11	Discussion on Value Added Certificate Courses (VACC)
Discussion	The VACC course entitled Paint and Coating Technology offered to the BAS and Biosciences students were discussed
Resolution	The Board members approved the syllabus.
Item – 12	Any other matter

The Chairman of Board of Studies (BoS) thanks all the members for their active participation and providing their valuable suggestions.

Date: 01.12.2022

M. Suganthi
01.12.2022
(Dr. M. Suganthi)
P.G. Chairperson
Department of Chemistry
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

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**B.Sc
SYLLABUS REVISION**

Name of the faculty: BAS
Semester: II

Board: Chemistry

Course Code/Name: GENERAL CHEMISTRY 222CE1A2CA

Unit	Existing	Changes
I	Fundamentals of Organic Chemistry. Electronic displacements: Inductive effect, electromeric effect, resonance, hyperconjugation and steric effect. Strength of organic acids and bases – factors affecting pK-values. Cleavage of bonds: homolysis and heterolysis. Reactive intermediates: Structure and stability of carbocations, carbanions and free radicals.	Alkanes Nomenclature of alkanes, preparation, physical and chemical properties. Conformation of ethane, butane and cyclohexane - Baeyer's strain - Equatorial and axial bonds- 1, 3- diaxial strain- Conformation and reactivity - Conformation of mono and dimethyl cyclohexane.
II	Alkenes and Alkynes Preparation of alkenes - dehydrohalogenation, dehydration, dehalogenation and reduction of alkynes. Reactions of alkenes - addition of halogens, HX (Markovnikov's rule, peroxide effect), H ₂ O and HOCl. Hydroxylation with H ₂ O ₂ , alkaline KMnO ₄ , hydroboration, oxidation and ozonolysis. Alkynes - general preparations and reactions - reduction, addition of H ₂ O and HOCl. Ozonolysis, polymerization and acidity of alkynes.	
III	s Block Elements General characteristics of alkali and alkaline earth metals - anomalous behaviour of lithium and beryllium - diagonal relationships of lithium with magnesium and beryllium with aluminium. Preparation, properties and uses of lithium hydride, sodium peroxide, potassium iodide, calcium carbide, super phosphate of lime, Plaster of Paris and lithopone.	
IV	Crystalline State Differences between crystalline and amorphous solids - symmetry in crystal systems - law of interfacial angles - law of rational indices - Miller indices - space lattice and unit cell - Bravais lattices - Bragg's equation - powder method. Packing in crystals - types of crystals - structure of sodium chloride and CsCl - concept of conductor, semiconductor and superconductor - band theory.	Solid state chemistry Types of semiconductor.
V	Thermodynamics Second law of thermodynamics - Need for second law, different statements, entropy - definition - entropy changes in isothermal expansion of an ideal gas, entropy changes in reversible and irreversible processes, Entropy as a function of T and V, entropy as a function of T and P. Entropy of mixing of ideal gases, physical significance of entropy. General conditions of equilibrium and spontaneity - Conditions of equilibrium and spontaneity under constraints, definition of A and G, physical significance of A and G, Temperature and pressure dependence of G, Maxwells relations, Gibbs - Helmholtz equation.	

Percentage of Syllabus revised: 24 %

Course Focuses on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





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BoS

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B.Sc

SYLLABUS (NEW COURSE)

Board: Chemistry

Name of the faculty: BAS
Semester: II

Course Code/Name: 222CE1A2CB-ORGANIC, PHYSICAL AND INORGANIC CHEMISTRY

Unit	Content
I	Process of Metallurgy Metallurgy - Minerals and ores - Ore dressing - Separation (gravity separation, froth flotation, magnetic separation, chemical separation) - Calcination and roasting. Extraction of metal - Chemical reduction - Auto reduction - Electrolytic reduction - Metal displacement. Thermodynamic principles of metallurgy-Ellingham diagram, observations and its applications. Refining methods - Fractional crystallization - Van Arkel method - electrolytic refining - vapour phase refining-ion exchange method. Occurrence, extraction, properties and uses of Germanium and Titanium - preparation, properties and uses of TiO ₂ .
II	Chemistry of Boron, Carbon, aluminum and Silicon Boron family - Physical properties - Anomalous properties of Boron - Diagonal relationship of boron with silicon. Preparation, properties, structure and uses of orthoboric acid, borax, borazine, boron nitride, diborane and bonding in diboranes. Relative strengths of boron trihalides as Lewis acids. Aluminium - Extraction of aluminium from bauxite - Preparation, properties and uses Aluminium chloride. Carbon family - Physical properties - Catenation - Classification of carbides - preparation, structure and uses of silicones.
III	Arenes and Aromaticity Aromaticity-Huckel's rule (aromatic, non-aromatic, and anti-aromatic molecules) - Structure of benzene - Kekule structure - Molecular orbital structure - Resonance energy and stability of benzene - Benzenoid and non-benzenoid compounds- Cyclic ions - Cyclo propenyl cation, cyclopentadienyl anion and tropylium ion - Electrophilic substitution reactions - Energy profile diagram - Mechanism of halogenation, sulphonation, and nitration -Friedel-Crafts alkylation and acylation.
IV	Alkyl and Aryl Halides Alkyl halides, preparation, chemical reactions - Mechanisms of nucleophilic aliphatic substitution reactions (SN1 and SN2) - Elimination reactions (E1 and E2). Substitution vs elimination. Aryl halides (Cl, Br substitution) - Preparation -properties - uses. Electrophilic and nucleophilic aromatic substitution reaction mechanisms. Comparison of alkyl and aryl halides towards nucleophilic substitution reactions.
V	Chemical Equilibrium, Zeroth and Third Law of Thermodynamics Law of mass action - Thermodynamic treatment of the law of mass action - Van't Hoff reaction isotherm, Temperature dependence of the equilibrium constant - Van't Hoff equation, integrated form of Van't Hoff equation. Homogeneous and heterogeneous systems (NH ₃ , PCl ₅ and CaCO ₃) - Relationship between K _p and K _c - Factors affecting chemical equilibrium - Le Chatlier principle (Haber's and Contact processes) - Zeroth law of thermodynamics - Absolute temperature scale. Statement of third law - Nernst heat theorem.

Percentage of Syllabus revised: 100 %

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





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IDC
SYLLABUS (NEW COURSE)
Board: Chemistry

Name of the faculty: BAS

Semester: II

Course Code/Name: 222CE1A2IA/ CHEMISTRY IN TEXTILES

Unit	Content
I	Vegetable Fibres and Animal Fibres Classification of textile fibres- Essential and desirable properties of textile fibres-Cotton fibre -Physical and Chemical properties,- Purification, Physical and Chemical properties of jute, silk and wool.
II	Regenerated and Synthetic Fibres Rayon - Different types of rayon- Manufacture, Physical and chemical properties of acetate rayon and viscose rayon - Preparation, properties and uses of Polyamidefibres (nylon 6 and 66), polyester (PET) and polyacrylonitrile(PAN).
III	Manufacture of Soap and Detergents Laundry soaps - Manufacture of soap (Hot process, cold process), composition of soap, Cleansing action of soap, types of soap, soapless detergents, chemical action of detergents, detergent manufacture, advantages of detergents.
IV	Stiffening Agents & Bleaches Finishes - Stiffening Agents - Starch (cold water and hot water), other stiffening agents, preparation of starch. Bleaching processes - Bleaching agents- H_2O_2 , NaOCl, bleaching powder and bio-bleaching and their properties- Bleaching of cotton, rayon, wool and synthetic fibers.
V	Stains, Dry cleaning and Laundry process Stains - identification and classification, principles of stain removal. Stain removal- food stains, paint, perfume, tar, turmeric and kum- kum. Dry cleaning - using absorbents, using grease solvents. Laundry Blues and Fluorescent Brightening Agents, types, mechanism and application.

Percentage of Syllabus revised: 100 %

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
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BoS

12th

IDC

SYLLABUS REVISION

Name of the faculty:

BAS

Board: Chemistry

Semester: II

Course Code/Name: 222CE1A2IP/ Applied Chemistry

Unit	Contents
I	Water Sources and impurities, Water quality parameters: Definition and significance of-color, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD, fluoride and chloride. Municipal water treatment: primary treatment and disinfection (UV, Ozonation, break-point chlorination). Desalination of brackish water: Reverse Osmosis. <ol style="list-style-type: none"> 1. Determination of total hardness of water by EDTA method. 2. Determination of permanent hardness of water by EDTA method 3. Estimation of HCl using Na_2CO_3 as primary standard and determination of alkalinity in water sample. 4. Determination of chloride content of water sample by Argentometric method
II	Amino acids, peptides and Proteins Amino acids -classification, zwitter ions - peptides - Structure of proteins - primary, secondary, tertiary and quaternary structure- Colour test for proteins, denaturation of proteins.. <ol style="list-style-type: none"> 5. Identification of amino acids by Paper chromatography 6. Colour test for proteins.
III	Organic compounds Preparation, properties and applications of aspirin, paracetamol Benzoic acid, Salicylic acid, Benzaldehyde, Acetophenone, benzophenone and Aniline. <ol style="list-style-type: none"> 1. Preparation of Methyl salicylate from Salicylic acid (esterification) 2. Preparation of Aspirin from Salicylic acid (acetylation)
IV	Processing of Milk Milk: General composition of milk - Physical properties of milk - Recknagel effect Viscosity and conductivity-Processing of Milk-Boiling -Pasteurization - Sterilization and homogenization -Adulterants - Detection of Preservatives and neutralizers - Estimation of calcium and fat. <ol style="list-style-type: none"> 3. Estimation of calcium in milk powder. 4. Estimation of iodine in common salt.
V	Monosaccharide Classification - Occurrence - Preparation - Structural elucidation - Properties of Glucose and Fructose - <ol style="list-style-type: none"> 5. Estimation of glucose 6. Analysis of simple mono saccharides

Percentage of Syllabus revised: 100 %

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
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IDC SYLLABUS REVISION

Name of the faculty:

BAS

Board: Chemistry

Semester: II

Course Code/Name: 222CE1A2IQ/ BASIC CHEMISTRY

Unit	Contents
I	Solutions Normality, molarity, molality, mole fraction, mole concept. Primary and secondary standards – preparation of standard solutions. Principle of Volumetric analysis (with simple problems). 1. Estimation of oxalic acid by KMnO_4 using a standard oxalic acid solution 2. Estimation of KMnO_4 by thiosulphate using a standard potassium dichromate solution
II	Acids and Bases Acid base theories – Strength of acids and bases – Equilibrium constant and Ionic constant of water- pH, pKa, pKb, Buffer solution, pH and pOH simple calculations. 3. Estimation of HCl by NaOH using a standard oxalic acid solution 4. Estimation of Na_2CO_3 by HCl using a standard Na_2CO_3 Solution.
III	Chemical bonding Types of bonding - Ionic Bond: Nature of ionic bond, factors influencing the formation of ionic bond, Covalent and coordinate bond. 5. Preparation of Inorganic Complexes: Tetraamminecopper(II)sulphate 6. Preparation of Inorganic Complexes: Preparation of Hexathiourealead(II) nitrate. 7. Preparation of Prussianblue.
IV	Basic Organic Chemistry Nomenclature, physical and chemical properties and preparation of carboxylic acid, amine, phenol, amide, ethanol and methanol 8. Test for phenols 9. Test for Amines 10. Test for Acids
V	Volumetric Estimations Chemistry and application of oxidation and reducing agents- KMnO_4 , $\text{K}_2\text{Cr}_2\text{O}_7$, LiAlH_4 , NaBH_4 . 11. Estimation of iron(II) by potassium dichromate using standard Mohr's salt solution 12. Estimation iron(II) sulphate by KMnO_4 using a standard Mohr's salt solution

Percentage of Syllabus revised: 100 %

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





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M.Sc.

SYLLABUS REVISION

Name of the faculty:
Semester: II

BAS

Board: Chemistry

Course Code/Name: 222CE2A2CA - STEREOCHEMISTRY AND PERICYCLIC REACTIONS

Unit	Existing	Changes
I	Stereochemistry Stereoisomerism – symmetry – enantiomers and diastereomers – R and S / E and Z nomenclature. Topicity – homotopic, heterotopic enantiotopic and diastereotopic systems. Stereochemistry of biphenyls, allenes, spiranes, Ansa compounds and helical structures. Asymmetry-synthesis- Cram's and Prelog's rules – asymmetric catalysis.	
II	Conformational Analysis Conformational Analysis of acyclic system: Conformations of ethane, butane and halogenoalkanes - effect of conformation on reactivity- addition and elimination reaction of acyclic systems. Conformational Analysis of Cyclic Compounds: cyclohexane - mono and disubstituted cyclohexane. Physical properties – Von Auwers-Skita rule - Conformation and reactivity of cyclohexane derivatives and decalins.	
III	Organic photochemistry Fundamental concepts – energy transfer – characteristics of photoreactions – photoreduction, photooxidation and photosensitization. Photoreactions of ketones and enones – Norrish Type I and II reactions – Paterno-Büchi reaction – photo-Fries rearrangement – photochemistry of alkenes, dienes and aromatic compounds – di-p-methane rearrangement- Barton reaction.	Jablonski diagram.
IV	Pericyclic reactions Concerted reactions: Conservation of orbital symmetry – Woodward-Hoffman rules. Electrocyclic reactions – 1,3-dienes and 1,3,5-trienes. Analysis of reaction using orbital correlation diagram and FMO methods. Cycloadditions [2+2] and [4+2] – analysis using correlation diagram and FMO methods. Sigmatropic rearrangements – Cope and Claisen rearrangements.	
V	Molecular rearrangements Classification – mechanism and applications of Wagner - Meerwein, Neber, Baeyer-Villiger, Dienone phenol, Favorski, Benzidine, Stevens, Arndt-Eistner, Schmidt, and Wallach rearrangements.	

Percentage of Syllabus revised: 20%

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics



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BoS

12th

M.Sc.SYLLABUS REVISION

Name of the faculty: BAS

Board: Chemistry

Semester: II

Course Code/Name: 22CE2A2CB -BIO-INORGANIC AND ORGANOMETALLIC CHEMISTRY

Unit	Existing	Changes
I	Structure and bonding in organometallics Introduction and classification of organometallic compounds-18 electron and effective atomic number rule- Metal carbon bond types- ionic bond- sigma covalent bond- electron deficient bond- delocalized bond- dative bond- Metal carbonyl complexes- synthesis- structure and reactions of metal carbonyls- the nature of M-CO bonding- binding mode of CO and IR spectra of metal carbonyls, metal carbonyl anions- metal carbonyl hydrides- metal carbonyl clusters- Wade's rule and isolobal relationship- Metal nitrosyl complexes	Cobalamines, Heme and Non Proteins Hemoglobin Reactions of the alkyl cobalamines- One-electron Reduction and Oxidation - Co-C Bond Cleavage - coenzyme B12 - Alkylation reactions of methylcobalamin. Hemoglobin and Myoglobin -Blue copper proteins- Oxygen transport and storage - Electron transfer and Oxygen activation. Cytochromes, Ferredoxins and Rubredoxins - Model systems, mononuclear non-heme iron enzymes.
II	Metal-alkylidene/alkene/alkyne complexes Synthesis of alkylidene complexes in low oxidation states and in high oxidation states. Alkene complexes - synthesis -bonding - reactivity - ligand substitution -reactions with nucleophiles. Olefin hydrogenation- Wilkinson's catalyst- hydrosilation- Wacker process- Alkyne complexes - synthesis by reduction method. Insertion reactions - cobalt catalyzed alkyne cycloaddition with nitrile, alkene and alkyne.	
III	Metallocenes Cyclopentadienyl complexes - metallocenes - synthesis of metallocenes - reactions of metallocenes - redox reactions of ferrocene-substitution reactions on Cp ring -Application of ferrocenes - blood glucose sensors - Anticancer drugs - synthesis of bent metallocene complexes - reactivity of bent metallocenes- halide metathesis- ligand exchange by reduction- cyclopentadiene as a non-spectator ligand	Substitution, bonding and structure of arene complexes
IV	Metal ions in biological system Classification of elements according to their action in biological systems, Na & K ion transport, Na / K pump. Consequences of excess and deficiency of trace metals. Toxicity of metal ions (Hg, Pb, Cd and As) - reasons for toxicity. Use of chelating agents in medicine. Bio-membranes and calcium carriers	Cis platin mode of action.
V	Medicinal Applications Pt complexes in cancer therapy: Cisplatin and its mode of action - cytotoxic compounds of other metals- Gold containing drugs as antirheumatic agents and their mode of action - Lithium in psychopharmacological drugs- Metal complexes as probes of nucleic acid- Function of metal ions in genetic regulation.	Nitrogen Fixation and Photosynthesis Nitrogenase enzyme: Introduction, types of nitrogen fixing microorganisms, metal clusters in nitrogenase. Nitrogen fixation pathway. Biological redox reactions. Chlorophyll - Light and dark phase reactions of photosynthesis.

Percentage of Syllabus revised: 40%

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





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M.Sc SYLLABUS REVISION

Name of the faculty: BAS Board: Chemistry
Semester: II Course Code/Name: 222CE2A2CC -MOLECULAR OF SPECTROSCOPY

Unit	Existing	Changes
I	Introduction, Microwave and Raman Spectroscopy Electromagnetic radiation - interaction of electromagnetic radiation with molecules - types of molecular spectroscopy - factors affecting line-width and intensity - signal to noise ratio and resolving power. Microwave Spectroscopy - Rotation of molecules - rotational spectra of rigid rotator, intensities of rotational lines, effect of isotopic substitution - rotational spectrum of non-rigid rotator - linear & symmetric top molecules - Stark effect. Applications of microwave spectroscopy - determination of bond length, bond angle dipole moment and atomic mass from microwave spectra. Raman spectroscopy - classical and quantum theory of Raman effect - rotational Raman spectra of linear and symmetric top molecules - vibrational Raman spectra. Rule of mutual exclusion principle. Instrumentation.	Microwave Spectroscopy
II	Infrared and Electronic spectroscopy	Electronic and Infrared spectroscopy
III	NMR Spectroscopy-I Nuclear spin states and NMR active nuclei, nuclear magnetic moments - mechanism of resonance absorption - population of nuclear spin states. 1H NMR Spectroscopy - Multiplicity - Coupling constant - First order and second order proton, Spin-spin splitting - Dependence of J on dihedral angle - Vicinal and geminal coupling constants - Karplus equation - Long range coupling constants - Factors influencing coupling constant, splitting of nmr signals- AB, AX and AMX types - Influence of stereochemical factors on chemical shift of protons.	13C nucleus, chemical shifts, spin-spin splitting, double resonance techniques - homonuclear and hetero nuclear decoupling, broad band decoupling, off resonance decoupling, 13C relaxation mechanism - Overhauser effect. FT and 2D NMR spectroscopy: principle of FT-NMR, FID, Introduction of 2D techniques: DEPT, J-resolved, H-H COSY, C-H COSY, HMBC and NOESY spectra. NMR imaging-MRI
IV	NMR Spectroscopy-II 13C nucleus, chemical shifts, spin-spin splitting, double resonance techniques - homonuclear and hetero nuclear decoupling, broad band decoupling, off resonance decoupling, 13C relaxation mechanism - Overhauser effect. FT and 2D NMR spectroscopy: principle of FT-NMR, FID, Introduction of 2D techniques: DEPT, J-resolved, H-H COSY, C-H COSY, HMBC and NOESY spectra. NMR imaging-MRI	Mossbauer Spectroscopy Principle-Recoil-free emission and absorption. Instrumentation-Nuclear Quadrupole interaction-Zeeman splitting- Mossbauer nuclides- Mossbauer effect-Doppler velocity shift-Doppler effect-Effect of Magnetic field and applications.
V	ESR Spectroscopy Electron spin - Electronic Zeeman effect - Presentation of the spectrum-EPR spectrum of hydrogen atom (first order treatment) - g factors - Hyperfine splitting: nuclear spin ($I=1/2, 1, 3/2, 5/2$) interaction with electron spin - hyperfine coupling constants - EPR spectra of organic radicals (AA and AB type). Theory of EPR spectroscopy - spin densities and McConnell relationship - factors affecting the magnitude of g and A tensors in metal species - zero-field splitting and Kramers degeneracy - spectra of V(II), Mn(II), Co(II) and Cu(II) complexes - applications of EPR to a few biological molecules containing Cu(II) and Fe(III) ions.	Theory of ESR-Instrumentation. Deviation of the value of g- applications of EPR.

Percentage of Syllabus revised: 45%
Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
<input type="checkbox"/>	Social Awareness/ Environment	<input type="checkbox"/>	Constitutional Rights/ Human Values/ Ethics





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M.Sc
SYLLABUS (NEW COURSE)
Board: Chemistry

Name of the faculty: BAS

Semester: II

Course Code/Name: 222CE2A2DA- CHEMISTRY OF COSMETICS AND PERFUMES

Unit	Content
I	Skin Creams and Humectants Skin Creams- Introduction, classification of skin creams, cleansing creams, Night and massage creams, Moisturizing, vanishing and foundation creams, Pigmented foundation creams, hand creams, hand and body cream. Humectants - Introduction, drying out, types, hygroscopicity, stability, safety, Application of humectant. Antioxidants and Application of antioxidants.
II	Bath and Oils Bath Preparation: Foam baths, Introduction, formulation and foam baths, types of products, product assessment, bath salts, ingredient and formulations. Bath Oils: introduction floating and spreading oils, dispersible or blooming oils soluble oils, foaming oils.
III	Mask and aroma therapy Setting masks-Peel off masks- Thermal types- paraffin wax masks - Non-setting masks-Hot oil marks. Aroma therapy-Methods of extraction of essential oils, Blending & precautions, Properties of essential oils & carrier oils, Patch testing, safety & precautions- Different aroma therapy formulations for skin and hair care.
IV	Extraction methods of Essential oils Essential oils - Methodology of production, water distillation, Steam distillation, treatment of condensate water after distillation-Flower oils - Extraction with cold fat and hot fat, alcoholic extracts, absolute of enfleurages and chassiss. Extraction with volatile solvents, selection of solvent and extraction apparatus.
V	Industrial important essential oils properties and uses of following- Eugenol, Pinene, Linalool, Citral and Geraniol. Flavours - Sources and properties of Vanilla, Rose, Pineapple, Peppermint, Mango, Raspberry, Orange & Lemon.

Percentage of Syllabus revised: 100 %

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
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M.Sc

SYLLABUS (NEW COURSE)

Name of the faculty: BAS
Semester: II

Board: Chemistry

Course Code/Name: 222CE2A2DB- BATTERIES AND FUEL CELLS

Unit	Content
I	Electrochemistry The Reaction quotient (Q) for a chemical reaction - The Electrode potential (E) - electrochemical series for non-standard conditions using the Nernst Equation, - Rate of reaction and types of over-voltages in galvanic and electrolytic cells and the Tafel Equation - Efficiency of chemical energy conversion: batteries versus heat engines.
II	Introduction to Batteries Primary cells - Secondary batteries - Battery charging and discharging curves for secondary batteries - Specific power and specific energy, Ragone plot - Energy efficiency of batteries, energy out in during - Energy efficiency of batteries versus that of heat engines for converting chemical energy into work
III	Batteries for Electric and Hybrid Vehicles Battery packs, voltage and state of charge, coulomb counting - Energy in a battery (kW h) and charge in a battery (A h); C-rate of charging and discharging, Peukert Equation - Coulombic efficiency of batteries and battery lifetime - Battery pack control module.
IV	Fuel cells Fuel Cells: Description, working principle, anodic, cathodic and cell reactions, fabrication of electrodes and other components, applications, advantages, disadvantages and environmental aspects of the following types of fuel cells: Proton Exchange Membrane Fuel Cells, alkaline fuel cells, phosphoric acid, solid oxide, molten carbonate, direct methanol fuel cells.
V	Additional Energy Storage Devices and Renewable Energy Hydrogen fueling system and hydrogen storage aboard vehicles- Comparison of fuel cells and batteries for powering electric vehicles. Capacitors: storing charge-Flywheels: storing kinetic energy - Compressed air: storing potential energy- Renewable energy and synergy with electric vehicles.

Percentage of Syllabus revised: 100 %

Course Focus on:

<input checked="" type="checkbox"/>	Skill Development	<input type="checkbox"/>	Entrepreneurial Development
<input checked="" type="checkbox"/>	Employability	<input type="checkbox"/>	Innovations
<input type="checkbox"/>	Intellectual Property Rights	<input type="checkbox"/>	Gender Sensitization
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**M.Sc
SYLLABUS (NEW COURSE)**

Name of the faculty: BAS
Semester: II


Board: Chemistry
Course Code/Name: 222CE2A2DC -ORGANIC REACTIONS AND REAGENTS

Unit	Contents
I	Reagents in Oxidation Reactions Chromium oxidant - PCC, PDC, CrO ₃ , Chromic acid, Jones reagents, Manganese oxidant - KMnO ₄ , MnO ₂ . Peracids - alkenes, ketones and heterocycles, singlet oxygen, ozone, OsO ₄ , HIO ₄ , Ag ₂ O, Bio-oxidations - bacterium acetic, invertase, putida, Micrococcus sp, Gibberella, Streptomyces.
II	Reagents in Reduction Reactions Palladium / platinum / nickel based heterogeneous catalysts for hydrogenation, Wilkinson's catalyst, Noyori asymmetric hydrogenation - reductions using Li/Na/Ca in liquid ammonia. Metal hydrides - LiAlH ₄ , NaBH ₄ , NaBH ₃ CN - hydrazine, tin hydrochloride, NaHSO ₃ , NaSH, Luche reduction.
III	Name reactions and their Applications-I Epoxidation coupling (Suzuki, Heck, Sonogashira, Negishi and Stille) - Multicomponent reactions. Multicomponent reactions using alkyl isocyanides: Passerini and Ugi-4-component synthesis. Domino/cascade reactions.
IV	Name reactions and their Applications-II Mechanism and applications of Robinson Annulation, Ene reaction, Hofmann isonitrile synthesis, Doebner-Miller synthesis, Nef reaction, Eschweiler Clark reaction, Bucherer reaction, Leuckart reaction, Willegerodt-Kindler reaction.
V	Reagents and their applications Synthesis and application of LTA, LDA, DCC, DDQ, TMS-iodide, TMS-cyanide, TBDMS Chloride, 1,3-Dithiane (reactivity and umpolung), Merrifield resin, Baker's yeast.

Percentage of Syllabus revised: 100 %
Course Focus on:

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ATTENDANCE OF THE TWELFTH BOARD OF STUDIES MEETING

Faculty: Basic and Applied Science

Board: Chemistry

S. No	Name	Designation	Signature
1.	Dr. M. SUGANTHI Assistant Professor Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48	Chairman	
2.	Dr. R. PRABHAKARAN Assistant Professor, Department of Chemistry, Bharathiar University, Coimbatore-46.	Vice Chancellor Nominee	 01/12/2022
3.	Dr. SHUBASHINI K. SRIPATHI Professor of Chemistry School of Physical Sciences and Computational Sciences, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore-43.	Subject Expert	 01/12/22
4.	Dr. R. NANDHAKUMAR Professor of Applied Chemistry School of Sciences, Karunya Institute of Technology and Sciences, Coimbatore-114.	Subject Expert	 01/12/22
5.	Mr. E. MUTHUSAMY Priyadarshini Chemicals. Pvt. Ltd Nava India, Coimbatore - 641006.	Industry Expert	ABSENT
6.	Ms. S. JEEVITHA Quality Analyst Food Analysis Laboratory Race Course road, Coimbatore-18.	Alumni	ABSENT
7.	Dr. R. RAVIKUMAR Associate Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
8.	Dr. M. R. EZHILARASI Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	 11/12/2022
9.	Dr. M. DINESH KUMAR Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	

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10.	Mrs. P. KAVITHA Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
11.	Dr. R. MENAKA Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
12.	Dr. M. MOHANRAJ Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
13.	Dr. R. RAJKUMAR Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
14.	Dr. S. SHYAM SIVAPPAN Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	ABSENT
15.	Dr. N. KUPPUCHAMY Professor and Head, Department of Tamil, Dr. N.G.P Arts & Science College, Coimbatore-48.	Co-opted member	
16.	Dr. R. VITHYA PRABHA Professor and Head, Department of English, Dr. N.G.P Arts & Science College, Coimbatore-48.	Co-opted member	
17.	Dr. K. GIRIJA Assistant Professor and Head, Department of Physics, Dr. N.G.P Arts & Science College, Coimbatore-48.	Co-opted member	
18.	Dr. R. SOWRIRAJAN Assistant Professor and Head, Department of Maths, Dr. N.G.P Arts & Science College, Coimbatore-48.	Co-opted member	
19.	Dr. D. SRIDEVI Professor & Head Department of Food Science & Nutrition, Dr. N.G.P Arts & Science College, Coimbatore-48.	Co-opted member	ABSENT
20.	Dr. J. RENGARAJAN Professor & Head Department of Microbiology, Dr. N.G.P Arts & Science College, Coimbatore-48.	Co-opted member	
21.	Ms. R. KAMALEE III B.Sc. Chemistry Department of Chemistry,	Student Representative	

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	Dr. N.G.P Arts & Science College, Coimbatore-48.		
22.	Ms. R. KEERTHANA II M.Sc. Chemistry Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Student Representative	

Date: 01/12/2022



(Dr. M. SUGANTHI)
B-S Chairman/HoD
Department of Chemistry
Dr. N. G. P. Arts and Science College
Coimbatore -- 641 048

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