

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

Approved by Government of Tamil Nadu & Accredited by NAAC with 'A++' Grade (3rd Cycle-3.64 CGPA)

Dr. N.G.P.-Kalapatti Road, Coimbatore-641 048, Tamil Nadu, India.

Website: www.drngpasc.ac.in | Email: info@drngpasc.ac.in. | Phone: +91-422-2369100

BoS

12th

### 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:

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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
<b>Members Attended</b>	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





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Faculty: Basic and Applied Sciences

**Board: Chemistry** 

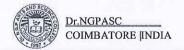
The Chairman of BoS welcome all the panel members for the meeting. The items listed in the agenda were taken for discussion.

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	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
	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 (GeCl <sub>4</sub> ) and Titanium dioxide (TiO <sub>2</sub> ) to give
	clarity to the students. Chemistry of Boron, Carbon and Silicon. Cyclic ions (Tropylium cation, Cyclopentadieneyl anion, Propyl cation) to enrich the knowledge.
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	222PY1A2IP-Applied Physics (New Course) The syllabus approved by the Board of Studies in Physics was placed for endorsement.
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	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.
, e, e	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.
	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.





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	To include NaBH <sub>4</sub> 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

Item - 04	Discussion on Part I (Tamil-/Hindi-/French-/Malayalam) offered by Language departments for 2022-23 Batch and onwards
Discussion	221TL1A2TA: Part I: Tamil-II: Ara Ilakkiyam (New course) 221TL1A2HA: Part I: Hindi-II: Modern Literature (New course) 221TL1A2FA: Part I: French-II: Grammar, Translation and Civilization (New course) 221TL1A2MA: Part I: Malayalam – II: Modern Literature (New course) The unified syllabi approved by the Board of Studies in Languages were placed for endorsement.
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	221EL1A2EA: Part II: Professional English II (New Course) The unified syllabus approved by the Board of Studies in English was placed for endorsement.
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	221TL1A2AA: Part IV Basic Tamil (New Course) 221TL1A2AB: Part IV Advanced Tamil (New Course)
	223CR1A2AA: Part IV Human Rights and Women's rights(New Course) The unified syllabi approved by the Board of Studies in Tamil and Commerce with
	Corporate Secretaryship with CA were placed for endorsement.
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	The content of the course of II semester of M.Sc. Chemistry 2022 – 23 Batch and onwards were discussed in the board.
	222CE2A2CA-Stereochemistry and Pericylic Reactions (New Course)





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Item – 12	Any other matter
Resolution	The Board members approved the syllabus.
Discussion	The VACC course entitled Paint and Coating Technology offered to the BAS and Biosciences students were discussed
Item – 11	Discussion on Value Added Certificate Courses (VACC)
Resolution	The Board members approved the syllabus.
Discussion	223BC2A2EA:DrugBiochemistry  The syllabus approved by the Board of Studies in Biochemistry was placed for endorsement.
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
Resolution	The Board members approved the syllabus.
Item – 09 Discussion	Discussion on PG DSE syllabus in second semester course for 2022-23 Batch and onwards  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 unanimously approved the syllabi.
	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.
	Dr. Shubashini K. Sripathi and Dr. Prabhakaran suggested to add Jablonski diagram for concise explanation and understanding.  222CE2A2CB- Bio-inorganic and Organometallic Chemistry (New Course)  Dr. Prabhakaran and Dr. Nandhakumar suggested to add Cobalamines, Heme and Nor Proteins Hemoglobin as basic compounds before learning organometallic compounds. Nitrogen Fixation and Photosynthesis to create an awareness on the role of microbes in chemistry.

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

Date: 01.12.2022

(Dr. M. Suganthi)

E. N. G. P. Arts and Science College Coimbatore – 641 048





Name of the faculty:

BAS

# Dr. N.G.P. ARTS AND SCIENCE COLLEGE

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#### B.Sc SYLLABUS REVISION

	ne of the faculty:  BAS  Board: Chemistry  Course Code/Name: GENERAL CHEMISTRY 222 CELA2CA	
Unit	To most Do may timilet OEs (Estate Criterials)	
The Contract of the Contract o	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	difficulty cyclonexane.
	Preparation of alkenes - dehydrohalogenation, dehydration, dehalogenation and reduction of alkynes. Reactions of alkenes - addition of halogens, HX(Markovnikov's rule, peroxide effect), H <sub>2</sub> O and HOCl. Hydroxylation with H <sub>2</sub> O <sub>2</sub> , alkaline KMnO <sub>4</sub> , hydroboration, oxidation and ozonolysis. Alkynes - general preparations and reactions - reduction, addition of H <sub>2</sub> 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 andberyllium 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	Solid state chemistry
	Differences between crystalline and amorphous solids - symmetry in crystal systems - law of interfacial angles -law of rational indices - Miller indices - spacelattice and unit cell- Bravis lattices-Bragg's equation - powder method. Packing incrystals - types of crystals - structure of sodium chloride and CsCl - concept of conductor, semiconductor and superconductor- band theory.	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 Tand 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 andspontaneity under constraints, definition of A and G, physical significance of A andG, Temperature and pressure dependence of G, Maxwells relations, Gibbs -Helmholtz equation.	
Percenta	age of Syllabus revised: 24 %	
	Focuses on:	
✓	Skill Development	Entrepreneurial Development
<b>✓</b>	Employability	Innovations
	Intellectual Property Rights	Gender Sensitization
	Social Awareness/ Environment	Constitutional Rights/ Human Values/ Ethics





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Name of the faculty:BAS Semester: II

### SYLLABUS (NEW COURSE)

Board: Chemistry

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 <sub>2</sub> .	
n	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 Aluminum chloride. Carbon family – Physical properties – Catenation - Classification of carbides - preparation, structure and uses of silicones.	
Ш	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. Comparision 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 <sub>3</sub> , PCl <sub>5</sub> and CaCO <sub>3</sub> ) - Relationship between Kp and Kc - 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:

Skill Development	Entrepreneurial Development
Employability	Innovations
Intellectual Property Rights	Gender Sensitization
Social Awareness/ Environment	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).	
Ш	Manufacture of Soap and Detergents Laundry soaps - Manufacture of soap (Hot process, cold process), composition of soap, Cleansing action of soap, ty 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 <sub>2</sub> O <sub>2</sub> , NaOCl, bleaching powder and bio-bleaching and their properties- Bleaching of cotton, rayon, wool and synthetic fibers.	
W 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:

1	Skill Development	Entrepreneurial Development
1	Employability	Innovations
	Intellectual Property Rights	Gender Sensitization
	Social Awareness/ Environment	Constitutional Rights/ Human Values/ Ethics



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SYLLABUS REVISION

Name of t	he 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, flouride and chloride. Municipal water treatment: primary treatment and disinfection
	(UV, Ozonation, break-point chlorination). Desalination of brackish water: Reverse Osmosis.
	Determination of total hardness of water by EDTA method.
	2. Determination of permanent hardness of water by EDTA method
	<ol> <li>Estimation of HCl using Na<sub>2</sub>CO<sub>3</sub> as primary standard and determination of alkalinity in water sample.</li> <li>Determination of chloride content of water sample by Argentometric method</li> </ol>
II	Amino acids, peptidesand Proteins
	Amino acids -classification, zwitter ions - peptides - Structure of proteins - primary, secondary, tertiary and quaternary
	structure- Colour test for proteins, denaturation of proteins
	5. Identification of amino acidsby Paper chromatography
	6. Colour test for proteins.
III	Organic compounds
	Preparation, properties and applications of aspirin, paracetamol Benzoic acid, Salicylic acid, Benzaldehyde,
	Actophenone, benzophenone and Aniline.
	Preparation of Methyl salicylate from Salicylic acid (esterification)
	2. Preparation of Asprin 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 - Sterlilzation and homogenization - Adulterants -
	Detection of Preservatives and neutralizers - Estimation of calcium and fat.
	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 -
	5. Estimation of glucose
	6. Analysis of simple mono saccharides

Percentage of Syllabus revised: 100 % Course Focus on:

Skill Development	Entrepreneurial Development
✓ Employability	Innovations
Intellectual Property Rights	Gender Sensitization
Social Awareness/ Environment	Constitutional Rights/ Human Values/ Ethics



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#### IDC SYLLABUS REVISION

**Board: Chemistry** Name of the faculty: BAS Course Code/Name: 222CE1A2IQ/ BASIC CHEMISTRY Semester: II Contents Unit Solutions Normality, molarity, molality, mole fraction, mole concept. Primary and secondary standards - preparation of standard solutions. Principle of Volumetric analysis (with simple problems). Estimation of oxlaic acid by KMnO4 using a standard oxalic acid solution Estimation of KMnO<sub>4</sub> 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. Estimation of HCl by NaOH using a standard oxalic acid solution Estimation of Na<sub>2</sub>CO<sub>3</sub> by HCl using a standard Na<sub>2</sub>CO<sub>3</sub> Solution. Chemical bonding III Types of bonding - Ionic Bond: Nature of ionic bond, factors influencing the formation of ionic bond, Covalent and coordinate bond.  $Preparation \ of \ Inorganic \ Complexes: \ Tetra ammine copper (II) sulphate$ Preparation of Inorganic Complexes: Preparation of Hexathiourealead(II) nitrate. Preparation of Prussianblue. IV **Basic Organic Chemistry** Nomenclature, physical and chemical properties and preparation of carboxilic acid, amine, phenol, amide, ethanol and methanol Test for phenols iks. 8. 9. Test for Amines Test for Acids 10. V Volumetric Estimations Chemistry and application of oxidation and reducing agents- KMnO4, K2Cr2O7, LiAlH4, NaBH4. 11. Estimation of iron(II) by potassium dichromate using standard Mohr's salt solution

12. Estimation iron(II) sulphate by KMnO4 using a standard Mohr's salt solution Percentage of Syllabus revised: 100 %

Course Focus on:

✓ Skill Development	Entrepreneurial Development
Employability	Innovations
Intellectual Property Rights	Gender Sensitization
Social Awareness/ Environment	Constitutional Rights/ Human Values/ Ethics



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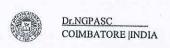
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M.Sc. SYLLABUS REVISION

Name of Semester	of the faculty: BAS Board: Chemistry eer; II Course Code/Name: 222CE2A2CA - STEREOCHEMISTRY AND PERICYLIC REACTIONS		
Unit	Existing	Changes	
I	Stereochemistry		
	Stereoisomerism – symmetry – enantiomers and diastereomers – R a E and Z nomenclature. Topicity – homotopic, heterotopic enantiotop diastereotopicsystems. Stereochemistry of biphenyls, allenes, sp Ansa compounds and helical structures. Asymmetry-synthesis – Cran Prelog's rules – asymmetriceatalysis.	oic and iranes,	
П	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 Compocyclohexane - mono and disubstituted cyclohexane. Physical properti Von AuwersSkitta rule—	ounds: es—	
III	Conformation and reactivity of cyclohexane derivatives and decalins.  Organic photochemistry	Jablonski diagram.	
	Fundamental concepts – energy transfer – characteristics of photorec – photoreduction, photooxidation and photosensitization. Photoreactiketones  and enones – Norrish Type I and II reactions – Paterno-Büchi reaction	ions of	
	photo-Fries rearrangement – photochemistry of alkenes, dienes and aromatic compounds – di-p-methane rearrangement– Barton reaction.		
IV	Pericylic 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 methody and [4+2] – analysis using correlation diagram a FMO methods. Sigmatropic rearrangements – Cope and Claisen rearrangements.	ods.	
V	Molecular rearrangements  Classification - mechanism and applications of Wagner - Meerwein, N Baeyer-Villiger, Dienone phenol, Favorski, Benzidine, Stevens, ArdntBister, Schmidt, and Wallach rearrangements.	Neber,	
Percentag Course F	ge of Syllabus revised: 20%		
<b>✓</b>	Skill Development	Entrepreneurial Development	
<b>√</b>	Employability	Innovations	
	Intellectual Property Rights	Gender Sensitization	
	Social Awareness/ Environment	Constitutional Rights/ Human Values/ Ethics	





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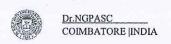
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### M.Sc.SYLLABUS REVISION

Name of t Semester:	\$45 \tau 1 \tau	Chemistry IC 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—sigmacovalent bond—electron deficient bond—delocalized bond—dative bond. Metalcarbonyl complexes—synthesis—structure and reactions of metal carbonyls—thenature of M-CO bonding—binding mode of CO and IR spectra of metal carbonyls,metal carbonyl anions—metal carbonyl rhydrides—metal carbonyl clusters—Wade'srule and isolobal relationship Metal-nitrosyl complexes	Cobalamines, Heme and Non Proteins Hemoglobin Reactions of the alkyl cobalamins- 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.
11	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-ep-ring -Application of ferrocenes - blood glucose sensors - Anticancer drugs - synthesis ofbent metallocene complexes - reactivity of bent-metallocenes - halide-metathesis - ligand-exchange-by-reduction - eyclopentadiene 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 chelatingagents in medicine. Bio-membranes and ealeium 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.
Percentag Course Fo	ge of Syllabus revised: 40% ocus on:	
1	Skill Development Ent	trepreneurial Development
<b>✓</b>	Employability	novations
	Intellectual Property Rights	ender Sensitization



Social Awareness/ Environment

Constitutional Rights/ Human

Values/ Ethics



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M.Sc SYLLABUS REVISION **Board:** Chemistry

Name		Chemistry
Semes		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 - signalto noise ratio and resolving power. Microwave Spectroscopy - Rotation of molecules - rotational spectra of rigid rotator, intensities of rotational lines, effect of isotopic substitution - rotationalspectrum of non-rigid rotator - linear & symmetric top molecules - Stark effect. Applications of microwave spectroscopy - determination of bond length, bondangle 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 Ruleof mutual exclusion principle-Instrumentation.	Microwave Spectroscopy
II	Infrared and Electronic spectroscopy	Electronic and Infrared spectroscopy
Ш	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-spinsplitting – Dependence of J on dihedral angle – Vicinal and geminal couplingconstants – Karplus equation – Long range coupling constants – Factors influencingcoupling constant, splitting of nmr signals- AB, AX and AMX types - Influence ofstereochemical 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
IV	NMR-Spectroscopy-II 13C nucleus, chemical shifts, spin-spin-splitting, double-resonance techniques-homonuclear and hetero nuclear decoupling, broad band decoupling, off-resonancedecoupling, 13C relaxtion mechanism—Overhauser effect. FT and 2D NMR-spectrscopy:-principle of FT-NMR, FID, Introduction of 2Dechniques:-DEPT, J resolved, H,H-COSY, C,H-COSY, HMBC and NOESY spectra-NMRImaging-MRI	Mossbauer Spectroscopy  Principle-Recoil-free emission and absorption- Instrumentation-Nuclear Quadrubole interaction- Zeeman spliting- Mossbauer nuclides- Mossbauer effect-Doppler velocity shift-Doppler effect-Effect of Magnetic field and applications.
	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 - hyperfinecoupling 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.  entage of Syllabus revised: 45% se Focus on:	Theory of ESR-Instrumentation .Deviation of the value of g- applications of EPR.
✓	Skill Development	Entrepreneurial Development
✓	Employability	Innovations
	Intellectual Property Rights	Gender Sensitization
	Social Awareness/ Environment	Constitutional Rights/ Human

Values/ Ethics





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M.Sc SYLLABUS (NEW COURSE) Board: Chemistry

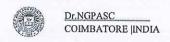
Name of the faculty:BAS

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

Constitutional Rights/ Human

Values/ Ethics

Semester	r: II Course Code/Name: 2	22CE2A2DA- 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 enflurages and chassis. 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.		
	ge of Syllabus revised: 100 % Focus on:		
✓ -	Skill Development	Entrepreneurial Development	
1	Employability	Innovations	
	Intellectual Property Rights	Gender Sensitization	



Social Awareness/ Environment



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SYLLABUS (NEW COURSE) Board: Chemistry

Name of Semester	the faculty: BAS Board: Chemistry : II Course Code/Name: 222CE2A2DB-BATTERIES AND FUEL CELLS
Unit	Content
I	Electrochemistry  TheReaction quotient (Q)for a chemical reaction - TheElectrodepotential (E) - electrochemical series for non-standard conditions-using the Nernst Equation,-Rateof reaction and types of over-voltages in galvanic and electrolytic cells and the Tafel Equation - Efficiency of chemical energy conversion: batteries versus heat-engines.
п	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, energyout 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:

1	Skill Development	Entrepreneurial Development
✓	Employability	Innovations
	Intellectual Property Rights	Gender Sensitization
	Social Awareness/ Environment	Constitutional Rights/ Human Values/ Ethics



Name of the faculty:

BAS

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**Board: Chemistry** 

#### M.Sc SYLLABUS (NEW COURSE)

Course Code/Name: 222CE2A2DC -ORGANIC REACTIONS AND REAGENTS Semester: II Unit Contents Reagents in Oxidation Reactions I Chromium oxidant - PCC, PDC, CrO3, Chromic acid, Jones reagents, Manganese oxidant - KMnO4, MnO2. Peracids alkenes, ketones and heterocycles, singlet oxygen, ozone, OsO4, HIO4, Ag2O, 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 - LiAlH4, NaBH4, NaBH<sub>3</sub>CN - hydrazine, tin hydrochloride, NaHSO<sub>3</sub>, NaSH, Luche reduction. III Name reactions and their Applications-I Epoxidation coupling (Suzuki, Heck, Sonogashira, NegishiandStille) - Multicomponent reactions. Multicomponent reactions using alkyl isocyanides: Passerini and Ugi-4-component synthesis. Domino/cascade reactions. Name reactions and their Applications-II IV Mechanism and applications of Robinson Annulation, Ene reaction, Hofmann isonitrilesyntehsis, Doebner-Miller

synthesis, Nef reaction, Eschweiler Clark reaction, Bucherer reaction, Leukart reaction Willegerodt-Kindler reaction.

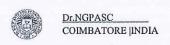
Synthesis and application of LTA, LDA, DCC, DDQ, TMS-iodide, TMS-cyanide, TBDMS Chloride, 1,3-Dithiane

Percentage of Syllabus revised: 100 % Course Focus on:

Reagents and their applications

(reactivity and umpolung), Merrifield resin, Baker's yeast.

<b>√</b>	Skill Development	Entrepreneurial Development
<b>√</b>	Employability	Innovations
	Intellectual Property Rights	Gender Sensitization
	Social Awareness/ Environment	Constitutional Rights/ Human Values/ Ethics





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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	whi
2.	Dr. R. PRABHAKARAN Assistant Professor, Department of Chemistry, Bharathiar University, Coimbatore-46.	Vice Chancellor Nominee	R Rh inter
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	Shirtz
4.	Dr. R. NANDHAKUMAR Professor of Applied Chemistry School of Sciences, Karunya Institute of Technology and Sciences, Coimbatore-114.	Subject Expert	Confining
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	2,99
8.	Dr. M. R. EZHILARASI Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	Mortilare
9.	Dr. M. DINESH KUMAR Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	NAG





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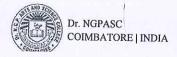
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12<sup>th</sup>

	Mrs. P. KAVITHA		AL AL
10.	Assistant Professor,	Intomal Manda	1 a W
10.	Department of Chemistry,	Internal Member	- Josa
	Dr. N.G.P Arts & Science College, Coimbatore-48.		
	Dr. R. MENAKA		R. Menail
11.	Assistant Professor,		D Kener
11.	Department of Chemistry,	Internal Member	4.1
	Dr. N.G.P Arts & Science College, Coimbatore-48.		
	Dr. M. MOHANRAJ		77
12.	Assistant Professor,		
12.	Department of Chemistry,	Internal Member	most.
*	Dr. N.G.P Arts & Science College, Coimbatore-48.		1
	Dr. R. RAJKUMAR		
13.	Assistant Professor,		00 ~
13.	Department of Chemistry,	Internal Member	+ gays
	Dr. N.G.P Arts & Science College, Coimbatore-48.		/ (
	Dr. S. SHYAM SIVAPPAN		
1.4	Assistant Professor,	A STATE OF THE STA	BETT TO SE
14.	Department of Chemistry,	Internal Member	ABSENI
	Dr. N.G.P Arts & Science College, Coimbatore-48.		
	Dr. N. KUPPUCHAMY		01/
1.5	Professor and Head,	line and the second	Dall 18
15.	Department of Tamil,	Co-opted member	01/01
	Dr. N.G.P Arts & Science College, Coimbatore-48.		
	Dr. R. VITHYA PRABHA		
16	Professor and Head,		
16.	Department of English,	Co-opted member	1 Sept
	Dr. N.G.P Arts & Science College, Coimbatore-48.		5.1
	Dr. K. GIRIJA		
1.77	Assistant Professor and Head,		/
17.	Department of Physics,	Co-opted member	4/4 10/2/22
	Dr. N.G.P Arts & Science College, Coimbatore-48.		Told Liliston
	Dr. R. SOWRIRAJAN		3
10	Assistant Professor and Head,	The state of the second of the	11.11
18.	Department of Maths,	Co-opted member	I MAN
	Dr. N.G.P Arts & Science College, Coimbatore-48.		to play
165	Dr. SRIDEVI		
10	Protessor & Head		Turkey -
19.	Department of Food Science & Nutrition,	Co-opted member	ABJEM
	Dr. N.G.P Arts & Science College, Coimbatore-48.		
777	Dr. J. RENGA RAMANUJAM		
0.0	Professor & Head	Lucia de la	1 1 1
20.	Department of Microbiology,	Co-opted member	R M
	Dr. N.G.P Arts & Science College, Coimbatore-48.		The Wall
	Ms. R. KAMALEE	THE RESERVOIS	
21.		Student	A DE
21.	III B.Sc. Chemistry	Representative	A X hand
	Department of Chemistry,	1 copresentative	





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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	, Anathreet

Date: 01/12/2022



(Dr. M. SUGANTHI)
End Chairman/HoD
Espartment of Chemistry
Dr. N. G. P. Arts and Science College
Coimbatore — 641 048

