Department of Chemistry

Board of Studies Meeting

The minutes of the 16th meeting of Board of Studies held on 07.11.2024 at 9.30 am at the A1-Block-Room number-411.

Members Present:

S. No.	Name	Category
1	Dr. R. Ravikumar, Associate Professor & Head i/c	Chairman
2	Dr. R. Prabhakaran, Associate Professor, Bharathiar University, Coimbatore	University Nominee
3	Ms. S. Niveditha	Alumni
4	Dr. M. Suganthi	Member
5	Dr. M.R. Ezhilarasi	Member
6	Dr. J. Saranya	Member
7	Dr. M. Dinesh kumar	Member
8	Dr. P. Kavitha	Member
9	Dr. R. Menaka	Member
10	Dr. V. Nijarubini	Member
11	Dr. R. Rajkumar	Member
12	Dr. M. Mohanraj	Member
13	Dr. N. Kuppuchamy	Co-opted Member
14	Dr. A. Hazel Verbina	Co-opted Member
15	Dr. K.Girija	Co-opted Member
16	Dr. R. Sowrirajan	Co-opted Member
17	Dr. D. Sridevi	Co-opted Member
18	Dr. J. Rengaramanujam	Co-opted Member

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19	Dr. V. Kavitha	Co-opted Member
20	Ms. M. Varshini	Student Representative- UG
21	Ms. S. Miruthula	Student Representative- PG

The HoD and Chairman of the Department of Chemistry welcome and introduced all the members and appreciated them for their continuous support and contribution for the development of academic standard and enrichment of the syllabus.

Further Chairman informed the inability of the following member/s to attend the meeting and requested to grant leave of absence.

1. Dr. Shubhashini K Sripathi - Subject Expert
   Professor, Avinashilingam University, Coimbatore
2. Prof. R. Nandhakumar, Professor, Karunya Institute of Technology and Sciences (Deemed to be University), Coimbatore
3. Mr. E. Muthusamy, Priyadarshini Chemicals. Pvt. Ltd. Nava India, Coimbatore

After brief discussion the items of the agenda were taken one by one for discussion and the following resolutions were passed.

Item 16.1: *To review and approve the minutes of the previous meeting held on* ***06.04.2024.***

The Chairman of the board presented the minutes of the previous meeting held on **06.04.2024** and requested the members to approve. After brief discussion the following resolution was passed.

Resolution:

Resolved to approve the minutes of the previous meeting held on 06.04.2024.

Item 16.2: *To consider and approve the scheme and syllabi for II semester for the students admitted during the academic year 2024-25.*

The chairman presented the detailed Scheme and Regulation for the students admitted during the academic year 2024-25 and syllabi for the II semester. The members deliberated in detail about the modification required. After discussion, the existing syllabus is approved without any changes.

After discussion the following resolution was passed.

Resolution:

Resolved to approve the existing syllabi for the students admitted during the academic year 2024-2025.

Item 16.3: *To consider and approve the syllabi for IV semester for the students admitted during the academic year 2023-24.*

The chairman presented the detailed syllabi for IV Semester to the students admitted for the academic year 2023-24. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Changes Made:

Course Code	Course	Change and Reason
232CE1A4CB	Spectroscopy and Chromatography	The following changes have been made as per the suggestion given by subject expert Dr. R. Prabhakaran Unit II – Types of vibrational modes is added being a basic level content. Unit II - Selection rule, conformational isomers, geometrical isomers and rotational isomers are removed because of higher knowledge level contents to the UG students.

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabi for the students admitted during the academic year 2022-2023.

Item 16.4: *To consider and approve the syllabi for VI semester for the students admitted during the academic year 2022-23.*

The chairman presented the detailed syllabi for VI Semester to the students admitted for the academic year 2022-23. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

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Changes Made:

Course Code	Course	Changes and Reason
222CE1A6CB	Physical Chemistry - II	The following changes have been made as per the suggestion given by subject expert Dr. R. Prabhakaran Unit II – Spin crossover phenomena was added in order to understand other basic concepts. Unit III- Applications of enzyme catalysis was added because of its industrial importance. Unit III – BET theory and its applications was removed because of higher knowledge level contents to the UG students.
222CE1A6DC	Medicinal Chemistry	The following changes have been made as per the suggestion given by subject expert Dr. R. Prabhakaran Unit I - Drug action, Pharmacy, Pharmacology, Pharmacognosy - Pharmacophore- Pharmacodynamics- Antimetabolites – Chemotherapy - Pharmacopoeia being added as basic terminologies in medicinal chemistry. Unit I- Oxidation of olefins, benzylic C-atoms, Alicyclic C-Atoms, C-hetero atom, C-N systems were removed due to higher knowledge level of the content.

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabus for the students admitted for the academic year 2022-23.

Item 16.5: *To consider and approve the scheme and syllabi for II semester for the M. Sc students admitted during the academic year 2024-25.*

The Chairman presented the detailed scheme and syllabi for the II semester for the students admitted for the academic year 2024-25 and syllabi for the II semester. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

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Changes Made:

Course Code	Course	Reason
24CEP2CA	Stereochemistry and Pericyclic reactions	The following changes have been made as per the suggestion given by subject expert Dr. R. Prabhakaran Unit II-Addition and elimination reactions of cyclohexane was added to understand the reaction mechanism.
24CEP2DC	Organic reactions and reagents	The following changes have been made as per the suggestion given by subject expert Dr. R. Prabhakaran Unit II Alkoxy borates was added being a new class of reducing agent.

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabus for the students admitted for the academic year 2024-25.

Item 16.6: *To consider and approve the syllabi for IV semester for the M.Sc. students admitted during the academic year 2023-24.*

The chairman presented the detailed syllabi for IV Semester to the students admitted for the academic year 2023-24. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Course Code	Course	Changes and Reason
232CE2A4CA	Synthetic Organic Chemistry	The following changes have been made as per the suggestion given by subject expert Dr. R. Prabhakaran Unit I – C-X changed in to C-O disconnection because X is not an appropriate symbol. Unit II – C-X changed in to C-N disconnection because the molecules dealt in the syllabus are nitrogenous in nature. Unit V - Introduction to asymmetric synthesis was added to understand the basics.

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabus for students admitted for the academic year 2023-24.

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Item 16.7: *To review and approve the inter department course for Food science and Nutrition II semester students admitted during the academic year 2024-25. To be offered during the academic year 2024-25.*

The chairman presented the Applied chemistry syllabus for students admitted during the academic year 2024-25. The members deliberated in detail about the modification required. After discussion it is unanimously decided to adopt the following changes.

Course Code	Course	Changes and Reason
24CEU2IM	APPLIED CHEMISTRY	As per the suggestion given by subject expert Dr. R. Prabhakaran syllabus has been framed newly.

After discussion the following resolution was passed.

Resolution:

Resolved to approve the above modification and adopt the revised syllabus for the students admitted for the academic year 2024-25.

Item 16.8: *To approve the panel of examiners for question paper setting, question paper scrutiny and conduct of practical and theory examinations for the even semester of the academic year 2024-25.*

The Chairman presented the panel of examiners for question paper setting, question paper scrutiny and conduct of practical and theory examinations for the Even semester of the academic year 2024-25.

Resolution:

Resolved to approve the panel of examiners for question paper setting, question paper scrutiny and conduct of practical and theory examinations for the even semester of the academic year 2024-2025.

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Item 16.9: *To consider and approve any other item brought forward by the Chairman and the members of the board.*

The chairman presented the courses offered by NPTEL that are equivalent to courses offered in V semester for UG and III Semester for PG for approval for equivalency.

Resolution:

Resolved to approve the NPTEL courses offered in V semester for UG and III Semester for PG for equivalency.

Finally, the Chairman thank all the members for their cooperation and contribution in enriching the syllabi with active participation in the meeting and sought the same spirit in the future also. The meeting was closed with formal vote of thanks proposed by Dr.R.Ravikumar, Head i/c and Chairman- Chemistry.

Date: 07.11.2024

(Dr. R.Ravikumar)

BoS Chairman/HoD
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 **Board:** Chemistry

Semester: IV **Course Code/Name:** 232CE1A4CB – SPECTROSCOPY AND CHROMATOGRAPHY

Unit	Existing	Changes
I	**UV - Visible Spectroscopy** Electromagnetic radiation - Principle – Instrumentation - Selection rules - Types of electronic transitions in organic molecules - Woodward Fieser rules for calculation of λ_{max} of conjugated dienes and unsaturated carbonyl compounds. Chromophore concept - Auxochromes – Bathochromic – Hypsochromic – Hyperchromic -Hypochromic shifts. Types of absorption bands - Solvent effects - Franck - Condon principle - Applications	
2	**Infrared Spectroscopy** Principle - Instrumentation - ~~Selection rule~~ - ~~Vibrational modes of H_2O and CO_2 - Degrees of freedom~~ - Types of bands - Finger print region. Applications of IR spectra to identify – Functional groups- Hydrogen bonding – Keto-enol tautomers – ~~Conformational isomers Geometrical isomers Rotational isomers~~	Types of vibrational modes
3	**Nuclear Magnetic Resonance Spectroscopy** Principle - Instrumentation - Solvents used - Number of signals - Equivalent and non-equivalent protons - Position of signals - Chemical shift - Factors influencing chemical shifts - Peak area and proton coupling - Coupling constant - Splitting of signals. NMR spectra of simple molecules (Ethanol, Ethyl acetate, Ethylamine, Ethyl bromide, Isopropyl ketone, Acetone, Anisole, Benzaldehyde and Toluene)	
4	**Mass Spectrometry** Principle – Instrumentation - Mass spectrum - Molecular ion peak. Metastable ion peak – Isotopic ion peak. Nitrogen rule - General fragmentation modes of simple molecules (Pentane, Ethyl benzene, Acetone, Ethanol and cyclohexene). Retro -Diels Alder reaction, McLafferty rearrangement	

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5	**Chromatography** Paper chromatography - Principle - Solvents used - Development of chromatogram - Ascending, descending and radial paper chromatography - Applications Thin layer chromatography – Principle – Choice of adsorbents and solvents, preparation of TLC plates - Rf values Column chromatography - Principle - Types of adsorbents, preparation of the column, elution, column efficiency, number of theoritical plates recovery of substances and applications	

Percentage of Syllabus revised: 12%

Course Focuses on:

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

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Name of the faculty: BAS **Board:** Chemistry

Semester: VI **Course Code/Name: 222CE1A6CB – PHYSICAL CHEMISTRY - II**

Unit	Existing	Changes
I	**Chemical Kinetics** Factorsaffectingrateofareaction-Orderandmolecularity-Rateconstantdetermination of zero, first, second and third order reactions -Pseudo unimolecular reaction - Half-life of zero, first, second and third order reactions - Temperature dependence of reaction rates-Arrhenius equation. Theories of reaction rates - Collision theory - Absolute reaction rate theory - Significance of the free energy of activation and entropy of activation - Unimolecular reactions - Mechanism of Lindmann theory and Hinshelwood theory	
II	**Photochemistry** Laws of photochemistry – Grothus - Drapper law – Stark-Einstein law of photochemical equivalence – Quantum efficiency – determination of quantum efficiency – chemical actinometry – consequence of light absorption – Jablonski diagram – radiative and non-radiative transitions – photochemical reactions – kinetics of photochemical combination of H_2-Cl_2, H_2-Br_2 and decomposition of HI – Energy transfer in photochemical reactions –photosensitization - photosynthesis in plants – Theory of Fluorescence and Phosphorescence– Chemiluminescence and bioluminescence	Spin crossover phenomena
III	**Surface Chemistry -Adsorption and Catalysis** Types of adsorptions, adsorption of gases by solids. Adsorption isotherms – Freundlich, Langmuir. ~~BET theory- Application of adsorption~~. Theories of catalysis - Types of catalysis – Characteristics of catalytic reactions – Promoters – Catalytic poisoning– Autocatalysis –Negative catalysis – Intermediate Compound Formation Theory- Adsorption Theory– Enzyme catalysis–kinetics of enzyme catalysis– Michaelis Menton equation-~~applications of catalysts~~	Application of enzyme catalyst

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IV	**Solutions and Colligative Properties** Thermodynamics of ideal solutions: Ideal solutions and Raoult's law, deviations from Raoult's law – non-ideal solutions. Vapour pressure-composition and temperature composition curves of ideal and non-ideal solutions. Distillation of solutions. Lever rule. Azeotropes. Partial miscibility of liquids: Critical solution temperature; effect of impurity on partial miscibility of liquids. Immiscibility of liquids-Principle of steam distillation. Nernst distribution law and its applications Colligative properties- elevation of boiling point, depression in freezing point – Abnormal behavior of solutions of electrolyte	
V	**Phase Equilibria** Phase Rule: Concepts of phase, component and degrees of freedom, with examples. Gibb's phase rule – derivation. One-component system: Phase diagrams: Water and ~~sulphur systems~~. Two component system: (i) Simple eutectic: Lead-silver system- Formation of compound with congruent melting point: Ferric chloride – water system. Clausius - Clapeyron equations and their applications to equilibria in phase transitions. (solid – liquid, liquid – vapour, solid – vapour)	Phenol - Water system

Percentage of Syllabus revised: 5 %

Course Focuses on:

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

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Name of the faculty: BAS **Board:** Chemistry

Semester: VI **Course Code/Name: 222CE1A6DC – MEDICINAL CHEMISTRY**

Unit	Existing	Changes
I	**Drug Metabolism** Introduction-Phase-I and Phase-II -Drug metabolism-Drug biotransformation-detoxification of endogenous and exogenous complex-First pass effect-Role of Cytochrome P-450 in biotransformation-Oxidation of olefins, ~~benzylic C-atoms, Alicyclic C-Atoms, C-hetero atom, C-N systems~~	Introduction to drug metabolism. Drug action, Terminologies – Pharmacy, Pharmacology, Pharmacognosy- Pharmacophore-Pharmacodynamics-Antimetabolites – Chemotherapy – Pharmacopoeia
II	**Antipyretic Analgesics** Introduction-Classification and synthesis of Aniline and P-Amino Phenol-Salicylic acid-Quinoline derivative-Pyrazolones and Pyrazolodiones-Preparation, properties uses and mechanism of action of Aspirin, Paracetamol, Sodium salicylate	
III	**Diuretics** Introduction- Synthesis and Mode of action of Mercurial diuretics- Chlornerodrim Hg-Meralluride. Non-Mercurial -diuretics-Chlorothiazides-Methazolamide-chlorlidone-Furosemide. Structure and Mode of action of -Purine and xanthine derivatives-Osmotic diuretics	
IV	**Adrenergic Drugs** Indroduction-Classification- Synthesis and mode of action of Phentolamine-Tolazoline-Prazosin-Propranolol-Atenolol-Metoprolol-Labetolol	
V	**Cholinergic Drugs** Introduction-Classification - Synthesis and mode of action of Acetylcholine chloride-Methacholine chloride - Pilocarpine-Neostigmine bromide-pyridostigmine bromide-Endrophonium chloride-Pralidoxime chloride	

Percentage of Syllabus revised: 15 %

Course Focuses on:

☑	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 REVISION

Name of the faculty: BAS **Board:** Chemistry

Semester: IV **Course Code/Name:** 232CE2A4CA - SYNTHETIC ORGANIC CHEMISTRY

Unit	Existing	Changes
I	**Introduction to Retrosynthesis** Synthon, synthetic equivalent, target molecule, electron donors (nucleophiles), electron acceptors (electrophiles), functional group interconversion, disconnection approach, importance of the order of events in organic synthesis. Chemo selectivity, one group C-C and ~~C–X~~ disconnection (disconnection of alcohols and carbonyl compounds)	C-O
II	**Two group C-C & ~~C–X~~ Disconnections** 1,3 and 1,5 difunctionalized compounds, α, β-Unsaturated carbonyl compounds, control in carbonyl condensation, synthesis of 3, 5 and 6 membered rings in organic synthesis. Diels- Alder reaction. Retrosynthesis of 5 and 6 membered heterocycles containing two nitrogens. Designing synthesis: Disconnection approach in Ibuprofen, Rosiglitazone and captopril	C-N
III	**Protection and Deprotection Chemistry** Need for protection and deprotection of functional groups during chemical reactions. Protection and cleavage of hydroxyl groups (by ethers) - Methoxymethyl ether (MOM), Tetrahydropyranyl (THP) and protection and cleavage of hydroxyl groups (by esters) - Trichloroacetate and 2,4,6-trimethylbenzoate. Protection and cleavage of 1,2 and 1,3-diols - Methylene dioxy derivative - Methoxy methyleneacetal, ethyledineacetal. Protection and cleavage of Amino groups - Butoxy Carbonylation (BOC), Fluorenyl Methoxy Carbonyl (FMOC), N-Acetylation	

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IV	**Name Reactions in Organic Synthesis** Bamford, Stevens reaction, McCombie reaction (Barton Deoxygenation), Corey-Chaykovsky reaction, Hosomi-Sakurai reaction, Suzuki coupling, Nazarov cyclization - Weinreb ketone synthesis - Yamaguchi macrolactonization - McMurry reaction - Palladium based reactions: Negishi-Kumada - Fukuyama coupling - Tsuji-Trost reaction	
V	**Asymmetric Synthesis** Asymmetric synthesis and control of stereochemistry. Resolution - Enzymatic resolution and chiral chromatography, chiral pool. Methods of asymmetric induction – Substrate, reagent and catalyst-controlled reactions. Determination of enantiomeric and diastereomeric excess, enantio-discrimination	**Introduction to asymmetric synthesis**

Percentage of Syllabus revised: 2%

Course Focuses on:

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

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Name of the faculty: BAS Board: Chemistry

Semester: II Course Code/Name:

24CEP2CA- 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	
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. Conformation and reactivity of cyclohexane derivatives. Conformation of decalins	**Addition and elimination reactions of cyclohexane**
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-Buchi reaction – Photo-Fries rearrangement – Photochemistry of alkenes, dienes and aromatic compounds – di- π-methane rearrangement – Barton reaction	
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	

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V	**Molecular Rearrangements** Classification – Mechanism and applications of Wagner - Meerwein, Neber, Baeyer–Villiger, Dienone phenol, Favorski, Benzidine, Stevens, Schmidt, Lossen and Wallach rearrangements	

Percentage of Syllabus revised: 2 %

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Name of the faculty: BAS **Board:** Chemistry

Semester: II **Course Code/Name: 24CEP2DC - Organic Reactions and Reagents**

Unit	Existing	Changes
I	**Reagents in Oxidation Reactions** Chromium oxidant - Pyridinium chlorochromate (PCC), pyridinium dichromate (PDC), Chromium trioxide (CrO3), Chromic acid, Jones reagent, Manganese oxidant - KMnO4, MnO2 - Peracids - Alkenes, ketones and heterocycles, singlet oxygen, ozone, OsO4, HIO4, Ag2O, Bio-oxidations - Bacterium acetic, invertase, putida, Micrococcus sp, gibberella, treptomyces	
II	**Reagents in Reduction Reactions** Palladium/Platinum/Nickel based heterogeneous catalysts for hydrogenation, Wilkinson's catalyst, Noyori asymmetric hydrogenation – Reductions using Lithium / Sodium /Calcium in liquid ammonia. Metal hydrides - LiAlH4, NaBH4, NaBH3CN - Hydrazine, tin hydrochloride, NaHSO3, NaSH, Luche reduction	**Alkoxy borates**
III	**Name Reactions and their Applications - I** Jacobsen epoxidation, Shi epoxidation, Suzuki coupling, Heck reaction, Sonogashira reaction, Wacker process, Stille Coupling. Multicomponent reactions: Strecker synthesis, Hantszch pyridine synthesis, Biginelli synthesis. Multicomponent reactions using alkyl isocyanides: Passerini and Ugi-4-component synthesis	
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, Leukart reaction, Willegerodt - Kindler reaction	
V	**Reagents and their Applications** Preparation and synthetic application of Lipoteichoic acid (LTA), Lithium diisopropylamide (LDA), dicyclohexyl carbodiimide (DCC), 2,3-Dichloro-5,6-dicyano-1,4-benzoquinone (DDQ), TMS-iodide, TMS-cyanide, TBDMS Chloride, 1,3-Dithiane (reactivity and umpolung), Merrifield resin, Baker's yeast	

Percentage of Syllabus revised: 1%

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Name of the faculty: BAS **Board:** Chemistry

Semester: II **Course Code/Name:** 24CEU2IM – APPLIED CHEMISTRY

Unit	Existing	Changes
I	**Water** Sources and impurities, water quality parameters: Definition and significance of color, odour, turbidity, pH, hardness, alkalinity, TDS (Total Dissolved Solids), COD (Chemical Oxygen Demand) and BOD (Biological Oxygen Demand), fluoride and chloride. Municipal water treatment: Primary treatment and disinfection (UV, Ozonation, break - point chlorination). Desalination of brackish water: Reverse Osmosis 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	**Water Chemistry in Food** Water as a Universal Solvent - Role in cooking, hydration, and food preservation. Solubility - Factors affecting solubility (temperature, type of solute). Acid-Base reactions in cooking - Neutralization - Examples from everyday cooking. 1. Solubility Experiment: Test salt and sugar's solubility in cold and hot water. 2. Boiling Point Elevation: Add salt to boiling water and observe the change in boiling point. Neutralization: Mix vinegar (acid) and baking soda (base) to observe the neutralization reaction.
II	**Amino acids, Proteins and Peptides** Amino acids – Classification, zwitter ions – Peptides - Structure of proteins – Primary, secondary, tertiary and quaternary structure - Colour test for proteins. Denaturation of proteins 4. Identification of amino acids by paper chromatography 5. Colour test for proteins - Biuret test and Xanthoproteic test.	**Nutrients and Their Chemical Properties** Carbohydrates - Types, simple vs. complex carbohydrates, and their sources. Proteins - Role of amino acids - Sources of protein. Fats and Oils: Differences between saturated and unsaturated fats - Role in the body. Vitamins and Minerals - Chemical properties and importance. 3. Testing for Nutrients: Simple food tests: a. Starch Test: Iodine solution to detect starch in potatoes or bread. b. Protein Test: Biuret solution to check for proteins in milk or egg whites. c. Fat Test: Paper test to see the presence of fat in butter or oil. d. Sugar Test: Benedict's solution to test for simple sugars in fruit juice

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III	**Basic Organic Chemistry I** Nomenclature - Preparation -Physical and chemical properties of ethanol, phenol, acetaldehyde, benzaldehyde, aldehyde, acetophenone, benzophenone 6. Test for Phenols 7. Test for aldehyde and ketone	**Food Preservation and Safety** Role of Preservatives - Chemical preservatives - Salt, sugar, and vinegar - Effect on microbes. Fermentation - Chemical process - Importance in food - Yogurt and bread. Food Contamination - Safe handling of food chemicals - Understanding food labels 4. Pickling: Preserve vegetables using salt and vinegar and observe how it prevents spoilage. 5. Fermentation Experiment: Make simple bread dough with yeast and observe gas production. pH Testing: Use pH paper to measure the pH of various food items (vinegar, milk, and lemon juice).
IV	**Processing of Milk** Milk: General composition of milk - Physical properties of milk - Reeknagel effect viscosity and conductivity - Processing of milk - Boiling - Pasteurization - Sterilization and homogenization – Adulterants – Detection of preservatives and neutralizers - Estimation of calcium and fat 8.Estimation of calcium in milk powder 9. Estimation of iodine in common salt	**Food Additives and Their Chemical Nature** Types of Food Additives: Natural vs. synthetic - Examples of preservatives, colorants, and flavor enhancers. Chemistry of Flavors - Influence of chemicals on taste and aroma. Antioxidants - Role in food preservation and health. 6. Color in Foods: Use natural dyes from beetroot or turmeric and observe color changes in different pH. 7. Flavor Extraction: Make a simple vanilla extract using vanilla beans and alcohol. Preservation Experiment: Compare the preservation of fruit with and without chemical preservatives (citric acid).

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V	**Monosaccharide** Classification – Occurrence – Preparation - Structural elucidation - Properties of Glucose and Fructose 10. Estimation of glucose 11. Analysis of simple mono saccharides	**Environmental Chemistry in Food Science** Impact of agricultural chemicals - Fertilizers, pesticides, and their chemical nature. Sustainable food chemistry - Organic vs. conventional farming. Packaging and Chemical Safety - Plastics, biodegradable options, food-grade chemicals. 8. Biodegradable Experiment: Observe the decomposition of organic vs. plastic materials over time. Label Reading: Study food labels for preservatives and additives and discuss their chemical safety.

Percentage of Syllabus revised: 100 %

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ATTENDANCE OF THE SIXTEENTH BOARD OF STUDIES MEETING

Faculty: Basic and Applied Science **Board: Chemistry**

S. No	Name	Designation	Signature
1.	**Dr. R. RAVIKUMAR** Associate Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48	Chairman	07/11/24
2.	**Dr. R. PRABHAKARAN** Associate Professor, Department of Chemistry, Bharathiar University, Coimbatore-46	Vice Chancellor Nominee	07/11/2024
3.	**Prof. R. NANDHAKUMAR** Professor of Applied Chemistry, School of Sciences Karunya Institute of Technology and Sciences, Coimbatore-114	Subject Expert	ABSENT
4.	**Dr. SUBHASHINI K SRIPATHI,** Professor of Chemistry, School of Physical Sciences and Computational Sciences, Avinashilingam University, Coimbatore-43	Subject Expert	ABSENT
6.	**Mr. E. MUTHUSAMY** Priyadharshini Chemicals Pvt.Ltd, Nava India, Coimbature-06.	Industry Expert	ABSENT
7.	**Ms. S. NIVEDITHA** Proprietor, Swathi Scientific Solutions, Kaniyur, Coimbatore-59.	Alumni	7/11/24
8.	**Dr. M. R. EZHILARASI** Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	7/11/2024
9.	**Dr. M. SUGANTHI** Associate Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	07.11.2024
10.	**Dr. J. SARANYA** Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	7/11/24
11.	**Dr. M. DINESHKUMAR** Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	7/11/2024
12.	**Dr. P. KAVITHA** Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	7/11/24
13.	**Dr. R. MENAKA** Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	7/11/2024

14.	**Dr. V. NIJARUBINI** Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
15.	**Dr. R. RAJKUMAR** Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
16.	**Dr. M. MOHANRAJ** Assistant Professor, Department of Chemistry, Dr. N.G.P Arts & Science College, Coimbatore-48.	Internal Member	
17.	**Dr. N. KUPPUCHAMY** Professor & Head, Department of Tamil, Dr. N.G.P Arts & Science College, Coimbatore-48.	Co-opted member	
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