CHEMISTRY- ALLIED SYLLABUS (2018- 2021)

SEMESTER- I

ALLIED CHEMISTRY – I

SUBJECT CODE: SACH11

L	T	P	C
4	0	0	3

Objectives

To learn about atomic structure and bonding.

To learn the principles of reactions of organic compounds.

To study about photochemical reactions. To learn about the importance of polymers and polymer science.

To study about lubricants and some cosmetics in the modern world.

Unit I – Inorganic Chemistry(11 hrs)

Atomic structure: electronic configuration - Aufbau principle - Pauli's exclusion principle. Hund's rule. Bonding: electrovalent, covalent, hydrogen bonds-orbital overlap - s-s, s-p. Hybridization and VESPR theory - CH_4, C_2H_4, C_2H_2- $BeCl_2$, BF_3, NH_3, H_2O, PCl_5, IF_5, IF_7.

Unit II - Organic Chemistry(13hrs)

Principles of reactions Heterolytic and homolytic cleavage - nucleophiles and electrophiles-reaction intermediates – preparation and properties of carbonium ions, carbanions and free radicals -type of reactions - substitution, addition, elimination and polymerisation reactions.

Unit III-Physical Chemistry (11hrs)

Photochemistry Definition-comparison between thermal and photochemical reactions-Laws of photochemistry-Beer Lambert'sLaw-Growth's Draper law-Einstein's law-Quantum yield-low and high quantum yield-determination of quantum yield-fluorescence, phosphorescence, thermoluminescence, chemiluminescence and bioluminescence-definition with examplesphotosensitisation.

Unit IV-Polymer Chemistry (13 hrs)

Definition- Monomers, Oligomers and Polymers - Classification of polymers- natural, syntheticlinear, cross linked and network- plastics, elastomers, fibres- homopolymers and co-polymers Thermoplastics: polyethylene, polypropylene, polystyrene, polyacrylonitrile, poly vinyl chloride, nylon and polyester - Thermosetting Plastics: phenol formaldehyde and epoxide resin. Elastomers: natural rubber and synthetic rubber - Buna - N, Buna-S and neoprene.

Unit V-Applied Chemistry (12 hrs)

Lubricants-classification-criteria of good lubricating oils-synthetic lubricating oils-poly glycols and poly alkene oxides-greases or semi solid lubricants-examples-solid

lubricantsgraphite.Preparation and uses of shampoo, nail polish, sun screens, tooth powder, tooth paste, boot polish, moth ball and chalk piece.

Reference Books

1. B. R. Puri, L. R. Sharma and K. C. Kalia, Principles of Inorganic Chemistry
2. P. L. Soni, Text Book of Inorganic Chemistry
3. K. S. Tewari and N. K. Vishnoi, A Text Book of Organic Chemistry.
4. Arun Bahl and B.S. Bahl, Advanced Organic Chemistry, S. Chand and Sons.
5. M.K. Jain and S. C. Sharma, Modern Organic Chemistry
6. K.K.Rohatgi Mukherjee, Fundamentals of photochemistry, Wiley Eastern Ltd.
7. B.R. Puri and L.R. Sharma, Principles of Physical Chemistry, Chand & Co.
8. Malcom P. Stevens, Polymer Chemistry – An Introduction
9. V.R. Gowariker, Polymer Science, Wiley Eastern, 1995.
10. Sawyer, Experimental cosmetics, Dover publishers, New York, 2000.

Allied Chemistry Practical - I

Inorganic Quantitative Analysis

SUBJECT CODE: SACHP1

L	T	P	C
0	0	2	2

Objective:

To enable the students to acquire the quantitative skills in volumetric analysis.

Acidimetry and alkalimetry

1. Estimation of oxalic acid – Std. oxalic acid

2. Estimation of Na_2CO_3 – Std. Na_2CO_3

3. Estimation of hydrochloric acid – Std. oxalic acid

Permanganometry

4. Estimation of ferrous ammonium sulphate – Std. ferrous ammonium sulphate

5. Estimation of oxalic acid – Std. oxalic acid

6. Estimation of ferrous sulphate – Std. oxalic acid

Internal –50 marks

25 marks - Regularity

25 marks – Average of best six estimations in regular class work

External -50 marks

10 marks – Record (atleast six volumetric estimations)*

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded (Students having a bonafide record only should be permitted to appear for the practical examination)

SEMESTER-II

ALLIED CHEMISTRY –II

SUBJECT CODE: SACH21

L	T	P	C
3	0	0	3

Objective

To learn the chemistry of basic aromatic compounds.

To understand the nuclear particles and few nuclear reactions

To know about carbohydrates, amino acids, proteins and nucleic acid.

To study about fuels, fertilizers, cement and glass.

To know about some common diseases and the drugs used.

UNIT 1

ORGANIC CHEMISTRY (11 hrs)

Aromatic compounds General characteristics of aromatic compounds - aromaticity – Huckell's rule with examples- non – benzenoid aromatic compounds (definition and examples only) Preparation, properties and structure of benzene, naphthalene and anthracene.

UNIT 2

PHYSICAL CHEMISTRY (13 hrs)

Nuclear chemistry nuclear stability – n/p ratio – packing fraction – mass defect – binding energy - isotopes, isobars, isotones with examples. Separation of isotopes by diffusion method – group displacement law - radioactive series - nuclear fission, fusion - Application of radio isotopes (radio diagnosis and therapy, C-14 dating).

UNIT 3

BIO CHEMISTRY (11 hrs)

Carbohydrates –definition and classification – artificial synthetic sweeteners. Amino acids - classification – amphoteric nature – isoelectric point. Proteins - classification according to composition, solubility and shape - colour reactions - biological action. Nucleic acids – purines, pyrimidines, nucleosides, nucleotides – DNA – structure of DNA – RNA - different types of RNA

UNIT 4

INDUSTRIAL CHEMISTRY (13 hrs)

Fuel gases – Water gas, Producer gas, L.P.G, Gobar gas and Natural gas. Fertilizers – N.P.K and mixed fertilizers. Soaps and detergents – an elementary idea of soaps and detergents.

Cleansing action of soaps and detergents. Cement and glass: Portland cement-manufacture only. Manufacture of glass- types and uses borosilicate's -photochromic and safety glass.

UNIT-5

PHARMACEUTICAL CHEMISTRY (21 hrs)

Common diseases – infective diseases – insect borne –air borne – water borne – hereditary diseases. Definition and examples of analgesics, antipyretics, sulpha drugs, antimalarials and, antibiotics. Diabetes – causes – hyper and hypoglycaemic drugs. Indian medicinal plants – Tulsi, neem, keezhanelli- their importance

Reference Books

1. Puri, Sharma & Kalia, Principles of Inorganic Chemistry, Milestone Publishers and Distributors, 2008.

2. P.L. Soni, Text book of Inorganic Chemistry, Sultan Chand and Sons, 2007.

3. Bahl and Arun Bahl, Organic Chemistry, S. Chand and Sons, New Delhi, 2005.

4. Morrison & Boyd, Organic Chemistry, VIthedition, Prentice Hall of India Pvt. Ltd., New Delhi, 1998.

5. P. L. Soni, Text book of Organic Chemistry, S. Chand and Company Ltd., New Delhi.

Allied Chemistry Practical - II

Inorganic Qualitative Analysis

SUBJECT CODE: SACHP2

L	T	P	C
0	0	2	2

Objective

Inorganic simple salt containing one acidic radical (interfering radical) and one basic radical

1.Acidic radical Interfering acidic radicals: Borate, Fluoride, Oxalate and Phosphate.

2. Basic radicals

Group I: Lead

Group II: Copper, Cadmium

Group IV: Cobalt, Nickel

Group V: Barium, Strontium

Group VI: Ammonium.

Internal –50 marks

25 marks – Regularity

25 marks – Average of four experiments in regular class work

External -50 marks

10 marks – Record (atleast 4 experiments) *

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded (Students having a bonafide record only should be permitted to appear for the practical examination)

SEMESTER- III

NON-MAJOR ELECTIVE

FOOD SCIENCE

SUBJECT CODE: SNCH3A

L	T	P	C
2	0	0	2

Objectives:

To acquire the basic knowledge of food science

UNIT – I INTRODUCTION (6 Hrs)

Food: sources and classification – food as a source of energy - functions andbiological importance of carbohydrates, protein, fat, vitamins and minerals - calorific value offood – energy requirements of individuals - balanced diet.

UNIT - II FOOD ADDITIVES (6 Hrs)

Definition, food colourants: natural and artificial - antioxidants, stabilizers, flavours,bleaching and maturing agents – leavening agents.

UNIT - III FOOD PRESERVATIVES (5 Hrs)

Definition - classification - methods of food preservation and processing by heat,cold, radiation, drying and deep freezing.

UNIT - IV FOOD ADULTERATION (6 Hrs)

Definition – types – detection and analysis of adulterants in foods: milk, chillipowder, coffee powder, turmeric powder, ghee, oil and pulses.

UNIT -V QUALITY STANDARDS (7 Hrs)

Quality control - specification and standards - FA, WHO standards – packing andlabelling of foods, Essential Commodities Act - Consumer Protection Act - AGMARK.

Text books:

1. Sivasankar B, Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, NewDelhi, 2002.

2. Swaminathan M. Textbook on Food Chemistry, Printing and Publishing Co, Ltd,Bangalore 1993.

Reference books:

1. Food Science – III Edition – Sri Lakshmi B, New Age International Publisher, 2005.

2. Fundamentals of Foods and Nutrition – Mudambi. R. Sumathi, and Rajagopal, M.V. - Willey Eastern Ltd, Madras.

SEMESTER- IV

NON-MAJOR ELECTIVE

APPLIED CHEMISTRY

SUBJECT CODE: SNCH4B

L	T	P	C
2	0	0	2

Objectives:

To acquire knowledge about the chemicals used in day-to-day life.

UNIT I - SOAPS AND DETERGENTS (5 Hrs)

Soaps: Definition-classification-raw materials used in the manufacture of soap –manufacture of toilet soap.

Detergents: Definition –various types with examples- advantages of detergents over soaps – cleansing action of soap.

UNIT II- FERTILIZERS (6 Hrs)

Definition-characteristics of a good fertilizer- role of nitrogen, potassium and phosphorous inplant growth – natural fertilizers- chemical fertilizers: urea, muriate of potash and triplesuperphosphate - mixed fertilizers - biofertilizers – advantages of biofertilizers.

UNIT III - POLYMERS (7 Hrs)

Fibers: Classification –uses of terylene, nylon and orlon.

Resins: Natural resins- synthetic resins-type-uses of fevicol, quick fix, araldite, glyptal and Bakelite.

Plastics: classification- differences between thermoplasts and thermosets. Advantages of plastics-uses of polythene, PVC, polystyrene, Teflon and thermocole.

Rubber: Types-defects in natural rubber-vulcanization-synthetic rubbers- uses of neoprene, thiocol, butyl rubber, silicone rubber and foam rubber.

UNIT IV - CHEMICALS IN PHARMACY (7 Hrs)

Definition and therapeutic uses of the following (an elementary study only)

Antiseptics: alum, boric acid

Mouth washes: Hydrogen peroxide

Antacids: Aluminium hydroxide

Analgesics: Aspirin, paracetamol

Antibiotics: Penicillin’s, tetracyclines

Haematinics: Ferrous fumarate, ferrous gluconate

Laxatives: Epsom salt, milk of magnesia

Sedatives: Diazepam

UNIT V - CHEMICALS IN DAY-TO-DAY LIFE (5 Hrs)

An outline of the preparation and uses of the following articles.

Tooth powder, tooth paste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, phenyl and moth balls.

Text books:

1. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.

2. Jeyashree Gosh, A text book of Pharmaceutical Chemistry, S. Chand and Company, New Delhi.

Reference books:

1.B. N. Chakrabarty, Industrial Chemistry, Oxford and IBH Publishing Co. Pvt.Ltd., Calcutta.

CHEMISTRY- ALLIED SYLLABUS (2021- 2022)

SEMESTER- I

ALLIED CHEMISTRY – I

SUBJECT CODE: AACH11

L	T	P	C
4	0	0	3

Objectives

To learn about atomic structure and bonding.

To learn the principles of reactions of organic compounds.

To study about photochemical reactions. To learn about the importance of polymers and polymer science.

To study about lubricants and some cosmetics in the modern world.

Unit I – Inorganic Chemistry (11 hrs)

Atomic structure: electronic configuration - Aufbau principle - Pauli's exclusion principle. Hund's rule. Bonding: electrovalent, covalent, hydrogen bonds-orbital overlap - s-s, s-p. Hybridization and VESPR theory - CH_4, C_2H_4, C_2H_2- $BeCl_2$, BF_3, NH_3, H_2O, PCl_5, IF_5, IF_7.

Unit II - Organic Chemistry(13hrs)

Principles of reactions Heterolytic and homolytic cleavage - nucleophiles and electrophiles-reaction intermediates – preparation and properties of carbonium ions, carbanions and free radicals -type of reactions - substitution, addition, elimination and polymerisation reactions.

Unit III-Physical Chemistry (11hrs)

Photochemistry Definition-comparison between thermal and photochemical reactions-Laws of photochemistry-Beer Lambert's Law-Growth's Draper law-Einstein's law-Quantum yield-low and high quantum yield-determination of quantum yield-fluorescence, phosphorescence, thermoluminescence, chemiluminescence and bioluminescence-definition with examplesphotosensitisation.

Unit IV - Polymer Chemistry (13 hrs)

Definition- Monomers, Oligomers and Polymers - Classification of polymers- natural, syntheticlinear, cross linked and network- plastics, elastomers, fibres- homopolymers and co-polymers Thermoplastics: polyethylene, polypropylene, polystyrene, polyacrylonitrile, poly vinyl chloride, nylon and polyester - Thermosetting Plastics: phenol formaldehyde and epoxide resin. Elastomers: natural rubber and synthetic rubber - Buna - N, Buna-S and neoprene.

Unit V - Applied Chemistry (12 hrs)

Lubricants-classification-criteria of good lubricating oils-synthetic lubricating oils-poly glycols and poly alkene oxides-greases or semi solid lubricants-examples-solid lubricantsgraphite. Preparation and uses of shampoo, nail polish, sun screens, tooth powder, tooth paste, boot polish, moth ball and chalk piece.

Reference Books

1. B. R. Puri, L. R. Sharma and K. C. Kalia, Principles of Inorganic Chemistry
2. P. L. Soni, Text Book of Inorganic Chemistry
3. K. S. Tewari and N. K. Vishnoi, A Text Book of Organic Chemistry.
4. Arun Bahl and B.S. Bahl, Advanced Organic Chemistry, S. Chand and Sons.
5. M.K. Jain and S. C. Sharma, Modern Organic Chemistry
6. K.K.Rohatgi Mukherjee, Fundamentals of photochemistry, Wiley Eastern Ltd.
7. B.R. Puri and L.R. Sharma, Principles of Physical Chemistry, Chand & Co.
8. Malcom P. Stevens, Polymer Chemistry – An Introduction
9. V.R. Gowariker, Polymer Science, Wiley Eastern, 1995.
10. Sawyer, Experimental cosmetics, Dover publishers, New York, 2000.

Allied Chemistry Practical - I

Inorganic Quantitative Analysis

SUBJECT CODE: AACHP1

L	T	P	C
0	0	2	2

Objective:

To enable the students to acquire the quantitative skills in volumetric analysis.

Acidimetry and alkalimetry

1. Estimation of oxalic acid – Std. oxalic acid

2. Estimation of Na_2CO_3 – Std. Na_2CO_3

3. Estimation of hydrochloric acid – Std. oxalic acid

Permanganometry

4. Estimation of ferrous ammonium sulphate – Std. ferrous ammonium sulphate

5. Estimation of oxalic acid – Std. oxalic acid

6. Estimation of ferrous sulphate – Std. oxalic acid

Internal –50 marks

25 marks - Regularity

25 marks – Average of best six estimations in regular class work

External -50 marks

10 marks – Record (atleast six volumetric estimations) *

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded (Students having a bonafide record only should be permitted to appear for the practical examination)

SEMESTER-II

ALLIED CHEMISTRY –II

SUBJECT CODE: AACH21

L	T	P	C
3	0	0	3

Objective

To learn the chemistry of basic aromatic compounds.

To understand the nuclear particles and few nuclear reactions

To know about carbohydrates, amino acids, proteins and nucleic acid.

To study about fuels, fertilizers, cement and glass.

To know about some common diseases and the drugs used.

UNIT 1

ORGANIC CHEMISTRY (11 hrs)

Aromatic compounds General characteristics of aromatic compounds - aromaticity – Huckell's rule with examples- non – benzenoid aromatic compounds (definition and examples only) Preparation, properties and structure of benzene, naphthalene and anthracene.

UNIT 2

PHYSICAL CHEMISTRY (13 hrs)

Nuclear chemistry nuclear stability – n/p ratio – packing fraction – mass defect – binding energy - isotopes, isobars, isotones with examples. Separation of isotopes by diffusion method – group displacement law - radioactive series - nuclear fission, fusion - Application of radio isotopes (radio diagnosis and therapy, C-14 dating).

UNIT 3

BIO CHEMISTRY (11 hrs)

Carbohydrates –definition and classification – artificial synthetic sweeteners. Amino acids - classification – amphoteric nature – isoelectric point. Proteins - classification according to composition, solubility and shape - colour reactions - biological action. Nucleic acids – purines, pyrimidines, nucleosides, nucleotides – DNA – structure of DNA – RNA - different types of RNA

UNIT 4

INDUSTRIAL CHEMISTRY (13 hrs)

Fuel gases – Water gas, Producer gas, L.P.G, Gobar gas and Natural gas. Fertilizers – N.P.K and mixed fertilizers. Soaps and detergents – an elementary idea of soaps and detergents. Cleansing action of soaps and detergents. Cement and glass: Portland cement-manufacture only. Manufacture of glass- types and uses borosilicate's -photochromic and safety glass.

UNIT-5

PHARMACEUTICAL CHEMISTRY (21 hrs)

Common diseases – infective diseases – insect borne –air borne – water borne – hereditary diseases. Definition and examples of analgesics, antipyretics, sulpha drugs, antimalarials and, antibiotics. Diabetes – causes – hyper and hypoglycaemic drugs. Indian medicinal plants – Tulsi, neem, keezhanelli- their importance

Reference Books

1. Puri, Sharma & Kalia, Principles of Inorganic Chemistry, Milestone Publishers and Distributors, 2008.

2. P.L. Soni, Text book of Inorganic Chemistry, Sultan Chand and Sons, 2007.

3. Bahl and Arun Bahl, Organic Chemistry, S. Chand and Sons, New Delhi, 2005.

4. Morrison & Boyd, Organic Chemistry, VIth edition, Prentice Hall of India Pvt. Ltd., New Delhi, 1998.

5. P. L. Soni, Text book of Organic Chemistry, S. Chand and Company Ltd., New Delhi.

Allied Chemistry Practical - II

Inorganic Qualitative Analysis

SUBJECT CODE: AACHP2

L	T	P	C
0	0	2	1

Objective

Inorganic simple salt containing one acidic radical (interfering radical) and one basic radical

1.Acidic radical Interfering acidic radicals: Borate, Fluoride, Oxalate and Phosphate.

2. Basic radicals

Group I: Lead

Group II: Copper, Cadmium

Group IV: Cobalt, Nickel

Group V: Barium, Strontium

Group VI: Ammonium.

Internal –50 marks

25 marks – Regularity

25 marks – Average of four experiments in regular class work

External -50 marks

10 marks – Record (atleast 4 experiments) *

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded (Students having a bonafide record only should be permitted to appear for the practical examination)

SEMESTER- III

NON-MAJOR ELECTIVE

FOOD SCIENCE

SUBJECT CODE: ANCH31

L	T	P	C
2	0	0	2

Objectives:

To acquire the basic knowledge of food science

UNIT – I INTRODUCTION (6 Hrs)

Food: sources and classification – food as a source of energy - functions andbiological importance of carbohydrates, protein, fat, vitamins and minerals - calorific value offood – energy requirements of individuals - balanced diet.

UNIT - II FOOD ADDITIVES (6 Hrs)

Definition, food colourants: natural and artificial - antioxidants, stabilizers, flavours,bleaching and maturing agents – leavening agents.

UNIT - III FOOD PRESERVATIVES (5 Hrs)

Definition - classification - methods of food preservation and processing by heat,cold, radiation, drying and deep freezing.

UNIT - IV FOOD ADULTERATION (6 Hrs)

Definition – types – detection and analysis of adulterants in foods: milk, chillipowder, coffee powder, turmeric powder, ghee, oil and pulses.

UNIT -V QUALITY STANDARDS (7 Hrs)

Quality control - specification and standards - FA, WHO standards – packing andlabelling of foods, Essential Commodities Act - Consumer Protection Act - AGMARK.

Text books:

1. Sivasankar B, Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, NewDelhi, 2002.

2. Swaminathan M. Textbook on Food Chemistry, Printing and Publishing Co, Ltd,Bangalore 1993.

Reference books:

1. Food Science – III Edition – Sri Lakshmi B, New Age International Publisher, 2005.

2. Fundamentals of Foods and Nutrition – Mudambi. R. Sumathi, and Rajagopal, M.V. - Willey Eastern Ltd, Madras.

SEMESTER- IV

NON-MAJOR ELECTIVE

APPLIED CHEMISTRY

SUBJECT CODE: ANCH42

L	T	P	C
2	0	0	2

Objectives:

To acquire knowledge about the chemicals used in day-to-day life.

UNIT I - SOAPS AND DETERGENTS (5 Hrs)

Soaps: Definition-classification-raw materials used in the manufacture of soap –manufacture of toilet soap.

Detergents: Definition –various types with examples- advantages of detergents over soaps – cleansing action of soap.

UNIT II- FERTILIZERS (6 Hrs)

Definition-characteristics of a good fertilizer- role of nitrogen, potassium and phosphorous inplant growth – natural fertilizers- chemical fertilizers: urea, muriate of potash and triplesuperphosphate - mixed fertilizers - biofertilizers – advantages of biofertilizers.

UNIT III - POLYMERS (7 Hrs)

Fibers: Classification –uses of terylene, nylon and orlon.

Resins: Natural resins- synthetic resins-type-uses of fevicol, quick fix, araldite, glyptal and Bakelite.

Plastics: classification- differences between thermoplasts and thermosets. Advantages of plastics-uses of polythene, PVC, polystyrene, Teflon and thermocole.

Rubber: Types-defects in natural rubber-vulcanization-synthetic rubbers- uses of neoprene, thiocol, butyl rubber, silicone rubber and foam rubber.

UNIT IV - CHEMICALS IN PHARMACY (7 Hrs)

Definition and therapeutic uses of the following (an elementary study only)

Antiseptics: alum, boric acid

Mouth washes: Hydrogen peroxide

Antacids: Aluminium hydroxide

Analgesics: Aspirin, paracetamol

Antibiotics: Penicillin's, tetracyclines

Haematinics: Ferrous fumarate, ferrous gluconate

Laxatives: Epsom salt, milk of magnesia

Sedatives: Diazepam

UNIT V - CHEMICALS IN DAY-TO-DAY LIFE (5 Hrs)

An outline of the preparation and uses of the following articles.

Tooth powder, tooth paste, writing inks, gum paste, boot polish, talcum powder, chalk crayons, agar battis, phenyl and moth balls.

Text books:

1. B. K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.

2. Jeyashree Gosh, A text book of Pharmaceutical Chemistry, S. Chand and Company, New Delhi.

Reference books:

1.B. N. Chakrabarty, Industrial Chemistry, Oxford and IBH Publishing Co. Pvt.Ltd., Calcutta.

CHEMISTRY- ALLIED SYLLABUS (2022- 2024)

SEMESTER- I

ALLIED CHEMISTRY – I

SUBJECT CODE: CACH11

L	T	P	C
4	0	0	3

Course Objectives

1. Explain the theories of chemical bonding and Study about the principles and types of organic reactions.

2. Understand the various states of substances and know about mostly used inorganic materials.

3. Gain the knowledge about the medicine for curing diseases

UNIT I INORGANIC CHEMISTRY (11 Hrs)

Atom: Composition – Atomic structure –Quantum numbers – Shape of atomic orbitals. Bonding: Overlapping of atomic orbitals s-s, s –p and p-p – Valence bond theory- Sigma and pi bonds – Hybridization – sp, sp^2 and sp^3 hybridisations with suitable examples. Molecules: Shape of molecules – VSEPR theory –Intermolecular forces – Hydrogen bonding. Molecular Orbital Theory (MOT): Bonding and Antibonding molecular orbitals – Bond order. MO diagrams: Homonuclear diatomic molecules (N_2, O_2 and F_2) and Heteronuclear diatomic molecule (HF).

UNIT II ORGANIC CHEMISTRY (13 Hrs)

Principles of reactions: Heterolytic and homolytic cleavage - Nucleophiles and electrophiles: Definition – Types – Examples. Organic reaction intermediates – Preparation and properties of carbonium ions, carbanions and free radicals – Order of stability of the intermediates. Types of reactions - Substitution, addition, elimination and polymerisation reactions – Illustrations with specific examples.

UNIT III PHYSICAL CHEMISTRY(11 Hrs)

Gaseous state: Postulates of kinetic theory of gases – Derivation of expression for pressure of gas on the basis of kinetic theory – Deducing the basic gas laws. Ideal and real gases- Deviation of real gases from ideal behaviour – Reasons for deviation - Derivation of Vander Waals gas equation. Liquid state: Comparison of gaseous and liquid states. Surface tension – viscosity – Trouton's rule and its significances. Solid state: Types of solids - Crystals, crystallographic systems - Conductors, insulators and semiconductors. Intrinsic and extrinsic semiconductors.

UNIT IV INDUSTRIAL CHEMISTRY (13 Hrs)

Cement: Manufacture – Wet Process and Dry process, types, analysis of major constituents, setting of cement, reinforced concrete. Glass: Composition and manufacture of glass. Types of glasses: optical glass, coloured glasses and lead glass. Chemical explosives: Preparation and chemistry of lead azide, nitroglycerine, nitrocellulose, TNT, RDX, picric acid and gunpowder.

UNIT V CHEMOTHERAPHY (12 Hrs)

Preparation, uses and mode of action of sulpha drugs - Prontosil, Sulphadiazine and Sulphafurazole. Uses of Pencillin, chloramphenicol and streptomycin - Definition with one example for analgesics, antipyretics, tranquilisers, sedatives, hypnotics, local and general anaesthetics. Cause and treatment of diabetes, cancer and AIDS.

Reference Books

1. B.R. Puri, L.R. Sharma, K. C. Kalia, Principles of Inorganic chemistry, 21st edition, Vallabh Publications, 2005.

2. B. S. Bahl and A. Bahl, Organic Chemistry, 12th edition, New Delhi, Sultan Chand & Co., 2010.

3. B.R. Puri, L.R. Sharma, Pathania, Principles of Physical chemistry, 35th edition, Shoban Lal Nagin Chand and Co., 2013.

4. B.K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut.

5. James A. Kent, Riegel's Hand Book of Industrial Chemistry, Springer Science, 2013.

6. G.R. Chatwal, Himalaya, Publishing House, New Delhi, 2002.

7. Text Book of Pharmaceutical Chemistry, Jeyashree Gosh S. Chand and company, New Delhi, 2003

Allied Chemistry Practical - I

Inorganic Quantitative Analysis

SUBJECT CODE: CACHP1

L	T	P	C
0	0	2	2

Objective:

To enable the students to acquire the quantitative skills in volumetric analysis.

Acidimetry and alkalimetry

1. Estimation of oxalic acid – Std. oxalic acid

2. Estimation of Na_2CO_3 – Std. Na_2CO_3

3. Estimation of hydrochloric acid – Std. oxalic acid

Permanganometry

4. Estimation of ferrous ammonium sulphate – Std. ferrous ammonium sulphate

5. Estimation of oxalic acid – Std. oxalic acid

6. Estimation of ferrous sulphate – Std. oxalic acid

Internal –50 marks

25 marks - Regularity

25 marks – Average of best six estimations in regular class work

External -50 marks

10 marks – Record (atleast six volumetric estimations) *

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded (Students having a bonafide record only should be permitted to appear for the practical examination)

SEMESTER-II

ALLIED CHEMISTRY –II

SUBJECT CODE: CACH21

L	T	P	C
3	0	0	3

Course Objectives

Know the importance of coordination compounds and understand the electronic effects and stereoisomerism in organic compounds.

Gain the knowledge in conductance of the solution and EMF of the cells & its applications.

Outline the importance of the Bio-molecules and various diseases & its treatment.

UNIT I INORGANIC CHEMISTRY (11 Hrs)

Coordination Chemistry: Definition of ligand and Complexes- Coordination number and valency of metal ions - IUPAC Nomenclature – Werner's, Sidgwick and Pauling's theories. Effective Atomic Number rule- Metal carbonyls. Chelation – Chelate Effect- Applications of EDTA in Qualitative and Quantitative Analysis. Biological role of haemoglobin, Vitamin B12 and Chlorophyll.

UNIT II ORGANIC CHEMISTRY (13 Hrs)

Covalent Bond-Orbital Overlap-Hybridisation – sp, sp^2, & sp^3 hybridisations – Geometry of Organic molecules- Methane, Ethylene and Acetylene. Electron displacement Effects: Inductive, Resonance, Hyper conjugative & steric effects. Their effect on the properties of compounds. Stereoisomerism: Symmetry-elements of symmetry- cause of optical activity, Tartaric acid. Racemisation. Resolution. Geometrical isomerism of Maleic and Fumaric acids.

UNIT III PHYSICAL CHEMISTRY(11 Hrs)

Electro Chemistry: Molar and equivalent conductance – Effect of dilution on conductivityOstwald dilution law - Kohlrausch law -Measurement of conductance - pH determinationConductometric titrations. Galvanic cells-EMF-standard electrode potentials-Nernst equation (derivation not required) – EMF of electrode and cell - reference electrodes – pH determination using glass electrode – Potentiometric titrations. Corrosion: Definition-Methods of prevention of corrosion.

UNIT IV BIO-ORGANICHEMISTRY (13 Hrs)

Carbohydrates: Classification and examples – Reducing and non-reducing sugars - glucose and fructose – preparation and properties –structure of glucose – Fischer and Haworth cyclic structures. Amino acids and proteins: Amino acids – Classification based on structure. Essential and non – essentials amino acids – preparation, properties and uses – peptides (elementary treatment only) – proteins – Classification based on physical properties and biological functions. Structure of proteins – primary and secondary (elementary treatment).

UNIT V PHARMACEUTICAL CHEMISTRY(12 Hrs)

Common diseases – Infective diseases – Insect borne –Air borne – Water borne – Hereditary diseases. Definition and examples of analgesics, antipyretics, sulpha drugs, antimalarials and, antibiotics. Diabetes – causes – hyper and hypoglycaemic drugs. Indian medicinal plants – Tulsi, neem, keezhanellitheir importance.

Reference Books

1. B.R. Puri, L.R. Sharma, K. C. Kalia, Principles of Inorganic chemistry, 21st edition, Vallabh Publications, 2005.

2. P. L. Soni, "Text Book of Organic Chemistry" 26th Edition, S. Chand & Co, New Delhi, 1994.

3. R.T.Morrison, R.N. Boyd, S.K Bhattacharjee, Organic Chemistry, 7th Edition, Pearson, India, 2011.

4. B.R. Puri, L.R. Sharma, Pathania, Principles of Physical chemistry, 35th edition, Shoban Lal Nagin Chand and Co., 2013.

5. Principles of Biochemistry, 6th Edition, D.L. Nelson and M.M. Cox, W. H. Freeman and company (New York).

6. G.R. Chatwal, Pharmaceutical Chemistry, Himalaya, Publishing House, New Delhi, 2002.

7. Text Book of Pharmaceutical Chemistry, Jeyashree Gosh S. Chand and Company, New Delhi, 2003.

8. S.Lakshmi, Pharmaceutical Chemistry, Sultan Chand and sons, 3rd Edition, 2004.

Allied Chemistry Practical - II

Inorganic Qualitative Analysis

SUBJECT CODE: CACHP2

L	T	P	C
0	0	2	1

Objective

Inorganic simple salt containing one acidic radical (interfering radical) and one basic radical

1.Acidic radical Interfering acidic radicals: Borate, Fluoride, Oxalate and Phosphate.

2. Basic radicals

Group I: Lead

Group II: Copper, Cadmium

Group IV: Cobalt, Nickel

Group V: Barium, Strontium

Group VI: Ammonium.

Internal –50 marks

25 marks – Regularity

25 marks – Average of four experiments in regular class work

External -50 marks

10 marks – Record (atleast 4 experiments) *

10 marks – Procedure

30 marks – Result

*Experiments done in the class alone should be recorded (Students having a bonafide record only should be permitted to appear for the practical examination)

SEMESTER- III

NON-MAJOR ELECTIVE

FOOD SCIENCE

SUBJECT CODE: CNCH31

L	T	P	C
2	0	0	2

Objectives:

To acquire the basic knowledge of food science

UNIT – I INTRODUCTION (6 Hrs)

Food: Sources and classification – Food as a source of energy - Functions and biological importance of Carbohydrates, Protein, Fat, Vitamins and Minerals - Calorific value of food – Energy requirements of individuals - Balanced Diet-Glycaemic index, Glycaemic load.

UNIT II FOOD ADDITIVES AND SPICES(6 Hrs)

Definition, Food colourants: Natural and Artificial - Antioxidants, sweetening agents, Stabilizers, Flavours, Bleaching and Maturing agents – Leavening agents. Chemistry of Spices.

UNIT III FOOD PRESERVATIVES (5 Hrs)

Definition – Principles of food Preservation - Classification - Methods of food preservation and Processing by heat, Cold, radiation, drying and deep freezing.

UNIT IV FOOD ADULTERATION (6 Hrs)

Definition – Types – Detection and Analysis of adulterants in foods: Milk, Chilli powder, Coffee powder, Turmeric powder, Ghee, Oil and Pulses.

UNIT V QUALITY STANDARDS (7 Hrs)

Quality control - Specification and Standards - FA, WHO standards – Packing and Labelling of foods, Essential Commodities Act - Consumer Protection Act - AGMARK.

Text books

1. B. Sivasankar Food Processing and Preservation, Prentice Hall of India Pvt. Ltd, New Delhi, 2002.

2. M. Swaminathan Textbook on Food Chemistry, Printing and Publishing Co, Ltd, Bangalore 1993.

Reference Books:

1. L.M. Mayer, Food chemistry, CBS, ISBN-9788123911496.

2. Food Science, 3rd Edition, B. Sri Lakshmi New Age International Publisher, 2005.

3. Fundamentals of Foods and Nutrition – R. Mudambi. Sumathi, and M.V. Rajagopal, Willey Eastern Ltd, Madras.

SEMESTER- IV

NON-MAJOR ELECTIVE

APPLIED CHEMISTRY

SUBJECT CODE: CNCH42

L	T	P	C
2	0	0	2

Course Objectives

Study on the chemicals used in cosmetics.

Know about soaps and detergents.

Gain Knowledge on Nutrients.

Understand the materials for agricultural chemistry.

Know about the drugs.

UNIT I CHEMISTRY IN COSMETICS (5 Hrs)

Cosmetics – Definition, classification - Additives and its role in cosmetics–Perfumes Cleansing cream, all-purpose cream, shampoos, deodorants - Antiperspirants - face powder - Compact powder, sunscreen lotion, skin colorant – lipstick. Cosmetic soaps - moisturizing soap and medicated soap. Dentifrices - toothpaste and mouth washers.

UNIT II CHEMISTRY IN THE LAUNDRY (6 Hrs)

Soaps - Basic chemical compositions of soaps, Surface active agents, builders, additives, fillers and fragrance, toilet soap, bathing bars, washing soaps. Bio-degradability. Detergents– Introduction, Detergent action, Significance of acidity and alkalinity. Common detergent chemicals.

UNIT III CHEMISTRY IN THE KITCHEN(7 Hrs)

Butter and cooking oil - saturated and unsaturated fatty acids, hydrogenation of oil. antioxidants and cholesterols. Chemistry of cooking - physical and chemical changes, stability of nutrients during cooking. Microwave cooking.

UNIT IV CHEMISTRY IN THE GARDERN(7 Hrs)

Food for plants, nutrient deficiencies in plants. Fertilizers, composting, pesticides and their toxicities. Insecticides, fungicides. Biological control of weeds and pests.

UNIT V CHEMISTRY IN TEXTILES (5 Hrs)

Fibres, yarns, and fabrics. Dyes and dyeing. Flammability. Carpet materials. Leather materials - chemistry of tanning.

Text Books

1.Chemistry of Cosmetics, R.Kumar, Prestige Publishers, 2018.

2.Textbook of Fibres and Science and Technology,S.P.Mishra, NewAge International Pvt Ltd., 2000.

3. B.K. Sharma, Industrial Chemistry, Goel Publishing House, Meerut, 2003.

Reference Book

1.TextBook of Herbal Cosmetics, M. Vimaladevi, CBS Publishers, 2019.

2. Introduction to textile Science – 3 rd. edition, Maryory Joshep

3. James A. Kent, Riegel's Hand book of Industrial Chemistry, Springer Science, 2013.