



Re-Accredited 'B++' 2.86 CGPA by NAAC

VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉદ્ધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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--: પરિપત્ર :-

યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૩-૨૪ થી અમલમાં આવેલ F.Y. B.Sc. Chemistry Sem.-1 & 2 ના અભ્યાસક્રમમાં B.Sc. Chemistry Sem.-1 માં પેપર CH-MJ-102 અને Sem.-2 માં પેપર CH- MJ-202 ના અભ્યાસક્રમમાં કરેલ સુધારા સંદર્ભે રસાયણશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૨૮/૦૩/૨૦૨૫ ની સભાના ઠરાવ ક્રમાંક:૦૩ થી કરેલ ભલામણ સ્વીકારી વિજ્ઞાન વિદ્યાશાખાની તા.૩૦/૦૪/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંક:૧૮ થી કરેલ ભલામણ સ્વીકારી એકેડેમિક કાઉન્સિલની તા.૦૫/૦૫/૨૦૨૫ ની સભાનાં ઠરાવ ક્રમાંક: ૮૫ થી નીચે મુજબ મંજૂર કરેલ છે. જેનો અમલ શૈક્ષણિક વર્ષ ૨૦૨૫-૨૬ થી કરવા આથી જાણ કરવામાં આવે છે.

બિડાણ: ઉપર મુજબ

ક્રમાંક:ઓથો./પરિપત્ર/સિલેબસ/૧૧૯૯૬/૨૦૨૫

તા.૩૧-૦૫-૨૦૨૫

કુલસચિવ

પ્રતિ,

૧) યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓ.

.....આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારું.

૨) ડીનશ્રી, વિજ્ઞાન વિદ્યાશાખા.

૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

.....તરફ જાણ તેમજ અમલ સારું.

VEER NARMAD SOUTH GUJARAT UNIVERSITY,
SURAT

Syllabus effective from
June, 2023 (for June 2025)
For
B. Sc. Semester- I
Total credit: 03 (Theory-3)

Total Hrs: Theory-45

CH-MJ-102 (Theory)

Course Code		Title of the Course	Chemistry-II
Total Credits of the Course	3	Hours per Week	3 hrs.

Course Outcome: Having Completed this course, the learner will be able to understand

1.	Basic of alkanes, cycloalkanes, chemical and physical properties, reactivity and reaction mechanisms, IUPAC Nomenclature of organic compounds
2.	Stereochemistry of organic molecules – conformation and configuration, asymmetric molecules and nomenclature, Understanding hybridization and geometry of atoms, 3-D structure of organic molecules, identifying chiral centers, synthesis and application of some important chemicals
3.	Aromatic compounds and aromaticity, synthesis and properties of Heterocyclic, Polynuclear Hydrocarbons and arenes compounds and organic qualitative analysis

Unit - 1 A. Alkanes

11h

IUPAC nomenclature of branched and unbranched alkanes, Alkyl group, Classification of carbon atoms in alkanes. Isomerism in Alkanes, sources, methods of formation special reference to Wurtz reaction, Kolbe reaction and Corey-House reaction and decarboxylation of carboxylic acids). Physical properties and chemical reactions of alkanes. Mechanism of free radical halogenations of alkanes: orientation, reactivity & selectivity.

Cycloalkanes

Nomenclature, methods of formation, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings (Cyclo propane and cyclo butane), Theory of strain less ring. The case of cyclo propane ring: banana bonds.

B. IUPAC Nomenclature of organic compounds

4 h

IUPAC nomenclature of open chain compounds having functional groups: -OH, -O-, -CHO, >C=O, -COOR, -COOH, -CONH₂, -N₂-X, NH₂, -R.

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Unit - 2	Stereochemistry	15 h
	a) Isomerism: Optical activity, Chiral and Achiral molecules, b) Optical isomerism of tartaric acid, Enantiomers, diastereomers (Threo & Erythro), Meso compounds Resolution of Racemates, inversion retention and racemization. c) Geometrical Isomerism: Alkene derivative & oximes E & Z system of nomenclature. d) Relative and absolute configuration, sequence rules. D & Land R & S system of nomenclature.	

Unit - 3	A. Heterocyclic compounds Nomenclature aromaticity, and synthesis properties uses and canonical structures of Pyrrole, Furan, Thiophene, Pyridine.	8h
	B. Polynuclear Hydrocarbons classification aromaticity and Industrial preparation, properties, uses and canonical structures of Naphthalene, Anthracene and Phenanthrene.	5 h
	C. Organic Qualitative Analysis (I) Elemental Analysis (Lassaigne Test with equation) (II) Solubility of Organic Compound (Ref.: Vogel's qualitative organic analysis) Chemical Methods: Solubility in NaHCO ₃ , NaOH and HCl, Acid, Base and Phenol and amphoteric compounds (Sulphanilic acid and Anthranilic acid)	2h

Reference Book:

1. *Organic chemistry Vol. 1 and Vol. 11 by I. L. Finar (Longman group)*
2. *Organic chemistry by P. L. Toni*
3. *Organic chemistry by R. T. Morrison and Boyd Prentice Hall india.*
4. *Organic chemistry by B. K. Sharma.*
5. *Organic chemistry by Bahl and Bahl*
6. *Organic reaction mechanism by Mukharji and Singh*
7. *Fundamentals of Organic chemistry by Solomon, John Wiely*
8. *Vogel's qualitative organic analysis*



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VEER NARMAD SOTH GUJARAT UNIVERSITY, SURAT

Syllabus effective from June, 2023 (for June 2025)

For

B. Sc. Semester- II

Total credit: 03 (Theory-3)

Total Hrs: Theory: 45

CH-MJ-202 (Theory)

Course Code		Title of the Course	Chemistry-II
Total Credits of the Course	3	Hours per Week	3 hrs.

Course Outcome: Having Completed this course, the learner will be able to understand

1.	Organic reactions such as Homolytic and Heterolytic fission, reactive intermediates, classify organic reactions, electrophilic and nucleophilic substitution reactions, Mechanism of addition reaction, substitution
2.	Carbohydrate, its classification, structure of glucose and fructose, step up, step down and Kiliani synthesis; oils and fats, determine empirical formula and its relation with molecular formula determination of molecular weight of organic acid
3.	Nomenclature, method of preparation, properties and uses of alkenes, dienes, alkynes, Synthesis and uses of some industrially important chemicals

Unit - 1 Reaction mechanism

15h

- Homolytic and Heterolytic fission free radicals carbonium ions (carbocations) and carbanions reactive intermediates carbenes, arynes and nitrenes.
- Types of reagents, electrophiles nucleophiles.
- Electromeric effect, inductive effect, conjugative effect.
- Types of reactions: Addition, substitution, elimination, rearrangements. Addition, and Substitution with respect to electrophilic and nucleophilic reaction, SN^1 & SN^2
- Mechanism of (i) addition reaction to alkenes and dienes (ii) substitution in benzene Ring, nitration, sulfonation, alkylation, acylation, halogenation, cyanohydrin formation and acetal formation,
- Mechanism of Perkin reaction, Benzoin Condensation and Cannizzaro's reaction

Unit - 2 A. Carbohydrates

10 h

Modern definition of carbohydrates, classification of carbohydrates, optical isomers, Diastereoisomers and enantiomers of Glucose and Fructose, Structure of D-Glucose and D-Fructose, Osazone formation in glucose and fructose, D and L nomenclature in Carbohydrates, step up and stepdown reaction (Kiliani method and Ruff method), conversion of glucose to Fructose and conversion of Fructose to glucose.

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h

B. Oils and Fats

5 h

Natural fats, Edible and Industrial oils of vegetable origin, common fatty acids, Glycerides, Saponification, Saponification value and Iodine value of an oil

Unit - 3

A. Alkanes, dienes, and alkynes

15 h

- a) **Alkenes:** Nomenclature, method of preparation, properties and uses of ethylene and propylene, Markovnikov's rule and Saytzeff's rule, polymerization of Ethylene styrene and vinyl chloride. Alkenes. Reactions: Hydroboration, Oxidation, Epoxidation, Ozonolysis, Oxymercuration, Hydroxylation, Hydrohalogenation, Dehydrohalogenations, Hydration.
- b) **Dienes:** Nomenclature, classification of dienes methods of formation of Butadiene chemical reactions 1,2 and 1,4 additions, Diels – Alder reaction.
- c) **Alkynes:** Nomenclature, methods of formation, chemical reactions: Hydroboration, Oxidation, metal ammonia reduction, oxidation, polymerization. Electrophilic and nucleophilic addition reactions of acetylene.

Reference Books:

1. *Organic chemistry Vol. 1 and Vol. 11* by I. L. Finor (Jongman firoup)
2. *Organic chemistry* by P. L. Soni
3. *Organic chemistry* by R.T. Morrison and Boyd Prentice Hall India.
4. *Organic chemistry* by B.K. Sharma.
5. *Organic chemistry* by Bahl and Bahl
6. *Organic reaction mechanism* by Mukharji and singh
7. *Fundamentals of Organic chemistry* by Solomon, John Wiely
8. *Vogel's qualitative organic analysis*
9. *Industrial chemistry* by B. K. ShariTia

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