

Government Degree College , R.S.Pura

COURSE OUTCOMES : CHEMISTRY

Semester-I, (CORE COURSE)

Title of Paper:Atomic Structure,Bonding ,General Organic Chemistry & Aliphatic hydrocarbons..

Course Code:UCHTC-101

Number of Units: 4

Course Content

- **Section A : Inorganic chemistry-I**
- Unit-I: ATOMIC STRUCTURE
- Unit-II: Chemical Bonding and Molecular structure
- **Section B : Organic Chemistry-I**
- Unit-III: .Fundamentals of Organic Chemistry
- Unit-IV: .Stereochemistry

- **Course Outcome:**This Course will help to understand the aspects of atomic structure,bonding involved,molecular structure,etc.The fundamentals of organic chemistry coupled with basic stereochemistry are introduced in this structure.

Semester-I, (core COURSE)

Title of Paper: Laboratory Course:Chemistry-I

Course Code: :UCHPC-102

Number of Sections: 2

Course Content

<ul style="list-style-type: none"> ● Section A : Inorganic Chemistry-Volumetric Analysis ● Section B : Organic Chemistry 	<ul style="list-style-type: none"> ● Course Outcome:The students will be trained in volumetric analysis,detection of elements and separation of mixtures by chromatography.Use of paper chromatography as a separation technique will be an additional advantage.
<p>Semester-II, (CORE COURSE)</p> <p>Title of Paper:: CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY</p> <p>Course Code: UCHTC201</p> <p>Number of Units: 7</p> <p>Course Content</p>	
<ul style="list-style-type: none"> ● Section A: Physical Chemistry-1 ● Unit 1: Chemical Energetics ● Unit 2: Chemical Equilibrium ● Unit 3: Ionic Equilibria ● Section B: Organic Chemistry-II ● Unit 4: Aromatic hydrocarbons ● Unit 5: Alkyl and Aryl Halides ● Unit 6: Alcohols, Phenols and Ethers (Upto 5 Carbons) ● Unit 7: Aldehydes and ketones (aliphatic and aromatic) 	<ul style="list-style-type: none"> ● Course Outcome: This course covers principles of thermo chemistry, thermodynamics and chemical/ionic equilibrium. The basic fundamentals of organic chemistry and aliphatic as well as aromatic hydrocarbons will help the students in laying the foundation for the advance studies of organic chemistry.
<p>Semester II, (Core COURSE)</p> <p>Title of Paper: Laboratory Course: Chemistry-II</p>	

<p>Course Code:UCHPC202</p> <p>Number of Sections: 2</p> <p>Course Content</p>	
<ul style="list-style-type: none"> ● Section A: Physical Chemistry(Thermochemistry & Ionic equilibria) ● Section B: Organic Chemistry 	<ul style="list-style-type: none"> ● Course Outcome: The practical component involves some theoretical aspects studied in this semester in the form of practical shape. The experiments on thermochemistry, purification and preparation of organic compounds will create confidence amongst the students.
<p>Semester III, (CORE COURSE)</p> <p>Title of Paper : SOLUTIONS, PHASE EQUILIBRIUM, CONDUCTANCE, ELECTROCHEMISTRY & FUNCTIONAL GROUP ORGANIC CHEMISTRY</p> <p>Course Code: UCHTC301</p> <p>Number of Units: 8</p> <p>Course Content</p>	
<ul style="list-style-type: none"> ● Section A: Physical Chemistry-II ● Unit-1: Solutions ● Unit-2: Phase Equilibrium ● Unit-3: Conductance ● Unit-4: Electrochemistry ● Section B: Organic Chemistry-III 	<ul style="list-style-type: none"> ● Course Outcome: The ideas of solutions, phase equilibrium, conductance, electrochemistry from Physical Chemistry and aliphatic/ aromatic acids, amino acids, peptides, proteins, carbohydrates from Organic Chemistry will be dealt in details.

- Unit-5: Carboxylic acids and their derivatives
- Unit-6: Amines and Diazonium Salts
- Unit-7: Amino Acids, Peptides and Proteins
- Unit-8: Carbohydrates

Semester III, (Core COURSE)

Title of Paper: Laboratory Course: Chemistry-III

Course Code: UCHPC302

Number of Sections: 2

Course Content

- **Section A: Physical Chemistry(Distribution,Phase equilibria,Conductance&Potentiometry)**
- **Section B: Organic Chemistry**

- **Course Outcome:** The experiments on distribution, law, conductance, potentiometer, qualitative analysis of organic compounds will be conducted.

SemesterIII, (SKILL ENHANCEMENT COURSE)

Title of Paper: : COSMETICS, PERFUMES AND MEDICINAL AGENTS FROM NATURAL SOURCES (Skill Enhancement Course)

Course Code: : UCHTS303

Course Content

- A general study including preparation and uses of the following: Hair dye, hair spray, shampoo, suntan lotions, face powder, lipsticks, talcum powder, nail enamel, creams , antiperspirants and artificial flavours.

- **Course Outcome:** The skill enhancement course in 3rd semester will help the students to know the products used in daily life.

<ul style="list-style-type: none"> ● Essential oils and their importance in cosmetic industries. Different systems of classification of drugs of natural origin their merits & demerits. Study of mineral ingredients. Kaolin, Bentonite, Talc., Fuller's earth. ● Study of the following with reference to their sources, characters, chemical constituents, identification tests and cosmetic uses. i) Carbohydrate – Starches, Agar, Gum Acacia. ii) Lipids – A study of following; Caster oil, Linseed oil, Sesame oil, Coconut oil. iii) Wheat germ. Oil, Jojoba oil, rice bran oil, Spermaceti. Cosmeceuticals – study of hair care herbs and skin care herbs as active ingredients. ● Tannins – Classification, identification and study of the following – Black Catechu, Tannic Acid, Amla, Behra, Hirda, Arjun, Ashok. 	
<p>Semester IV, (CORE COURSE)</p> <p>Title of Paper: COORDINATION CHEMISTRY, STATES OF MATTER & CHEMICAL KINETICS</p> <p>Course Code: UCHTC401</p> <p>Number of Units: 7</p> <p>Course Content</p>	
<ul style="list-style-type: none"> ● Section A: Inorganic Chemistry-II ● Unit 1: Transition Elements (3d series) ● Unit 2: Coordination Chemistry ● Unit 3: Crystal Field Theory ● Section B: Physical Chemistry-III ● Kinetic Theory of Gases 	<ul style="list-style-type: none"> ● Course Outcome: This course consists of some parts from Inorganic Chemistry and some parts of Physical Chemistry. Good familiarity with transition elements, coordination chemistry and crystal field theory will help the students to develop interest in the advanced areas of this study. The Physical

<ul style="list-style-type: none"> ● Unit 4: Kinetic Theory of Gases ● Unit 5: Liquids ● Unit 6: Solids ● Unit 7: Chemical Kinetics 	<p>Chemistry section deals with states of matter, namely, solids, liquids and gases. Additionally, basic kinetic studies are introduced in this section.</p>
<p>Semester IV , (CORE COURSE)</p> <p>Title of Paper: Laboratory Course: Chemistry-IV</p> <p>Course Code: UCHPC402</p> <p>Number of Sections : 2</p> <p>Course Content</p>	
<ul style="list-style-type: none"> ● Section A: Inorganic Chemistry ● Section B: Physical Chemistry 	<ul style="list-style-type: none"> ● Course Outcome: The students will be involved in analysing salts qualitatively along with quantitative estimation. They will also be trained in the experiments in solution chemistry as well as in determining the order of reaction.
<p>Semester IV , (SKILL ENHANCEMENT COURSE)</p> <p>Title of Paper:: PESTICIDE CHEMISTRY (Skill Enhancement Course)</p> <p>Course Code:: UCHTS403</p> <p>Course Content</p>	

<ul style="list-style-type: none"> ● General introduction to pesticides (natural and synthetic), benefits and adverse effects, Peptide management, Peptide classification on use, chemical nature, formulation, toxicity and action. Changing concepts of pesticides, structure activity relationship. Synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Lindane, Aldrin, Dieldrin, Gammexene); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor). 	<ul style="list-style-type: none"> ● Course Outcome: It is a skill enhancement course which deals in pesticide chemistry useful for agricultural purposes.
<p>Semester V, (DISCIPLINE SPECIFIC ELECTIVE COURSE)</p> <p>Title of Paper: SPECTROSCOPY, PHOTOCHEMISTRY AND ORGANO METALLICS AND BIOINORGANIC CHEMISTRY</p> <p>Course Code: UCHTE501</p> <p>Number of Units: 6</p> <p>Course Content</p>	
<ul style="list-style-type: none"> ● Section A: Physical Chemistry-IV ● Unit 1: Molecular Spectroscopy ● Unit 2: Photochemistry ● Unit 3: Physical properties and Molecular Structure ● Section B: Inorganic Chemistry-III ● Unit 4: Chemistry of 3d metals ● Unit 5: Organometallic Compounds ● Unit 6: Bio-Inorganic Chemistry 	<ul style="list-style-type: none"> ● Course Outcome: The course deals in Chemistry of 3d elements, organometallic compounds and bioinorganic chemistry. The fundamentals of molecular spectroscopy will help in understanding the molecular spectroscopy.

Semester V, (DISCIPLINE SPECIFIC ELECTIVE COURSE)

Title of Paper: Laboratory Course: Chemistry-V

Course Code: UCHPC502

Number of Sections: 2

Course Content

- UV/Visible spectroscopy
- Colourimetry

- **Course Outcome:** The lab course involves some experiments based on instrumentation

Semester V, (SKILL ENHANCEMENT COURSE)

Title of paper: FUEL CHEMISTRY (Skill Enhancement Course)

Course code: : UCHTS503

- Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value(Coal,Petroleum and Petrochemical Industry&Lubricants)

- **Course Outcome:** It is also skill enhancement course which deals in coal, petroleum products, Fuel Chemistry, lubricants, etc.

Semester VI, (DISCIPLINE SPECIFIC ELECTIVE COURSE)
Title of Paper: INORGANIC MATERIALS OF INDUSTRIAL
IMPORTANCE AND ORGANIC SPECTROSCOPY
Course code: : UCHTS601

- **Section A: Inorganic Chemistry-IV**
- Unit 1: Recapitulation of s- and p-Block Elements
- Unit 2: Fertilizers
- Unit 3: Batteries
- Unit 4: Catalysis
- Unit 5: Chemical explosives
- **Section B: Organic Chemistry-IV**
- Unit 6: Active methylene compounds
- Unit 7: Application of Spectroscopy to Simple Organic Molecules
 - a) Electromagnetic spectrum
 - b) Spectroscopy

- **Course Outcome:** The study of inorganic materials of industrial importance and study of UV/Visible and NMR Spectroscopy of simple organic compounds forms the foundations of this course

Semester VI, (DISCIPLINE SPECIFIC ELECTIVE COURSE)
Title of Paper: - Laboratory Course: Chemistry-VI
Course No.: UCHPC602

1. Determination of free acidity in ammonium sulphate fertilizer.
2. Estimation of calcium in calcium ammonium nitrate fertilizer.
3. Estimation of phosphoric acid in superphosphate fertilizer.
4. Electroless metallic coatings on ceramic

- **Course Outcome:** The experiments on analysis of industrial products, including cement, fertilizers, pigments and preparation and spectroscopic study of simple organic compounds will be covered in the course.

and plastic material.

5. Determination of composition of dolomite (by complexometric titration).

6. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples.

7. Analysis of Cement. 8. Preparation of pigment (zinc oxide).

9. Preparations: (i) Beckmann rearrangement of Benzophenone oxime (ii) Benzilic acid from benzyl (iii) 4-nitroacetanide from acetanilide (iv) Acetanilide from aniline with Zn/AcOH

Semester VI, (Skill Enhancement Course)
Title of Paper: GREEN METHODS IN CHEMISTRY.
Course No.: UCHTS603

Introduction: Definitions of Green Chemistry. Brief introduction of twelve principles of Green Chemistry, with examples, special emphasis on atom economy, reducing toxicity, green solvents, Green Chemistry and catalysis and alternative sources of energy, Green energy and sustainability

Course Outcome: Skill development course in which usefulness of green methods in chemistry will be discussed.