

**SKR Govt. Degree College,
GUDUR**

**Department of Chemistry
Objectives & learning outcomes**

Course Code	Course Name	Objectives	Learning Outcomes
3-1-106	Title of the course – Inorganic & Organic Chemistry INORGANIC CHEMISTRY Unit I : P- Block elements-I (Group- 13, 14, 15) Unit II: 1. P- Block elements-II (Group- 16, 17) 2. Organometallic Chemistry ORGANIC CHEMISTRY Unit III: Structural theory in organic chemistry Unit IV: 1. Acyclic hydrocarbons 2. Alicyclic hydrocarbons Unit V: Benzene and its reactivity	Main objectives of the course ➤ To develop fundamental concepts related to ‘p- block elements (Groups- 13, 14, 15, 16, 17)’ in general. In particular, to understand the definitions involved, sources of these elements, methods of preparation of some important compounds made up of these elements, physical and chemical properties. Most importantly, students must be able to appreciate the important and latest applications of these elements and their compounds. The students must be able to apply the skills developed after learning this unit to solve day today issues related to chemistry. ➤ To develop fundamental concepts related to ‘Organometallic Chemistry’ in general. In particular, to understand the definitions involved, methods of preparation of some important organometallic compounds, physical and chemical properties. Most importantly, students must be able to appreciate the	Learning outcomes of the course ➤ After learning ‘P- block elements’, students are expected to recall the various definitions, concepts related to them and apply these concepts as and when required. Realize, the industrial significance of these elements and their compounds. Also, their applications in our daily. ➤ After the completion of ‘Organometallic chemistry’, students should be able to realize the potential applications of these compounds in the synthesis of various chemicals and polymers of day today use both at laboratory level in micro scale and industrially in macro scale. ➤ After learning ‘Structural theory in organic chemistry’, students are expected to be well versed with all the fundamental concepts of organic chemistry such as bond fission, inductive effect, mesomeric effect, hyper conjugation etc. Also, explanation for acidity and basicity based on these concepts. ➤ After going through ‘Acyclic hydrocarbons’ and ‘Alicyclic hydrocarbons’, students are

		important and latest industrial, laboratory level applications of these compounds. ➤ 'Structural theory in organic chemistry' is a very important and primary course in organic chemistry. Hence, emphasis should be to develop all fundamental concepts related to this chapter carefully in students. After the learning of this chapter students must be able to apply these concepts in explaining various phenomena that they encounter in organic chemistry logically. ➤ To make the students aware of various methods of preparation of cyclic, acyclic hydrocarbons and benzene. Students are supposed to have idea on physical and chemical properties, concept of resonance, Huckel theory related to aromatic compounds, Bayer's strain theory related to cyclic hydrocarbons. Proper and systematic learning of these concepts would help students to have faster and better understanding of future courses. ➤ To develop the skills in practical aspects such as safe handling of the apparatus and chemicals, systematic and tidy recording of the observations, drawing diagrams and graphs.	expected to know the differences between them, methods of synthesis, chemical properties, various types of strains involved in the cyclic hydrocarbons and their effect on their geometry and chemical properties, theories of strain such as Bayer's theory. ➤ After going through 'Benzene and its reactivity', students are to be in a position to apply the concept of resonance in explaining different phenomena such as acidity, basicity of acids, phenols and amines. Also, they are expected to be in a position to explain the preference of electrophilic and nucleophilic substitutions for ortho, para or meta positions. ➤ Students must have developed the skills related to practicals such as safe handling of chemicals and the apparatus, recording the observations, drawing diagrams and graphs. ➤ Students must have developed inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve problems.
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Course Code	Course Name	Objectives	Learning Outcomes
		➤ To develop inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve problems. ➤ To develop personality traits such as Punctuality, faithfulness, honest recording of the scientific data and self-confidence.	➤ The students must have developed personality traits such as Punctuality, faithfulness, honest recording of scientific data and self-confidence.

3-2-106	Title of the course – Physical & General Chemistry PHYSICAL CHEMISTRY Unit I : Solid state Unit II: 1. Gaseous state 2. Liquid state Unit III: Solutions GENERAL CHEMISTRY Unit IV: 1. Surface chemistry 2. Chemical Bonding Unit V: Stereochemistry of carbon compounds	Main objectives of the course ➤ To develop fundamental concepts related to Solid state, Gaseous state, Liquid state and Solutions in physical chemistry. They should get clear idea of the differences among the three states of matter. Students must be made familiar with laws of symmetry, Brag's law, X- ray diffraction and crystal defects in solid state. Students are to be exposed to basic laws of gases such as Boyle's law, Charles law etc. They must know what are ideal gases and real gases and the equations related to it. As far as Liquid state is concerned, they must be made familiar with the classification of liquids, basis on which the classification is done and applications of liquid crystals. In solutions, students must be made aware of differences between ideal gases and real gases and the laws governing them. 'Azotropic mixtures' and their applications. Partially miscible solutions, their classification and the concept of 'critical solution temperature'. ➤ To develop fundamental concepts related to general chemistry in topics- Surface chemistry, Chemical bonding and Stereochemistry of organic compounds. In surface chemistry students must be exposed to definitions of colloids, gels, emulsions, gold number, protective colloids etc. They are to be aware of classification of colloids, properties, preparation methods and applications. In chemical bonding students are to be exposed to theories of chemical	Learning outcomes of the course ➤ After going through the topic 'Solid state', students will be in a position to apply the concepts of the topic in various scientific situations, say, conductivity of crystals due to crystal defects etc. Learning 'Gaseous state' by students empower them with the ability to differentiate between real and ideal gases. Also, they will be in a position to explain why only real gases show Joule-Thomson effect and why only real gases can be liquified. Learning 'Liquid state' makes them aware of classification of liquid crystals and will be in a position to explain the functioning of LCD. Learning 'Solutions' will not only make the students aware of all the fundamental concepts of it, but also bring the familiarity of its applications such as isotonic solutions, azeotropic mixtures etc. ➤ After learning 'Surface chemistry' students will have clear idea of all the concepts and will be in a position to apply the concepts in explaining water purification methods, colloidal medicines etc. Of all, 'Chemical bonding' is the most important and fundamental topic of chemistry. Learning this would empower the student to explain most of the chemical phenomena in daily life. Understanding 'Stereochemistry' will make the students to appreciate how the three dimensional structure of molecules effect their chemical and
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		bonding such as- valance bond theory, molecular orbital theory etc. Applications of MOT are important. In stereochemistry, students must be made aware of structural, geometric, optical isomerism concepts and their applications ➤ To develop the skills in practical aspects such as safe handling of the apparatus and chemicals, systematic and tidy recording of the observations, drawing diagrams and graphs. ➤ To develop inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve problems. ➤ To develop personality traits such as Punctuality, faithfulness, honest recording of the scientific data and self-confidence.	physical properties. Also, they are in a position to explain the importance of stereochemistry in medicine. ➤ Students must have developed the skills related to practicals such as safe handling of chemicals and the apparatus, recording the observations, drawing diagrams and graphs. ➤ Students must have developed inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve problems. ➤ The students must have developed personality traits such as Punctuality, faithfulness, honest recording of scientific data and self-confidence
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Course Code	Course Name	Objectives	Learning Outcomes
3-3-106	<i>Chemistry Paper III : (INORGANIC & ORGANIC CHEMISTRY)</i>	<i>The Main Objectives of the course are</i>	<i>After successful completion of the course the learning outcomes are</i>
	1. Chemistry of d-block elements	➤ To acquire knowledge on Transition metals and their electronic configuration, oxidation states, spin properties, Colour property, magnetic properties and Catalytic applications of d-block elements.	➤ The students could able to know the electronic configuration of d-block elements and its effect on colour and magnetic properties. Catalytic properties of d-block elements its industrial applications.
	2. Theories of bonding in metals	➤ To understand the Bonding in metals, Conductivity of metals, Semiconductors and its applications.	➤ The students could able to know the conductors and semiconductors.
	3. Metal carbonyls	➤ To acquire the knowledge on structures of metal carbonyls, EAN and stability of metal carbonyls.	➤ Calculation of EAN and its relation with stability of metal carbonyls.
	4. Chemistry of f-block elements	➤ To acquire knowledge on properties of Lanthanides and Actinides, Oxidation states related to stability, colour and magnetic properties, Lanthanide contraction and its consequences.	➤ Recognises the difference between d-block elements and f-block elements, Lanthanide contraction and its consequences, Colour properties, Lanthanides separation.
	5. Halogen compounds	➤ To understand the Nucleophilic Substitution reactions in organic halogen compounds, SN^1 and SN^2 reactions, Comparison of reactivity.	➤ Acquires knowledge on halogen derivatives of organic compounds, Types of organic reactions, Importance of stereochemistry in the organic reactions especially in substitution reactions.
	6. Hydroxy compounds	➤ To acquire knowledge on preparation and reactivity of alcohols and phenols, acidity of alcohols and phenols.	➤ Able to differentiate alcohols and phenols, able to write preparative methods for alcohols and phenols.
		➤ To understand the preparation and	➤ Distinguishes between different

	7. Carbonyl compounds	reactivity of carbonyl compounds, Nucleophilic addition reactions, Base catalysed reactions.	carbonyl compounds, able to write preparation methods of carbonyl compounds, Synthetic importance of base catalysed reactions.
	8. Carboxylic acids and derivatives	➤ To acquire knowledge on Preparation and reactivity of carboxylic acids, concept of hydrogen bonding and related to acidity of carboxylic acids, Named reactions related to carboxylic acids.	➤ Names the carboxylic acids according to IUPAC, describes the acidity, write the methods of preparation and reactivity.
	9. Active methylene compounds	➤ Preparation and synthetic applications Malonic ester and Acetoacetic ester.	➤ Able to describes the importance of carbanion in the organic synthesis, write the synthetic applications of malonic ester and acetoacetic ester.

Course Code	Course Name	Objectives	Learning Outcomes
3-4-106	SPECTROSCOPY & PHYSICAL CHEMISTRY	<i>The Main Objectives of the course are</i>	<i>After successful completion of the course the learning outcomes are</i>
	SPECTROSCOPY UNIT-I : Spectrophotometry and electronic spectroscopy Unit-II: Infra red spectroscopy Unit-III: Proton magnetic resonance spectroscopy (^1H-NMR) PHYSICAL CHEMISTRY Unit-I: Dilute solutions Unit-II: Electrochemistry-I	➤ To understand absorption of light, Beer-Lambert law and its applications. ➤ To know the basic principle of UV Spectroscopy and electronic transitions, conjugated aromatic systems. ➤ To understand the basic principle of IR spectroscopy and its applications. ➤ To understand the equivalent and non-equivalent protons in the organic molecules, basic principle of NMR, chemical shifts and its applications in the structural elucidation of organic molecules. ➤ To understand the properties of dilute solutions and Colligative properties and experimental determination of Colligative properties. ➤ To know the electrolytes, effect of conductance on dilution, Kohlrausch's law, Debye-Huckel-Onsagar's equation, transport numbers.	➤ Students will able to apply Beer-Lambert law for quantitative determinations. ➤ Able to identify the type of conjugation in organic molecules and effect of conjugation on colour of the compounds. ➤ Able to know the modes of vibrations in organic molecules. ➤ Able to identify type of functional group present in the organic molecules. ➤ Able to learn the magnetic behaviour of ^1H and elucidation of structures of organic compounds by using ^1H-NMR data. ➤ Students could able to determine the molecular weight by using experimental determination of Colligative properties. ➤ Student could able differentiate strong electrolytes and weak electrolytes. ➤ Able to understand effect of dilution on conductance for strong electrolytes and weak electrolytes. ➤ Able to determine the transport numbers.

	Unit-III: Electrochemistry-II Unit-IV: Phase rule	➤ To understand Reversible and irreversible cells, electrode potentials, Reference electrode, SHE, EMF determination and its applications. ➤ To understand the concept of Phase diagram, phase diagram of one component and two component systems, Pb-Ag system, NaCl-Water system.	➤ Student could able to calculate the EMF of the given cell. ➤ Differentiate the reversible and irreversible cells. ➤ Students could able to learn the applications of phase rule in metallurgy, desilverisation of lead.
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Course Code	Course Name	Objectives	Learning Outcomes
3-5-107	Chemistry Paper V : (INORGANIC, ORGANIC & PHYSICAL CHEMISTRY)	The Main Objectives of the course are	After successful completion of the course the learning outcomes are
	10. Coordination Chemistry 11. Spectral and magnetic properties of metal complexes 12. Stability of metal complexes 13. Nitro hydrocarbons 14. Nitrogen compounds 15. Thermodynamics	➤ To understand the basic concepts of coordinate chemistry, bonding theories of complex compounds, Colour and Magnetic properties, Isomerism in coordination compounds. ➤ To study about colour and spectral properties of complex compounds and to learn about magnetic behaviour of different complexes. ➤ To differentiate the thermodynamic stability kinetic stability how they are related to stability and reactivity of the complexes. Factors affecting the stability, determination of composition of complexes. ➤ To understand the nomenclature, preparation methods and reactivity of nitro hydrocarbons ➤ To know the nomenclature of aliphatic and aromatic amines, Preparation and reactivity of amines, Basicity of amines, separation of amines ➤ To understand the basic terminology of thermodynamics, First law of thermodynamics its applications, Internal energy, enthalpy, heat capacities, Entropy.	➤ Students able to learn the bonding in the coordinate compounds, stability, colour and magnetic properties, Learn the CFSE calculations, Isomerism in complex compounds. ➤ Able to know the colour phenomenon and calculation of magnetic moment. ➤ Able to know the stability and reactivity of the complexes, labile and inert complexes, Methods for determination of composition of the complexes. ➤ Able to understand the nomenclature of nitro hydrocarbons, tautomerism in nitro hydrocarbons ➤ Students understand the nomenclature of amines, Basicity of amines, comparison of basicity, separation of amines. Chemical properties of amines. ➤ Able to learn the different types of thermodynamic systems, reaction energies, feasibility of the chemical reactions, entropy and its significance.

Course Code	Course Name	Objectives	Learning Outcomes
3-6-105 Open elective	Elective Paper – VII-(A)- Analytical Methods In Chemistry	<i>The Main Objectives of the course are</i>	<i>After successful completion of the course the learning outcomes are</i>
	UNIT-I-Quantitative analysis Unit-II- Treatment of analytical data Unit-III- Separation Techniques In Chemical Analysis- A) Solvent Extraction B) Ion Exchange Unit-IV- Chromatography Principle Unit-V- TLC, Column chromatography, HPLC	➤ To understand the principle and applications of volumetric and gravimetric analysis. ➤ To identify different errors in quantitative determinations, to understand method of expressing the accuracy and precision, methods for minimization of errors. ➤ To understand principle and applications of different solvent extraction techniques. ➤ To know the ion exchange process and its importance water purification and other industrial importance. ➤ To understand the principle of chromatographic process, stationary phase, mobile phase, R_f values, types of chromatographic techniques. ➤ To understand the classification, principle and applications of paper chromatography, TLC, column chromatography, and HPLC.	➤ Student could able to learn and acquired skill on different titrations for quantitative determinations. ➤ Acquire skill on choice of indicators in titrations. ➤ Learn Chemical calculations in gravimetric and volumetric analysis. ➤ Could able to process the analytical data. ➤ Could learn how to minimise errors in chemical experiments. ➤ Could aware on the Batch extraction, continuous extraction and counter current extraction and their applications. ➤ Student could able to learn the cation exchanger and anion exchanger and uses industrial applications. ➤ Student could able to know the basics of chromatographic techniques and their applications. ➤ Student could able acquire some basic knowledge of Chromatographic techniques and its applications.

Course Code	Course Name	Objectives	Learning Outcomes
3-6-105-A (Cluster-1)	Title of the course –Polymer chemistry Unit I : Introduction to polymers Unit II: Techniques of polymers- molecular weight of polymers Unit III: Polymer characteristics Unit IV: Polymer additives Unit V: Polymers and their applications	Main objectives of the course - In the present course the students shall try to understand certain important points of chemistry. To acquire the knowledge of terms, facts, concepts, definitions, laws, principles, processes, preparation & properties of polymer compounds. The students learn a few salient features degree of polarization, classification of polymers, Natural & synthetic polymers, organic & inorganic polymers, Thermoplastic & thermosetting polymers, Plastics & elastomers, fibers & resins, linear, branched & cross linked polymers, addition polymers & condensation polymers, mechanism of polymerization, free radical, ionic & Ziegler-Natta polymerization - The students try to learn & examine the following concepts: Techniques of polymerization-Bulk polymerization-solution, Polymerization, suspension & emulsion polymerization. Molecular weight of polymers-Number average and weight average molecular weights. Determination of molecular weight of polymers by viscosity and osmometry and light scattering methods. - The students to acquire knowledge in the analysis of preparation and properties of Polymer characteristics: kinetics of free radical polymerization, glass transition	Learning outcomes of the course - Students are expected to acquire the knowledge of understanding preparation and properties of polymers. Explain degree of polarization, classification of polymers, Natural & synthetic polymers, organic & inorganic polymers, Thermoplastic & thermosetting polymers, Plastics & elastomers, fibers & resins, linear, branched & cross linked polymers, addition polymers & condensation polymers, mechanism of polymerization, free radical, ionic & Ziegler-Natta polymerization - Students learn about the techniques of polymerization-Bulk polymerization-solution, Polymerization, suspension & emulsion polymerization. This course can explain molecular weight of polymers-number average and weight average molecular weights. Determination of molecular weight of polymers by viscosity and osmometry and light scattering methods. - Students able to know about The students to acquire knowledge in the analysis of preparation and properties of Polymer characteristics: kinetics of free radical polymerization, glass transition temperature and factors affecting its determination, free volume theory, WLF equation.

		temperature and factors affecting its determination, free volume theory, WLF equation. • The students try to understand and discuss the important features of Polymer additives: plastic additives-filters, plasticizers and softners, lubricants, flow promoters, anti aging additives, flame retardants, colourants, blowing agents, cross linking agents, photo stabilizers, nucleating agents. • In this unit students try to discuss the following aspects of Polymers and their applications: preparation of ad industrial applications of polyethylene, poly vinyl chloride, teflon, terelene, poly acrylonitrile, nylon 6,6 and silicones.	• Students analyze the factors after learning this unit polymer additives: plastic additives-filters, plasticizers and softners, lubricants, flow promoters, anti aging additives, flame retardants, colourants, blowing agents, cross linking agents, photo stabilizers, nucleating agents. • Students be able to predict factors and know about Polymers and their applications: preparation of ad industrial applications of polyethylene, polyvinylchloride, teflon, terelene, polyacrylonitrile, nylon 6,6 and silicones.
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3-6-105B	Title of the course – Instrumental Methods Of Analysis UNIT – I Introduction to spectroscopic methods of analysis UNIT – II Molecular spectroscopy: Infrared spectroscopy UNIT – III UV-Visible/ Near IR UNIT – IV Separation techniques- (1)Chromatography (2)Mass spectroscopy UNIT – V (1) Elemental analysis: Mass spectrometry (electrical discharges) (2) NMR spectroscopy (3) Electro analytical Methods: Potentiometry & Voltammetry (4) Radiochemical Methods: X-ray analysis and electron spectroscopy (surface analysis)	Main objectives of the course ➤ To develop bird's eye view of the spectroscopic methods covered in earlier years in the core chemistry syllabus. To develop the skills related to mathematical analysis of data, including error analysis. To develop the overall view of the classification of analytical methods and the types of instrumental methods in students. To make the students aware of full electromagnetic spectrum and appreciate the importance of it in spectroscopy. ➤ To develop fundamental concepts related to Infrared spectroscopy and UV/Visible spectroscopy. Students must be able to understand what type of structural information can be obtained/elicited from these spectroscopic techniques. Students must be made aware of significance of these techniques in pharmaceutical, petro chemical, fertilisers, dye and many more chemistry related industries. ➤ To develop fundamental concepts related to chromatography and mass spectrometry. Students must be made to appreciate their industrial importance and other applications. ➤ To develop all fundamental concepts related to Mass spectrometry, NMR spectroscopy, Potentiometry, Voltammetry, X-	Learning outcomes of the course ➤ After learning spectroscopic methods students must have developed all concepts related to it, have sound knowledge on the type of molecular structural information that can be elicited and their industrial significance. ➤ After going through Infrared and UV/Visible spectroscopic methods, students are expected to understand the fundamental concepts related to them and apply them in problem solving. They must be aware of their industrial and research applications. ➤ After going through Chromatography and Mass spectroscopy, students are expected to apply these concepts in problem solving. Students must be in a position to handle chromatographic instruments in the separation of dye mixtures etc. ➤ After learning NMR spectroscopy, Potentiometry, Voltammetry, X-ray analysis etc., students must be in a position to appreciate their industrial importance and applications. They must have clear idea of type of structural information obtained from these techniques. ➤ Students must have developed the skills related to practicals such as safe handling of chemicals and the apparatus, recording the observations, drawing diagrams and graphs.
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		ray analysis and electron spectroscopy. Students should be made aware of what type of information can be elicited from each of these methods. ➤ To develop the skills in practical aspects such as safe handling of the apparatus and chemicals, systematic and tidy recording of the observations, drawing diagrams and graphs. ➤ To develop inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve problems. ➤ To develop personality traits such as punctuality, faithfulness, honest recording of the scientific data and self-confidence.	➤ Students must have developed inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve problems. ➤ The students must have developed personality traits such as punctuality, faithfulness, honest recording of scientific data and self-confidence.
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Course Code	Course Name	Objectives	Learning Outcomes
3-6-105-C	Title of the course – Drugs & Dairy products analysis Unit I : Analysis of Aspirin, Paracetamol, Chloroquine, Amoxycilin, Chloramphenicol, metronidazole, Penicillin, Tetracycline, Cefalexin & Isoniazid Unit II: Analysis and preparations of Allegra, Zyrtec, Alprazolam, trazodone, lorazepam, Ambien & Diazepam Unit III: Analysis of Phenobarbital, Phenacemide, Atenolol, Norvasc, Lipitor, Furosemide, Triamterene & Lansoprazole Unit IV: Analysis of milk and milk products, Analysis of food materials & Flavoring agents Unit V: Clinical analysis of blood, estimation of blood cholesterol, Glucose, Enzymes, RBC & WBC.	Main objectives of the course - In this course the students shall try to understand certain important aspects of chemistry. To acquire the knowledge of terms, facts, concepts, definitions, laws, principles, processes, preparation & properties of compounds. The students learn a few salient features of analysis of Aspirin, Paracetamol, Chloroquine, Amoxycilin, Chloramphenicol, metronidazole, Penicillin, Tetracycline, Cefalexin & Isoniazid. - The students try to understand & examine the following drugs analysis, preparations & of Allegra, Zyrtec, Alprazolam, trazodone, lorazepam, Ambien & Diazepam - The students to acquire knowledge in the analysis of preparation and properties of drugs Phenobarbital, Phenacemide, Atenolol, Norvasc, Lipitor, Furosemide, Triamterene & Lansoprazole - The students try to understand and discuss the important features of analysis of milk and milk products, analysis of food materials & flavoring agents	Learning outcomes of the course - Students are expected to acquire the knowledge of understanding preparation and properties of drugs like Aspirin, Paracetamol, Chloroquine, Amoxycilin, Chloramphenicol, metronidazole, Penicillin, Tetracycline, Cefalexin & Isoniazid. - Students learn about the various drugs analysis and preparations of Allegra, Zyrtec, Alprazolam, trazodone, lorazepam, Ambien & Diazepam - Students able to know about analysis Preparation & properties of Phenobarbital, Phenacemide, Atenolol, Norvasc, Lipitor, Furosemide, Triamterene & Lansoprazole - Students analyze the factors after learning this unit analysis of milk and milk products, analysis of food materials & flavoring agents - Students able to predict factors and know about Clinical analysis of blood, estimation of blood cholesterol, Glucose, Enzymes, RBC & WBC. - Students must have developed the skills related to practicals such as safe handling of chemicals, instruments,

		• In this unit students try to understand the following aspects of Clinical analysis of blood, estimation of blood cholesterol, Glucose, Enzymes, RBC & WBC. • After the learning of this course students must be able to apply these concepts in explaining various phenomena in organic chemistry .	glassware and apparatus, recording the observations, drawing, tables diagrams and graphs. Students must have developed inquisitive spirit, scientific temper, rational thinking, logical interpretation of data obtained and systematic approach to solve their problems.
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