

## F.Y.B.Sc.

Class	Sr.no	Sub Name/Course Name	Outcomes
F.Y.B.Sc	1	Subject Name : <b>Algebra and Geometry</b> Course code : MT101	1)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting.  2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.  3) A student take be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays ,state important facts resulting from their studies.  4) A student takes relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.
	2	Subject Name: <b>Calculus and Differential equations</b> CourseCode:MT102	1 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.  2) students develop a positive attitude towards mathematics as aninteresting and valuable subject of study.  3)student prepare the mathematical models related to basic mathematics.
1	F.Y.B.Sc	PhyI PH:111Mechanics        ----- PH112 Heat and Thermodynamics	On successful completion of this course students will be able to do the following: 1. Demonstrate an understanding of Newton's laws and applying them in calculations of the motion of simple systems.2. Use the free body diagrams to analyse the forces on the object. 3. Understand the concepts of energy, work, power, the concepts of conservation of energy and be able to perform calculations using them. 4. Understand the concepts of elasticity and be able to perform calculations using them. 5. Understand the concepts of surface tension and viscosity and be able to perform calculations using them6. Use of Bernoulli's theorem in real life problems.7. Demonstrate quantitative problem solving skills in all the topics covered.  ----- After successfully completing this course, the student will be able to do the following: 1. Describe the properties of and relationships between the thermodynamic properties of a pure substance. 2. Describe the ideal gas equation and its limitations. 3. Describe the real

			<p>gas equation. 4. Apply the laws of thermodynamics to formulate the relations necessary to analyze a thermodynamic process. 5. Analyse the heat engines and calculate thermal efficiency. 6. Analyze the refrigerators, heat pumps and calculate coefficient of performance. 7. Understand property 'entropy' and derive some thermo dynamical relations using entropy concept. 8. Understand the types of thermometers and their usage.</p> <p>.</p>
	FyBSc	<p>Phy II PH 121 Physics Principles</p> <hr/> <p>PH 122 Electrostatics</p>	<p>On successful completion of this course students will be able to do the following: 1. To demonstrate an understanding of electromagnetic waves and its spectrum. 2. Understand the types and sources of electromagnetic waves and applications. 3. To understand the general structure of atom, spectrum of hydrogen atom. 4. To understand the atomic excitation and LASER principles. 5. To understand the bonding mechanism in molecules and rotational and vibrational energy levels of diatomic molecules. 6. To demonstrate quantitative problem solving skills in all the topics covered</p> <p>-----</p> <p>On successful completion of this course students will be able to do the following: 1. Demonstrate an understanding of the electric force, field and potential, and related concepts, for stationary charges. 2. Calculate electrostatic field and potential of simple charge distributions using Coulomb's law and Gauss's law. 3. Demonstrate an understanding of the dielectric and effect on dielectric due to electric field. 4. Demonstrate an understanding of the magnetic field for steady currents using Biot-Savart and Ampere's laws. 5. Demonstrate an understanding of magnetization of materials. 6. Demonstrate quantitative problem solving skills in all the topics covered.</p>
	F.Y. B. Sc	Zoology Paper I (ZY-101) Animal Systematics and Diversity I and II	<p>1. To study one invertebrate type animal, e.g. earthworm Learning outcome: Learners will get an idea of general characteristics and details of invertebrate animal systems.</p> <p>2. To provide thorough knowledge about various animal sciences from primitive to highly evolved animal groups</p> <p>3. To introduce basic concepts of invertebrate classification in animal kingdom from phylum protozoa to annelida. To study general characteristics and salient features of animals.</p> <p>4. Learners will get an idea of higher groups of invertebrate animal life and their classification.</p>

			5. To inculcates interest and foundation for further studies in Zoology
F.Y. B. Sc	Zoology Paper II(ZY-102) Fundamentals of Cell Biology and Genetics		<ol style="list-style-type: none"> <li>1. Students will be able to apply biological theories and concepts to novel problems in genetics, evolution, and systematic.</li> <li>2. Students come to know the fundamental features of prokaryotic and eukaryotic cells and methods used to examine them.</li> <li>3. They understood structure, composition and role of cell and cell organelles.</li> <li>4. They understood various concept like Mendelian inheritance, Gene Interaction, Multiple Alleles and Sex-determination</li> <li>5. Student get familiar with scientific and technical knowledge of genetics, evolution, and systematics on human society and the environment.</li> </ol>
F.Y. B.Sc. Sem I & II	Physical & Inorganic Chemistry		<ol style="list-style-type: none"> <li>1) Understanding of behavior of gases, ideal gas as a model system and its extension to real gases. The dependence of physical state on pressure, volume and temperature is being realized.</li> <li>2) Existence of liquid state, comparison of its properties with other states is to be perceived. Liquid crystal are essentials in all common and research devices and instruments hence they are introduced briefly.</li> <li>3) Theoretical basis of adsorption phenomena is integrated. Understanding dynamic nature of surface and its applications in catalysis and in dispersed phases will lead to new area of nanoscience.</li> <li>4) Mathematical background required for derivations, depictions and problem solving. This chapter strengthens these aspects.</li> </ol>

		Organic & Inorganic Chemistry	<p>1. Understanding fundamental concepts which govern the structure, bonding, properties and reactivities of organic molecules such as covalent character, hybridization, bond angles, bond energies, bond polarities and shapes of molecules.</p> <p>2) Application of Huckel's rule to different organic compounds to find out aromatic /non aromatic characters.</p> <p>3) Concept of isomerism, types of isomers and representation of organic molecules.</p> <p>4). Conformational isomerism in alkanes with energy profile diagram.</p> <p>5) Concept of geometrical isomerism with E/Z nomenclature. 6) Understanding of optical activity, isomer number, tetrahedral carbon atom, concept of chirality, enantiomerism, R/S nomenclature for single chiral centre.</p>
F.Y Bsc (Sem-I)	1	Paper –I ( Plant Diversity)	<ol style="list-style-type: none"> <li>1. Study basic concept of Evolution of diversity of plants.</li> <li>2. Study bysystematics and phylogeny of cryptogams and phanerogams.</li> <li>3. Conservation of plants diversity focusing on plants conservation.</li> <li>4. Discuss natural and managed ecosystem at local, regional, and global levels.</li> </ol>
	2	Paper-II (Industrial Botany)	<ol style="list-style-type: none"> <li>1. Introduce various types of nursery's in our students.</li> <li>2. Knowledge of industry in their future business.</li> <li>3. Methods of cultivation of Mushrooms.</li> <li>4. In Floriculture industry.</li> </ol>
(Sem-II)	3	Paper –I ( Plant Morphology and plant Anatomy)	<ol style="list-style-type: none"> <li>1. Discuss the types of Inflorescence with example.</li> <li>2. Describe modification of root and stems.</li> <li>3. Study anatomical and histological structure of vegetative and reproductive plant organ.</li> <li>4. Isolate phytoconstituents from plant extract and spectral and other methods.</li> </ol>
	4	Paper—II ( Industrial botany)	<ol style="list-style-type: none"> <li>1. Development of world class human resources for the relevant research institute.</li> <li>2. Importance of plants in Biofuel industry and its isolation.</li> <li>3. Preparation of bio fertilizer and bio pesticide in industry from plants.</li> <li>4. Types of fruit processing and their preservation technique.</li> </ol>

F.Y. B.Sc. Sem I & II	Physical & Inorganic Chemistry	<p>1) Understanding of behavior of gases, ideal gas as a model system and its extension to real gases. The dependence of physical state on pressure, volume and temperature is being realized.</p> <p>2) Existence of liquid state, comparison of its properties with other states is to be perceived. Liquid crystal are essentials in all common and research devices and instruments hence they are introduced briefly.</p> <p>3) Theoretical basis of adsorption phenomena is integrated. Understanding dynamic nature of surface and its applications in catalysis and in dispersed phases will lead to new area of nanoscience.</p> <p>4) Mathematical background required for derivations, depictions and problem solving. This chapter strengthens these aspects.</p>
	Organic & Inorganic Chemistry	<p>1. Understanding fundamental concepts which govern the structure, bonding, properties and reactivities of organic molecules such as covalent character, hybridization, bond angles, bond energies, bond polarities and shapes of molecules.</p> <p>2) Application of Huckel's rule to different organic compounds to find out aromatic /non aromatic characters.</p> <p>3) Concept of isomerism, types of isomers and representation of organic molecules.</p> <p>4). Conformational isomerism in alkanes with energy profile diagram.</p> <p>5) Concept of geometrical isomerism with E/Z nomenclature. 6) Understanding of optical activity, isomer number, tetrahedral carbon atom, concept of chirality, enantiomerism, R/S nomenclature for single chiral centre.</p>
F.Y. B.Sc. Sem I & II	Physical & Inorganic Chemistry	<p>1) Understanding of behavior of gases, ideal gas as a model system and its extension to real gases. The dependence of physical state on pressure, volume and temperature is being realized.</p> <p>2) Existence of liquid state, comparison of its properties with other states is to be perceived. Liquid crystal are essentials in all common and research devices and instruments hence they are introduced briefly.</p> <p>3) Theoretical basis of adsorption phenomena is integrated. Understanding dynamic nature of surface and its applications in catalysis and in dispersed phases will lead to new area of nanoscience.</p> <p>4) Mathematical background required for derivations, depictions and problem solving. This chapter strengthens these aspects.</p>

		Organic & Inorganic Chemistry	<p>1. Understanding fundamental concepts which govern the structure, bonding, properties and reactivities of organic molecules such as covalent character, hybridization, bond angles, bond energies, bond polarities and shapes of molecules.</p> <p>2) Application of Huckel's rule to different organic compounds to find out aromatic /non aromatic characters.</p> <p>3) Concept of isomerism, types of isomers and representation of organic molecules.</p> <p>4).Conformational isomerism in alkanes with energy profile diagram.</p> <p>5) Concept of geometrical isomerism with E/Z nomenclature. 6) Understanding of optical activity, isomer number, tetrahedral carbon atom, concept of chirality, enantiomerism, R/S nomenclature for single chiral centre.</p>
	F.Y . BSC	Physical chemistry	<p>After studying this chapter, students should be able to</p> <p>1) Solve the problems based on differentiation of a function with power, addition subtraction, logarithmic function etc.</p> <p>2) addition subtraction, logarithmic function etc.</p> <p>3) addition subtraction, logarithmic function etc.</p> <p>4) addition subtraction, logarithmic function etc.</p> <p>5) Define compressibility factor 'Z' and Boyle temp.</p>

**S.Y.B.Sc.**

Class	Sr.no	Sub Name/Course Name	Outcomes
<p><b>S.Y.B.Sc</b></p> <p><b>Sem -1</b></p>	1	<p>Subject Name : <b>Multivariable Calculus I</b>                      Course code: : MT 211</p>	<p>1)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting.</p> <p>2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p> <p>3) A student take be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays ,state important facts resulting from their studies.</p> <p>4) A student takes relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.</p>
	2	<p>Subject Name: <b>Laplace Transform and Fourier Series</b>                      CourseCode:MT212(B)</p>	<p>1 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.</p> <p>2) students develop a positive attitude towards mathematics as aninteresting and valuable subject of study.</p> <p>3)student prepare the mathematical models related to basic mathematics.</p>
<p><b>Sem -2</b></p>		<p>Subject Name: <b>Linear Algebra</b>                      Course Code: MT 221</p>	<p>1) A students apply their skills and knowledge ,that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.</p> <p>2) A student takes relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.</p> <p>3)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting</p>

		<p>Subject Name: <b>Multivariable Calculus II</b> Course Code: MT222(A)</p>	<p>1) Students Solve the mathematical problem by using appropriate mathematical formulae or techniques.</p> <p>2) students enhanced overall development and to equip them with mathematical modeling abilities, problem solving skills , creative talent and power of communication.</p> <p>3) students acquired knowledge of basic mathematics</p>
SyBSc	<p>Phy I PH211 MMP</p> <p>-----</p> <p>PH212 Waves and Oscillation</p>	<p>After the completion of this course students will be able to Understand the complex algebra useful in physics courses •Understand the concept of partial differentiation. •Understand the role of partial differential equations in physics •Understand vector algebra useful in mathematics and physics .Understand the singular points of differential equation.</p> <p>-----</p> <p>Understand the physics and mathematics of oscillations. •Solve the equations of motion for simple harmonic, damped, and forced oscillators. •Formulate these equations and understand their physical content in a variety of applications, •Describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion.</p> <ul style="list-style-type: none"> <li>•Explain oscillation in terms of energy exchange, giving various examples.</li> <li>•Solve problems relating to undamped, damped and forced oscillators and superposition of oscillations. •Understand the mathematical description of travelling and standing waves.</li> <li>•Recognise the one-dimensional classical wave equation and solutions to it. •Calculate the phase velocity of a travelling wave.</li> <li>•Explain the Doppler effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer. •Define the decibel scale qualitatively, and give examples of sounds at various levels. •Explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments</li> </ul>	
	<p>Phy II PH 221 Electronics</p> <p>-----</p> <p>PH222 Optics</p>	<p>Apply laws of electrical circuits to different circuits. •Understand the relations in electricity •Understand the properties and working of transistors. •Understand the functions of operational amplifiers .Design circuits using transistors and operational amplifiers. •Understand the Boolean algebra and logic circuits.</p> <p>Learning Outcomes</p> <p>-----</p> <p>This course will enable you to: acquire the basic concepts of wave optics •describe how light can constructively and destructively interfere •explain why a light beam spreads out after passing through an aperture •summarize the polarization characteristics of</p>	



			<p>electromagnetic waves •appreciate the operation of many modern optical devices that utilize wave optics •Understand optical phenomena such as polarisation, birefringence, interference and diffraction in terms of the wave model. •analyse simple examples of interference and diffraction phenomena. •be familiar with a range of equipment used in modern optics.</p>
S.Y. B. Sc	Zoology Paper I (ZY-211): Animal Systematics and Diversity -III and IV	<ol style="list-style-type: none"> <li>1. To equipped the students with skills related to laboratory as well as field based studies</li> <li>2. To make the students aware about conservation and sustainable use of biodiversity</li> <li>3. We produce graduates with the ability to become autonomous learners equipped cope with higher degree studies</li> <li>4. A successful student in this course should be able to Understand the diversity and evolutionary relationships among animals</li> <li>5. The Student get knowledge of the basic structure and function of different groups of invertebrates and vertebrates</li> </ol>	
S.Y. B. Sc	Zoology Paper II( ZY-212): Applied Zoology I and II	<ol style="list-style-type: none"> <li>1. To make the students aware of applications of Zoology subject in various industries To highlight the potential of various branches to become an entrepreneur</li> <li>2. To address the socio-economical challenges related to animal sciences</li> <li>3. Student gets broad, relevant and contemporary curriculum, enriched by the scholarly activity and skill.</li> <li>4. It provide opportunities for practical work practical skills in laboratory-based and field zoology.and experiential learning in aspects of Applied Zoology</li> </ol>	

S.Y.B. Sc. Sem I	Physical & Analytical chemistry	<p>1) Student should learn Concept of kinetics, terms used, rate laws, types of order. Discuss examples of first order and second order reaction. Pseudo molecular reactions. Factors affecting rate of reaction. Techniques of measurement of rate of reaction.</p> <p>2). Understand difference between thermal and photochemical reactions</p> <p>3) Student should learn Classification of errors</p> <p>4) Student should learn Basic principles in qualitative analysis. ii. Meaning of common ion effect. iii. Role of common ion effect and solubility product</p> <p>5) Classification of compounds with different functional groups. ii. Different tests for detection of elements like C, H, (O), N, S &amp; P. iii. Characteristic tests for different functional groups. iv. Different colour tests and the reactions. v. Quantitative analysis of C, H by Liebig's method</p>
S.Y.B. Sc. Sem I	Organic & Inorganic Chemistry	<ul style="list-style-type: none"> <li>i) Identify chiral center in the given organic compounds. ii) Define Erythro, threo, meso, diastereoisomers with suitable examples. 2) differentiate between properties. 2) differentiate between properties of pig iron and wrought iron. Definition of corrosion. ii) Types of corrosion of pig iron and wrought iron. Definition of corrosion. ii) Types of corrosion. 3) explain the term 3) explain the term pyrometallurgy and to explain the physico-chemical principles involved in the reduction process by carbon monoxide. pyrometallurgy and to explain the physico-chemical principles involved in the 4) To know physico-chemical principles involved in electrometallurgy. reduction process by carbon monoxide) To know physico-chemical principles involved in electrometallurgy.</li> </ul>
S.Y.B. Sc. Sem II	Physical & Analytical chemistry	<p>1) Free energy concepts, types and its variation 2). Free energy 2). Free energy change for chemical reaction and physical transition change for chemical reaction and physical transition change for chemical reaction and physical 3) chemical reaction and physical transition change for chemical reaction and physical transition. Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards physical transition change for chemical reaction and physical transition. Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards. 4) Explain role of indicators. 5) Estimate copper from <math>\text{CuSO}_4</math> and available chlorine in bleaching powder.</p>

S.Y.B. Sc. Sem II	Organic & Inorganic Chemistry	1) Student Known different biomolecules 2) Know the phenomenon of mutarotation. 3) know position of d-block elements in periodic table. ii) To know the general electronic configuration & electronic configuration of elements.
		4) Student learned define acids and bases according to Arrhenius theory Lowery- Bronsted concept, Lewis concept
		5) Student learned know toxic chemical in the environment.
		6) Understand M-C bond and to define organometallic compounds

<b>S.Y Bsc- (Sem-I)</b>	1	Paper – I (Taxonomy of Angiosperms and Plant Community)	<ol style="list-style-type: none"> <li>1. Classify organism into taxonomy on the basis of phenotype and gametophyte.</li> <li>2. Assign the each taxon name.</li> <li>3. Study of factors of evolution to find origin of species.</li> <li>4. Describe taxa and phytography.</li> </ol>
	2	Paper—II (Plant Physiology) BO-212	<ol style="list-style-type: none"> <li>1. Study of How plants Function.</li> <li>2. Understand Biological and chemical process of individual plants cell.</li> <li>3. Interaction of plant cell, Tissue and Organ.</li> <li>4. Study how plants control or regulate identical functional.</li> </ol>
<b>S.Y Bsc ( Sem- II)</b>	3	Paper –I ( Plant anatomy and Embryology) BO-221	<ol style="list-style-type: none"> <li>1. Study internal structure of plants.</li> <li>2. Internal cell organization and arrangements of plants.</li> <li>3. Study Embryo and their development.</li> <li>4. Development of Male and Female gametophyte.</li> </ol>
	4	Paper –II ( Plant Biotechnology)	<ol style="list-style-type: none"> <li>1. Develop a model to introduce and to study expression of genes related to water deficit tolerance.</li> <li>2. Apply biotechnology to the development of company strategies with incidence of florets tress.</li> <li>3. Develop public awareness and professional certification on plants biotechnology.</li> </ol>
S.Y.B. Sc. Sem I		Physical & Analytical chemistry	<ol style="list-style-type: none"> <li>1) Student should learned Concept of kinetics , terms used , rate laws , types of order Discuss examples of first order and second order reaction Pseudo molecular reactions Factors affecting on rate of reaction Techniques of measurement of rate of reaction</li> <li>2). Understand difference between thermal and photochemical reactions</li> <li>3) Student should learned Classification of errors</li> <li>4) Student should learned Basic principles in qualitative analysis ii. Meaning of common ion effect iii. Role of common ion effect and solubility product</li> <li>5) Classification of compounds with different functional groups ii. Different tests for detection of elements like C, H, (O), N, S &amp; P. iii. Characteristic tests for different functional groups iv. Different colour tests and the reactions v. Quantitative analysis of C, H by Liebig's method</li> </ol>

S.Y.B. Sc. Sem I	Organic & Inorganic Chemistry	<p>i) Identify chiral center in the given organic compounds. ii) Define Erythro, threo, meso, diastereoisomers with suitable examples. 2) differentiate between properties of pig iron and wrought iron. Definition of corrosion. ii) Types of corrosion of pig iron and wrought iron. Definition of corrosion. ii) Types of corrosion. 3) explain the term pyrometallurgy and to explain the physico chemical principles involved in the reduction process by carbon monoxide. pyrometallurgy and to explain the physico chemical principles involved in the 4) To know physico-chemical principles involved in electrometallurgy. reduction process by carbon monoxide) To know physico-chemical principles involved in electrometallurgy.</p>
S.Y.B. Sc. Sem II	Physical & Analytical chemistry	<ul style="list-style-type: none"> <li>1) Free energy concepts, types and its variation 2). Free energy 2). Free energy change for chemical reaction and physical transition change for chemical reaction and physical transition change for chemical reaction and physical transition change for chemical reaction and physical transition change for chemical reaction and physical transition. Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards physical transition change for chemical reaction and physical transition. Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards. 4) Explain role of indicators. 5 Estimate copper from <math>\text{CuSO}_4</math> and available chlorine in bleaching powder.</li> </ul>
S.Y.B. Sc. Sem II	Organic & Inorganic Chemistry	<p>1) Student Known different biomolecules 2) Know the phenomenon of mutarotation. 3) know position of d-block elements in periodic table. ii) To know the general electronic configuration &amp; electronic configuration of elements.</p>
		<p>4) Student learned define acids and bases according to Arrhenius theory Lowery- Bronsted concept, Lewis concept 5)</p>

			5) Student learned know toxic chemical in the environment.
			6) Understand M-C bond and to define organometallic compounds
S.Y.B. Sc. Sem I	Physical & Analytical chemistry	<p>1) Student should learned Concept of kinetics , terms used , rate laws , types of order Discuss examples of first order and second order reaction Pseudo molecular reactions Factors affecting on rate of reaction Techniques of measurement of rate of reaction</p> <p>2). Understand difference between thermal and photochemical reactions</p> <p>3) Student should learned Classification of errors</p> <p>4) Student should learned Basic principles in qualitative analysis ii. Meaning of common ion effect iii. Role of common ion effect and solubility product</p> <p>5) Classification of compounds with different functional groups ii. Different tests for detection of elements like C, H, (O), N, S &amp; P. iii. Characteristic tests for different functional groups iv. Different colour tests and the reactions v. Quantitative analysis of C, H by Liebig's method</p>	
S.Y.B. Sc. Sem I	Organic & Inorganic Chemistry	<ul style="list-style-type: none"> <li>i) Identify chiral center in the given organic compounds. ii) Define Erythro, threo, meso, diastereoisomers with suitable examples. 2) differentiate between properties .2) differentiate between properties of pig iron and wrought iron Definition of corrosion. ii) Types of corrosion of pig iron and wrought iron Definition of corrosion. ii) Types of corrosion. 3) explain the term 3) explain the term pyrometallurgy and to explain the physico chemical principles involved in the reduction process by carbon monoxide. pyrometallurgy and to explain the physico chemical principles involved in the 4) To know physico-chemical principles involved in electrometallurgy. reduction process by carbon</li> </ul>	

			monoxide)To know physico-chemical principles involved in electrometallurgy.
S.Y.B. Sc. Sem II	Physical & Analytical chemistry	1)Free energy concepts, types and its variation 2). Free energy 2). Free energy change for chemical reaction and physical transition change for chemical reaction and physical transition change for chemical reaction and physical 3) chemical reaction and physical transition change for chemical reaction and physical transition. Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards physical transition change for chemical reaction and physical transition. Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards.4) Explain role of indicators.5 Estimate copper from CuSO4 and available chlorine in bleaching powder.	
S.Y.B. Sc. Sem II	Organic & Inorganic Chemistry	1`)Student Known different biomolecules 2)Know the phenomenon of mutarotation.3) know position of d-block elements in periodic table. ii) To know the general electronic configuration & electronic configuration of elements.	
		4) Student learned define acids and bases according to Arrhenius theory Lowery- Bronsted concept, Lewis concept5)	

			5) Student learned know toxic chemical in the environment.
			6) Understand M-C bond and to define organometallic compounds
	S.Y.Bsc	Organic Inorganic Chemistry	<ol style="list-style-type: none"><li>1) To know different reactions in the blast furnace.</li><li>2) To differentiate between properties of pig iron and wrought iron.</li><li>3) To differentiate between ore and minerals.</li><li>4) To differentiate between calcination and roasting and smelting.</li></ol>



### T.Y. B.Sc. (Mathematics) SEM-III

Class	Sr.no	Sub Name/Course Name	Outcomes
T.Y.B.Sc	1	Subject Name : <b>Metric Spaces</b> Course code: MT 331	<p>1)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting.</p> <p>2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p> <p>3) A student take be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays ,state important facts resulting from their studies.</p> <p>.</p>
Sem-3	2	Subject Name: <b>Real Analysis-I</b> Course Code: MT 332	<p>1 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.</p> <p>2) students develop a positive attitude towards mathematics as aninteresting and valuable subject of study.</p> <p>3)student prepare the mathematical models related to basic mathematics.</p>

	<p>3</p> <p><b>Subject Name : Problem Course on MT 331 and MT 332</b></p> <p>Course Code: MT 333</p>	<p>1) A students apply their skills and knowledge ,that is, translateinformation presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.</p> <p>2 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.</p> <p>3)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting</p>
	<p>4</p> <p><b>Subject Name :Group Theory</b></p> <p>Course Code: MT 334</p>	<p>1 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.</p> <p>2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p>

5	<p>Subject Name :  <b>Ordinary Differential Equations</b></p> <p>Coursre Code: MT 335</p>	<p>1)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting.</p> <p>2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p>
6	<p>Subject Name :  <b>Problem Course on MT 334 and MT 334</b></p> <p>Coursre Code: MT 336</p>	<p>1) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p>
7	<p>Subject Name :  <b>Operations Research</b></p> <p>Coursre Code: MT 337:A</p>	<p>1 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.</p>

	8	<p><b>Subject Name : Number Theory</b></p> <p>Course Code: MT:337:F</p>	<p>1) student prepare the mathematical models related to basic mathematics.</p>
<b>T.Y.B.Sc</b>	1	<p><b>Subject Name : Complex Analysis</b></p> <p>Course code: MT 341</p>	<p>1) the students take a sufficient knowledge of fundamental principles, methods and a clear perception of the innumerable power of mathematical ideas and tools and know how to use them by modeling, solving and interpreting.</p> <p>2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p> <p>3) A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.</p> <p>.</p>
<b>Sem-4</b>	2	<p><b>Subject Name: Real Analysis-II</b></p> <p>Course Code: MT 342</p>	<p>1) A student should know the history of mathematics and hence of its past, present and future role as part of our culture.</p> <p>2) students should develop a positive attitude towards mathematics as an interesting and valuable subject of study.</p> <p>3) student prepare the mathematical models related to basic mathematics.</p>

	<p>3</p>	<p><b>Subject Name : Problem Course on MT 341 and MT 342</b>  Coursre Code: MT 343</p>	<p>1) A students apply their skills and knowledge ,that is, translateinformation presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.</p> <p>2 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.</p> <p>3)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting</p>
	<p>4</p>	<p><b>Subject Name :Ring Theory</b>  Coursre Code: MT 344</p>	<p>1 ) A student know the of history of mathematics and hence of its pastpresent and future role as part of our culture.</p> <p>2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p>

	5	<p>Subject Name: <b>Partial Differential Equations</b>  Course Code : MT 345</p>	<p>1)the students takes a sufficient knowledge of fundamental principles ,methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling ,solving and interpreting.</p> <p>2) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p>
	6	<p>Subject Name: <b>Problem Course on MT 344 and MT 345</b>  Course Code: MT 346</p>	<p>1) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.</p>
	7	<p>Subject Name: Graph theory  Course Code: MT 347: D</p>	<p>1) Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science</p>

	8	<p>Subject Name: Computational Geometry</p> <p>Course Code: MT 347:F</p>	<p>2) students develop a positive attitude towards mathematics as an interesting and valuable subject of study.</p> <p>3) student prepare the mathematical models related to basic mathematics.</p>
1	TyBSc	PH-331: Mathematical Methods in Physics II	<p>After the completion of this course students will be able to Understand the complex algebra useful in physics courses</p> <ul style="list-style-type: none"> <li>•Understand the concept of partial differentiation.</li> <li>•Understand the role of partial differential equations in physics</li> <li>•Understand vector algebra useful in mathematics</li> </ul>
2		PH 332 Solid State Physics	<p>After the completion of this course students will be able to Understand the basic concepts of solid state matter. As well as they can find out miller indices. Students gets acquainted with x ray diffraction .</p>
3		PH 333 Classical Mechanics	<p>Have a deep understanding of Newton's laws,</p> <ul style="list-style-type: none"> <li>•Be able to solve the Newton equations for simple configurations using various methods,</li> </ul>
4		PH 334 Atomic and Molecular Physics	<p>On successful completion of this course students will be able to study <a href="#">atoms</a> as an isolated system of <a href="#">electrons</a> and an <a href="#">atomic nucleus</a>. It is primarily concerned with the <a href="#">arrangement of electrons around the nucleus</a> and the processes by which these arrangements change. This comprises <a href="#">ions</a>, neutral atoms and, unless otherwise stated, it</p>

			can be assumed that the term <i>atom</i> includes ions.
5		PH 335 Computational Physics	After the completion of this course students will be able to Understand the basic concepts of C programming. As well as they can find out solutions to complicated equations using C program. Computer graphics can be studied using this programming.
6		PH 336 B Elements of Materials Science	Students who completed this course should •Have a basic understanding of the Standard Model and of theoretical methods employed in material physics, • Be familiar with main theoretical concepts and experimental techniques used in material physics, • Be able to understand various forms and compositions inside the material.
7		PH341 Classical Electrodynamics	Students who completed this course should •Have a deep understanding of the theoretical foundations of electromagnetic phenomena, •Be able to solve the Maxwell equations for simple configurations, •Have a working knowledge of special relativity
8		PH342 Quantum Mechanics	Students who completed this course should •Have a deep understanding of the mathematical foundations of quantum mechanics, •Be able to solve the Schrödinger equation for simple configurations, •Understand the effect of symmetries in quantum
9		PH343 Thermodynamics and Statistical Physics	Students who have completed this course should •Have a deep understanding of physical statistics and its relation to information theory, •Be able to solve statistical mechanics problems for simple non-interacting systems, •Have a basic understanding of the phase transitions, •Be able to use linear response theory and kinetic equation approach
10		PH344 Nuclear Physics	Students who have completed this course should •Have a phenomenological understanding of strong interactions starting from QCD, •Be familiar with many-body physics, •Be able to make quantitative estimates for nuclear phenomena in relation to the underlying microscopic theory.
11		PH345 Electronics	Understand the properties and working of transistors. •Understand the functions of operational amplifiers .Design circuits using transistors and operational amplifiers. •
12		PH346 K Lasers	On successful completion of this course students will be able to study the characteristics of LASERS. Their types and applications in various fields of science.
<b>T.Y Bsc.</b>	<b>1</b>	Paper I (Plant Physiology and	1)It was very important to know the functions of a living



<b>(Sem-II)</b>		Biochemistry) Course code – BO.341	organisms or any of its parts. 2)The main objective of this course was to understand how plant live and functions. 3) To demonstrate knowledge and understanding as the molecular machinery of living cell. 4)Studied basic princiles and basic mechanisms of metabolic control and molecular signaling.
	<b>2</b>	Paper II (Plant Ecology and Biodiversity) Course code – BO.342	1)Knowledge about the interaction between biotic and abiotic factor of environment. 2)Adaptations of plant in different types of environmental conditions 3)To understand the nature of environmental influences on individual organisms, their populations and communities on Ecoscapes 4)The interrelationship between organisms in population and communities.
	<b>3</b>	Paper II (Plant Pathology) course code – BO.343	1)To studied the diseases or disorders caused by biotic and abiotic agent 2)To studied mechanisms of diseases development by pathogens. 3)Studied of interactions between plant and pathogen in relation to the overall environment. 4)Developed suitable management strategies for managing the diseases and losses caused by them.
	<b>4</b>	Paper IV (Medicinal and Economic Botany) Course code – BO.344	1)It was important for pharmaceuticals. 2)It was important in Ayurveda. 3)In Economic to identify evaluated the economic important of medicinal plants. 4)Studied of relationship between people and plants.
	<b>5</b>	Paper V(Plant biotechnology ) Course code – BO.345	1)To studied of applicatuion of science and technology to plants. 2)Improvement of varieties according to relevant agronomic features. 3)Natural diversity exploitation and biodiversity protection 4)Knowledge about biofactories.
	<b>6</b>	Paper VI ( Plant breeding and Seed Technology) Course code – BO.346	1)The prime aim of plant breeding was to improved the characteristics of plant. 2)To improved the seed varieties,seed qualities etc. 3)To improved the plant varieties . 4)To studied the hybridization technique.
<b>TYBSc Inorganic Chemistry</b>	1	Semester-III, Course: Inorganic Chemistry (CH-332) Chapter - 1	1)attempted to make students to know the theories of covalent bond formation 2)attempted to make students Know the assumptions and limitations of VBT 3)attempted to make students Understand the need of concept of MOT

			<p>4) attempted to make students Know LCAO principal and its approximation</p> <p>5) attempted to make students Understand and show the formation of bonding and antibonding MO's</p> <p>6) attempted to make students Draw the shapes of s, p, d orbital</p> <p>7) attempted to make students Draw combinations of s-s, s-p, p-p and d-d orbital to form <math>\sigma</math> and <math>\pi</math> molecular orbitals.</p>
2	Semester-III, Course: Inorganic Chemistry (CH-332) Chapter - 2	<p>1) attempted to make students Know the meaning of various terms involved in coordination chemistry.</p> <p>2) attempted to make students Know the different types of Ligands.</p> <p>3) attempted to make students Understand the chelating agents, chelate and stability of chelates and complexes.</p> <p>4) attempted to make students Calculate the charge on complex ion and the oxidation number.</p> <p>5) attempted to make students Be able to give the IUPAC name the co-ordination compound.</p> <p>6) attempted to make students Know the application of co- ordination compounds in biology and chemistry.</p> <p>7) attempted to make students Be able to understand the Werner's formulation of complexes and identify the ionizable ions.</p> <p>8) attempted to make students Be able to distinguish between ionizable and non-ionizable valencies with suitable examples.</p> <p>9) attempted to make students Give the suitable physical and chemical test for identification of number and types of ionizable ions.</p> <p>10) attempted to make students Be able to draw the geometrical and optical isomerism of complexes.</p> <p>11) attempted to make students Choose the correct geometry for complexes with C.N. 4 and C.N. 6 with the help of stereoisomerism.</p> <p>12) attempted to make students Be able to define and explain isomerism in complexes.</p> <p>13) attempted to make students Be able to explain various types of isomerism.</p> <p>14) attempted to make students Comment on the stereoisomerism in complexes with C.N. 4 and C. N. 6.</p> <p>15) attempted to make students Define EAN rule and calculate EAN value of the complexes.</p> <p>16) attempted to make students Comment on EAN value and stability of complexes.</p>	

			<p>17) attempted to make students Know the merits and the demerits of Sidgwick's theory.</p> <p>18) attempted to make students Be able to explain the need of concept of hybridization.</p> <p>19) attempted to make students Explain the VB representation of tetrahedral, square planar, trigonalbipyramidal and octahedral complexes.</p> <p>20) attempted to make students Be able to identify which d-orbitals are involved in hybridization during formation of complexes with different geometries such as tetrahedral, square planar, trigonalbipyramidal and octahedral.</p> <p>21) attempted to make students Be able to explain structure and magnetic behaviour of the complexes.</p> <p>22) attempted to make students Be able to identify the high spin and low spin complexes.</p> <p>23) attempted to make students Be able to identify inner orbital and outer orbital complexes.</p> <p>24) attempted to make students Explain elctroneutrality principle and different types of pi bonding.</p> <p>25) attempted to make students Know the limitations of VBT.</p> <p>26) attempted to make students Know the shapes of d-orbitals and degeneracy of d-orbitals.</p> <p>27) attempted to make students Know the assumptions of CFT.</p> <p>28) attempted to make students Understand how splitting of d-orbitals occurs when ligand approaches.</p> <p>29) attempted to make students Be able to draw crystal filled splitting diagrams of d orbital of metal ion in octahedral, tetrahedral, square planer of tetragonal ligand field.</p> <p>30) attempted to make students Interpret the spectra of complexes and calculate the <math>10 Dq</math>.</p> <p>31) attempted to make students Understand the factors affecting magnitude of <math>10 Dq</math>.</p> <p>32) attempted to make students Be able to find high spin and low spin complexes when <math>10 Dq</math> and pairing energy are given.</p> <p>33) attempted to make students Be able to explain d-d transitions and colour of the complexes.</p> <p>34) attempted to make students Know the conditions under which Jahn-Teller distortion occurs.</p> <p>35) attempted to make students Explain, why Jahn-Teller</p>
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			<p>distortion should occur in Oh complexes?</p> <p>36) attempted to make students Be able to explain Nephelauxetic effect towards covalent bonding.</p> <p>37) attempted to make students Explain MOT of Octahedral complexes with sigma bonding.</p> <p>38) attempted to make students Be able to explain Charge Transfer Spectra.</p> <p>39) attempted to make students Be able to compare the different approaches to bonding in Coordination compounds.</p>
	3	Semester-IV, Course: Inorganic Chemistry (CH-342) Chapter - 1	<p>1) introduced to students The meaning of term f-block elements, Inner transition elements, lanthanides, actinides.</p> <p>2) introduced to students Electronic configuration of lanthanides and actinides.</p> <p>3) introduced to students Oxidation states of lanthanides and actinides and common oxidation states.</p> <p>4) introduced to students Separation lanthanides by modern methods.</p> <p>5) introduced to students Lanthanide contraction and effects of lanthanide contraction on post-lanthanides.</p> <p>6) introduced to students Use of lanthanide elements in different industries.</p> <p>7) introduced to students about Transuranic elements.</p> <p>8) introduced to students about Preparation methods of transuranic elements.</p> <p>9) introduced to students about Nuclear fuels and their applications.</p> <p>10) introduced to students about transuranic elements are called as the synthetic elements?</p> <p>11) introduced to students about IUPAC nomenclature for super heavy elements with atomic no. 100 onwards.</p>
	4	Semester-IV, Course: Inorganic Chemistry (CH-342) Chapter - 2	<p>a. introduced to students about The meaning of metal &amp; semiconductor.</p> <p>b. introduced to students about The difference between metal, semiconductor and insulator.</p> <p>c. introduced to students about Metallic bond on the basis of band theory.</p> <p>d. introduced to students about The energy band and energy curve.</p> <p>e. introduced to students about Draw <math>n(E)</math> &amp; <math>N(E)</math> curves.</p> <p>f. introduced to students about Explain the electrical conductivity of metals with respect to valence electrons.</p>

			<p>g. introduced to students about Explain the effect of temperature and impurity on conductivity of metals and semiconductors.</p> <p>h. introduced to students about Intrinsic and extrinsic semiconductor.</p> <p>i. introduced to students about The term valance band and conduction band.</p> <p>j. introduced to students about n and p type of semiconductors.</p> <p>k. introduced to students about Non-stoichiometry and semi conductivity.</p> <p>l. introduced to students about Insulators on the basis of band theory.</p> <p>m. introduced to students about The difference between Na, Mg, and Al in terms of valence electrons and conductivity.</p> <p>n. introduced to students about Meaning of super conductors and their structure.</p> <p>o. introduced to students about Discovery and applications of superconductors.</p>
	5	Semester-IV, Course: Inorganic Chemistry (CH-342) Chapter - 3	<p>i. introduced to students about Know the nature of solids.</p> <p>ii. introduced to students about Know the crystal structures of solids.</p> <p>iii. introduced to students about Draw the simple cubic, BCC and FCC structures.</p> <p>iv. introduced to students about Identify the C.N. of an ion in ionic solid.</p> <p>v. introduced to students about Identify the type of void.</p> <p>vi. introduced to students about Know the effect of radius ratio in determining the crystal structure.</p> <p>vii. introduced to students about Be able to define Pauling's univalent radius and crystal radius.</p>
	6	Semester-IV, Course: Inorganic Chemistry (CH-342) Chapter - 4	<p>i. introduced to students about Define the homogeneous catalysis.</p> <p>ii. introduced to students about Give examples of homogeneous catalysis.</p> <p>iii. introduced to students about Understand the essential properties of homogeneous catalysts-Give the catalytic reactions for Wilkinson's Catalysis, Zeigler Natta Catalysis, Monsanto acetic acid synthesis</p> <p>iv. introduced to students about Give the brief account of homogeneous catalysis.</p>

	7	Semester-IV, Course: Inorganic Chemistry (CH-342) Chapter - 5	<ul style="list-style-type: none"> <li>i. introduced to students about Define the heterogeneous catalyst and heterogeneous catalysis.</li> <li>ii. introduced to students about Give examples of heterogeneous catalysts.</li> <li>iii. introduced to students about Understand the essential properties of heterogeneous catalysts.</li> <li>iv. introduced to students about Give the catalytic reactions for oxidation, reduction and cyclization processes.</li> <li>v. introduced to students about Give the brief account of biodiesel synthesis using heterogeneous catalysis.</li> <li>vi. Enlist the catalysts used for benzimidazole synthesis.</li> </ul>
	8	Semester-IV, Course: Inorganic Chemistry (CH-342) Chapter - 6	<ul style="list-style-type: none"> <li>i. introduced to students about Identify the biological role of inorganic ions &amp; compounds.</li> <li>ii. introduced to students about Know the abundance of elements in living system and earth crust.</li> <li>iii. introduced to students about the classification of metals as enzymatic and non-enzymatic.</li> <li>iv. introduced to students about Understand the role of metals in non-enzymatic processes.</li> <li>v. introduced to students about the metalloproteins of iron.</li> <li>vi. introduced to students about the functions of hemoglobin and myoglobin in O<sub>2</sub> transport and storage.</li> <li>vii. introduced to students about Understand the toxicity of CN- and CO binding to Hb.</li> <li>viii. introduced to students about Draw the structure of Vit.B<sub>12</sub> and give its metabolism.</li> </ul>
<b>TYBSc Agriculture Chemistry</b>	1	Semester-III Course: Agriculture Chemistry (CH-336E)	<p>Learning Objectives of Agriculture Chemistry,</p> <ul style="list-style-type: none"> <li>1. Attempted to make them to Know the role of agriculture chemistry and its potential</li> <li>2. Attempted to Understand them basic concept of soil, properties of soil &amp; its classification on the basis of pH</li> <li>3. Attempted to make them to Know the different plant nutrients, Their functions and deficiency symptoms</li> <li>4. Attempted to make them to Understand importance of manures as compared to chemical fertilizers'</li> <li>5. Attempted to make them to Understand the importance of green manuring</li> <li>6. Attempted to make them to the knowledge of the use of proper the plants</li> <li>7. Attempted to make them to Know various techniques to protect the plants</li> <li>8. Attempted to make them to Have the knowledge of various pesticides, insecticides, fungicides and herbicides</li> <li>9. Attempted to make them to Identify the problematic</li> </ul>

			soil and recommend method for their reclamation 10. Attempted to make them to Have the knowledge of quality irrigation water, water quality standard and analysis of irrigation water
	2	Semester-IV Course: Dairy Chemistry (CH-336E)	1. Attempted to make them to Know importance of the subject from the point of rural economy. 2. Attempted to make them to Know the composition of milk, its food & nutritive value 3. Attempted to make them to Understand the Microbiology of the milk 4. Attempted to make them to Understand various preservation and adulterants, various milk proteins and their role for the human body. 5. Attempted to make them to Know various milk products, their composition, manufacture and uses.
<b>TYBSc Analytical Chemistry</b>			<ol style="list-style-type: none"> <li>Principles of common ion effect and solubility product. Formation of complex ion. Factors affecting on solubility of precipitation. Phenomenon of super saturation and precipitation formation. Meaning of co-precipitation and post precipitation. Choice of liquid for washing the precipitate. Precautions during filtration, drying and ignition of precipitate. Conceptual understanding of electrogravimetric principle.</li> <li>Methods of thermo gravimetric analysis. Principles of TGA and DTA. Types of TGA. Relation between TGA and DTA. Thermal equation of TGA. Different factors affecting TGA curve. Determination of calcium oxalate precursor 8. Applications of TGA, DTA and DSC.</li> <li>Principles of Spectrophotometric analysis and properties of electromagnetic radiations. Different Terms like absorbance, transmittance, and molar absorptivity. Mathematical Statement and derivation of Lambert's Law and Beer's Law. Different wavelength selectors and their importance. Instrumentation and working of single and double beam spectrophotometer. Additivity Principle. Different methods of color comparators. Applications</li> <li>Voltammetry and polarography as an analytical tool. Construction, working, advantages and disadvantages of DME. Different terms involved</li> </ol>

			<p>in Ilkovic equation. Determination of Zn and Cd from the mixture. Significance of the different terms involved. Need of removal of dissolved oxygen from analyte solution</p> <ol style="list-style-type: none"> <li>5. Atomic absorption spectroscopy as an analytical tool. Measurement of absorbance of atoms by AAS. Interferences in atomic absorption spectroscopy. Applications and numerical problems.</li> <li>6. Emission spectroscopy as an analytical tool. Measurement of emission of atomic species. Different methods of analysis. Application and numerical problems.</li> <li>7. Principles of solvent extraction. Difference between KD and D. Various types of techniques of solvent extraction such as- (a) extraction (b) continuous extraction (c) counter current extraction. Difference between batch and multiple extraction. Advantages and applications of solvent extraction. To solve the numerical problems.</li> <li>8. Principle of chromatographic methods. Relation between theoretical plates and column efficiency. Technique and applications of- Column Chromatography. Technique and applications of- Thin layer Chromatography. Technique and applications of- Paper Chromatography</li> <li>9. Principle of GSC and GLC analysis. Separation mechanism involved in GSC and GLC. Instrumentation- stationary phases, column types, detectors. Working of gas chromatographic apparatus. Chromatogram and use in qualitative-quantitative analysis. Applications of gas chromatography</li> <li>10. Need of liquid chromatography. Separation mechanism involved in adsorption and partition HPLC. Instrumentation and working of HPLC. Applications of HPLC. Advantages of supercritical fluid chromatography</li> </ol>
<b>T.Y Bsc (Sem -I)</b>	1	Paper -I ( Cryptogamic Botany) course code – BO.331	<ol style="list-style-type: none"> <li>1. Studied Non flowering plants on the earth.</li> <li>2. Studied life cycle pattern of the nonflowering plants.</li> <li>3. Studied phylogenetic relationship of gametophytic and sporophyte generation.</li> <li>4. Studied characters of all cryptogamic plants.</li> </ol>



	2	Paper –II(Cell and Molecular biology) course code – BO.332	<ol style="list-style-type: none"> <li>1. Studied structure of cell and cell organelles.</li> <li>2. How cell communicate to each other.</li> <li>3. Studied nucleic acids (DNA AND RNA)</li> <li>4. Explain the molecular mechanism behind different modes of gene regulations.</li> </ol>
	3	Paper-III ( Genetics and Evolution) course code – BO.333	<ol style="list-style-type: none"> <li>1. Studied heredity and variation.</li> <li>2. Studied all basic gene level concept</li> <li>3. Studied fossilization.</li> <li>4. Find out each gene sequence, mutational changes.</li> </ol>
	4	Paper –IV ( Spermatophytic and Paleobotany) course code – BO.334	<ol style="list-style-type: none"> <li>1. Studied flowering plants and their structure and arrangements.</li> <li>2. Studied which plants in which family included.</li> <li>3. Find out Ancestor of plants.</li> <li>4. Studied fossil form of plants.</li> </ol>
	5	Paper-V(Horticulture and Floriculture) course code – BO.335	<ol style="list-style-type: none"> <li>1. How to cultivate plants and their requirements.</li> <li>2. Studied artificial and natural propagation as well as marketing value.</li> <li>3. Knowledge about the floral arrangement and technique of vase life.</li> <li>4. Industrial value of flower like soap industries ,perfumes industries etc.</li> </ol>
	6	Paper –VI( Computational botany) course code – BO.336	<ol style="list-style-type: none"> <li>1. In statistics to study the various parameters.</li> <li>2. Statistics used in botany to various purposes like stomata number, NO. of plants per area.</li> <li>3. Introduce the students concept and methods use in bio statistical treatment of data.</li> <li>4. Biostatistic provide crucial guidance in determining what information is reliable and which production can be trusted.</li> </ol>
<b>T.Y Bsc. (Sem-II)</b>	<b>1</b>	Paper I (Plant Physiology and Biochemistry) course code – BO.341	<ol style="list-style-type: none"> <li>1) It was very important to know the functions of a living organisms or any of its parts.</li> <li>2)The main objective of this course was to understand how plant live and functions.</li> <li>3) To demonstrate knowledge and understanding as the molecular machinery of living cell.</li> <li>4) Studied basic principles and basic mechanisms of metabolic control and molecular signaling.</li> </ol>
	<b>2</b>	Paper II (Plant Ecology and Biodiversity) course code – BO.342	<ol style="list-style-type: none"> <li>1) Knowledge about the interaction between biotic and abiotic factor of environment.</li> <li>2)Adaptations of plant in different types of environmental conditions</li> <li>3)To understand the nature of environmental influences on individual organisms, their populations and communities on Ecoscapes</li> <li>4) The interrelationship between organisms in population and communities.</li> </ol>
	<b>3</b>	Paper II (Plant Pathology) course code – BO.343	<ol style="list-style-type: none"> <li>1)To studied the diseases or disorders caused by biotic and abiotic agent</li> <li>2) To studied mechanisms of diseases development by pathogens.</li> <li>3) Studied of interactions between plant and pathogen in relation to the overall environment.</li> </ol>

			4) Developed suitable management strategies for managing the diseases and losses caused by them.
	<b>4</b>	Paper IV (Medicinal and Economic Botany) course code – BO.344	1) It was important for pharmaceuticals. 2) It was important in Ayurveda. 3) In Economic to identify evaluated the economic important of medicinal plants. 4) Studied of relationship between people and plants.
	<b>5</b>	Paper V(Plant biotechnology ) course code – BO.345	1) To studied of application of science and technology to plants. 2) Improvement of varieties according to relevant agronomic features. 3) Natural diversity exploitation and biodiversity protection 4) Knowledge about bio factories.
	<b>6</b>	Paper VI ( Plant breeding and Seed Technology) course code – BO.346	1) The prime aim of plant breeding was to improve the characteristics of plant. 2) To improve the seed varieties, seed qualities etc. 3) To improved the plant varieties. 4) To studied the hybridization technique.
	T.Y.B.SC	Physical Chemistry Sem-I & II	1)studying this topic students are learned that. Expression for rate constant k for third order reaction ii. Examples of third order reaction iii. Characteristics of third order rate constant k iv. Derivation for half-life period of third order reaction and to show that half-life is inversely proportional to square of initial concentration of reactants. v. Experimental determination of order of reaction by Integrated rate equation method 2) studying this topic students are learned that i. Ohm’s law and electrical units such as coulomb, Ampere, Ohm and Volt. ii. Meaning of specific resistance, specific conductance, cell constant and their units. iii. Cell constant, its theoretical and experimental determination. iv. Preparation of conductivity water. v. Experimental determination of conductance. vi. Variation of specific and equivalent conductance of strong and weak electrolyte with dilution vii. Meaning of infinitely dilute solution. viii. Kohlrausch’s law of independent migration of ions and its applications such equivalent conductance of weak electrolyte at zero conc., degree of dissociation ( $\alpha$ ), ionic product of water. 3) ) studying this topic students are learned that i. Meaning and Types of equilibrium such as true or static, metastable and Unstable equilibrium. ii. Meaning of phase, component and degree of freedom. iii. Derivation of phase rule. iv. Explanation of water system : Description of the curve, Phase rule relationship and typical features. v. Explanation of sulphur system : Description of the curve, Phase rule relationship and typical features. vi. Explanation of two component system curve : for silver-lead and Zinc-cadmium. 4) studying this topic students are learned that i. What is

			<p>mean by Electrochemical cell with specific example ii. Origin of EMF of electrochemical cell. iii. Conventions used to represent electrochemical cell. iv. Thermodynamic conditions of reversible cell v. Explanations of reversible and irreversible electrochemical cell with suitable example. vi. What is mean by reference electrode? vii. Primary and secondary reference electrode viii. Construction, representation, working and limitation of Standard hydrogen Electrode ix. Construction, representation and working of Calomel and Silver –Silver Chloride electrode x. Types of electrodes xi. Conditions of Standard Cell xii. Construction, representation and working of Weston Standard Cell. xiii. Measurement of EMF of electrochemical cell xiv. Nernst Equation for theoretical determination of EMF. xv. Thermodynamics and EMF: Relation of EMF with <math>\Delta G</math>, <math>\Delta G^\circ</math>, <math>\Delta H</math>, <math>\Delta S</math> and equilibrium constant K of the cell reaction. xvi. Explanation of the term liquid junction potential</p> <p>5) studying this topic students are learned that i. Distinguish between crystalline and amorphous solids / anisotropic and isotropic solid ii. Explain the term crystallography and laws of crystallography iii. Weiss and Millers Indices iv. Crystal system and their characteristics v. Explain the term polymorphism /allotrophism vi. Distance between the planes for 100, 110 and 111 type of simple, body centred and face centred cubic crystals vii. Bragg's experiment and Derivation of <math>(n\lambda = 2d\sin\theta)</math> Bragg's equation viii. Explanation: Structure of NaCl can be ascertained with the help of X-ray analysis. ix. Laue's and Bragg's method.</p>
	T.Y.B.Sc -(sem I)	Industrial Chemistry	<p>i. Importance of chemical industry, ii. Meaning of the terms involved, iii. Comparison between batch and continuous process, iv. Knowledge of various industrial aspects2) ii. Nutritive aspects of food constituents, iii. Quality factors and their measurements, iv. Food deterioration factors and their control;</p>
	T.Y.B.Sc -(sem- II)		<p>Students should know i. Basics of polymer, ii. ii. Nomenclature, iii. Degree of polymerization, iv. Classification of polymerization reactions,2 The students are expected to learn i. Importance of sugar industry,3) Students should know about i. Different types of soap products, ii. Chemistry of soap.</p>