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DEPARTMENT OF MATHEMATICS

S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. I Semester	Differential Equation	1.Recognize and classify Differential Equations 2.Solve linear Ist Order Differential Equations 3.Solve constant coefficient linear second order Differential Equations 4.Identify research Problems where Differential Equations Can be eyed to model them	1. Solve linear differential Equations. 2. Convert non Exact homogeneous Equations to Exact differential Equations by using integrating factor 3. know the method of finding Solution of Differential Equations of Ist order but not of the Is degre 4. Solve higher order Linear differential Equation, both homo-geneous and non homogeneous, with Constant coefficients 5. understand the concept and Apply appropriate Imethods for solving Differential Equations.	

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DEPARTMENT OF MATHEMATICS

S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. II Semester	Three Dimensional Analytical Solid Geometry	1. To get awareness about the three dimensional geometry along with Visualisation 2. To able to apply 3-d geometry for The construction. 3. Acquire practical Knowledge about plane, straight line, spheres, cone, cylinder in three dimensional 4. Develop the skill of problem solving related to plane. straight line, sphere Cone, cylinder.	1. Get the knowledge of planes 2. Basic idea of lines, sphere and Cones 3. Understand the Properties of planes, lines, sphere and cone 4. Express the probleme geometrically and then to get the solutions	

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DEPARTMENT OF MATHEMATICS

S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. III Semester	Abstract Algebra	1. Present the relationships between abstract algebraic structures with familiar number Systems such as the integers and real numbers 2. Present Concepts of and the relationships between operations satisfying various Properties 3. Present concepts and Properties of various algebraic structure 4. Discuss the importance of algebraic property relative to working with in various number system.	1. Acquire the basic knowledge and structure of groups, Subgroups and cyclic groups. 2. Get the Significance of the notation of a normal subgroup 3. Get the behavior of Permutations and operations on them. 4. Study the homomorphisms and Isomomorphisms with Applications. 5. Understand the ring theory Concepts with the help of knowledge in group theory and prove theorems 6. Understand the applications of ring theory in various fields	

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S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. IV Semester	Real Analysis	1.Define the real numbes least upper bounds, and the triangle inequality 2. Define functions between sets, Equivalent sets, finite, countable and uncountable sets. 3. Recognize convergent, divergent, bounded Cauchy and montone Sequences 4. Calculate the limit Superior, limit inferior, and the limit of a sequence 5. Recognize alternating, Convergent, Conditionally and absolutely convergent series." 6. Determine if a function on a metric Space is discontinuous, Continuous, uniformly continues,	1. Get clear idea about the real numbers and real valued functions. 2. Obtain the skills of analyzing the concepte and applying appropriate methods for testing convergence of sequence/ Series 3. Test the continuity and differentiability and Riemann integration of a function. 4. Know the geometrical Interpretation of mean value theorem.	

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S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. V Semester	Linear Algebra	1. Solve Systems of linear Equation	1. Understand Concept of vector spaces, Sub spaces, basis, dimension and their properties	
			2. Recognize the Concept of the terms span, linear independence, basis and dimension, and apply these concepts to various vector spaces and subspaces	2. Understand the concepte of linear. transformations and their properties	
			3. Use matrix algebra and the related matrices to linear transformation	3. Apply Cayley Hamilton theorem to problems for finding the inverse of a matrix and higher Power of matreces without using routine methods.	
			4. Compute and use determinants	4. Learn the properties of inner product Spaces and determine orthogonality in inner product spaces.	
			5. Compute and use Eigen vectors and Eigen values		
			6. Determine and use orthogonality.		

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DEPARTMENT OF MATHEMATICS

S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. V Semester	Vector Calculus	1. Define vector field 2. Calculate line Integral along piece wise smooth paths interpret such quantities as work done by a force. 3. Use Green's theorem to Evaluate line integrals along simple closed contours on the plane. 4. Compute the curl and the divergence of vector fields. 5. Apply stokes theorem to compute line integrals along the boundary of a Surface. 6. Use the divergence theorem to give a physical interpretation of the divergence of a vector field,	1.Memorize definition of directional dérivative and gradient and illustrate geometric meanings with the aid of sketches. 2. Memorize theorem relating directional derivative to gradient and reproduce proof. 3. Calculate directional derivatives and gradients 4. Apply gradient to solve problems involving normal vectors to level Surfaces. 5. Explain the concept of a vector integration a plane and in space.	

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S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. VI Semester	Numerical Analysis	1.The course will also develop an understanding of the Elements of error analysis for Numerial methods and 2. The main objective of this course in to provide students with an introduction to the field of Numerical Analysis. 3. Derive appropriate Numerical methods. to solve probability based problem. 4. Derive appropriate Numerical methods to solve interpolation based problems 5. prove results fr Various numerical root finding methods	1. understanding theoritical and practical aspects of the use of numerical analysis. the 2. Establish the limitations, advantage, and disadvantage of numerical analysis. 3. derive numerica methods for various mathematical operation and tasks, such as interpolation, different iation, Integration, the solution of linear and non linear equating and the Solutions of D.E.	

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S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. VI Semester	Integral Transforms	The aim is to develop the knowledge of different transforms and its application	1. Have understanding regarding different kind of Integral, Transforms 2. Understand Fourier transform and its properties and will be able to solve the Examples based on it. 3. Have deep understanding of Laplece Transforms and its real life application 4. Solve initial value Problem And boundry value Problem Using Laplece transform 5. Derive Fourier series representation of Periodic problems	

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DEPARTMENT OF MATHEMATICS

S.No.	Name of the Programme	Name of the Course	Course Objectives	Course Outcomes	Remarks
1	B.Sc. VI Semester	Advance Numerical Methods	1.The course will also develop an understanding of the Elements of error analysis for Numerial methods and 2. The main objective of this course in to provide students with an introduction to the field of Numerical Analysis. 3. Derive appropriate Numerical methods. to solve probability based problem. 4. Derive appropriate Numerical methods to solve interpolation based problems 5. prove results fr Various numerical root finding methods	1. understanding theoritical and practical aspects of the use of numerical analysis. the 2. Establish the limitations, advantage, and disadvantage of numerical analysis. 3. derive numerica methods for various mathematical operation and tasks, such as interpolation, different iation, Integration, the solution of linear and non linear equating and the Solutions of D.E.	

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A.M.A.L. COLLEGE, ANAKAPALLE

B.Sc. PHYSICS SYLLABUS UNDER CBCS For Mathematics Combinations

[2015-16Batch onwards]

I Year B.Sc.-Physics: I Semester

Course I: MECHANICS AND PROPERTIES OF MATTER

Work load:60 hrs per semester **4 hrs/week**

- Course outcomes:

On successful completion of this course, the students will be able to:

- *Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section.*
- *Apply the rotational kinematic relations, the principle and working of gyroscope and it applications and the precessional motion of a freely rotating symmetric top.*
- *Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.*
- *Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.*

Practical Course 1: MECHANICS AND PROPERTIES OF MATTER, Work load: 30 hrs per semester 2 hrs/week

Course outcomes (Practicals):

On successful completion of this practical course, the student will be able to;

- Perform experiments on Properties of matter such as the determination of moduli of elasticity *viz.*, Young's modulus, Rigidity modulus of certain materials; Surface tension of water , Coefficient of viscosity of a liquid , Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values.

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B.Sc. PHYSICS SYLLABUS UNDER CBCS For Mathematics Combinations

[2015-16Batch onwards]

I Year B.Sc.-Physics: II Semester

WAVES AND OSCILLATIONS

- *Examinephenomena of simple harmonic motion and the distinction between undamped,damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.*
- *Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.*
- *Figure out the formation of harmonics and overtones in a stretched string and acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields.*

Practical Course 2: Waves and Oscillations, Work load: 30 hrs per semester 2 hrs/week

Course outcomes (Practicals):

- Know how to determine the acceleration due to gravity at a place using Compound pendulum and Simple pendulum.
- Notice the difference between flat resonance and sharp resonance in case of volume resonator and sonometer experiments respectively.
- Verify the laws of transverse vibrations in a stretched string using sonometer and comment on the relation between frequency, length and tension of a stretched string under vibration.
- Demonstrate the formation of stationary waves on a string in Melde's string experiment.
- Observe the motion of coupled oscillators and normal modes.

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B.Sc. PHYSICS SYLLABUS UNDER CBCS For Mathematics Combinations

[2015-16 Batch onwards]

II Year B.Sc.-Physics: III Semester Course-III: WAVE OPTICS

Work load:60 hrs per semester **4 hrs/week**

Course outcomes:

On successful completion of this course, the student will be able to:

- *Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude.*
- *Distinguish between Fresnel's diffraction and Fraunhoffer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.*
- *Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.*
- *Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity..*
- *Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.*
- *Explain about the different aberrations in lenses and discuss the methods of minimizing them.*
- *Understand the basic principles of fibreoptic communication and explore the field of Holography and Nonlinear optics and their applications.*

Practical Course III: Wave Optics

Work load: 30hrs Course outcomes (Practicals): *On successful completion of this practical course the student will be able to,* **2 hrs/week**

1. Gain hands-on experience of using various optical instruments like spectrometer, polarimeter and making finer measurements of wavelength of light using Newton Rings experiment, diffraction grating etc.

2. Understand the principle of working of polarimeter and the measurement of specific rotatory power of sugar solution

3. Know the techniques involved in measuring the resolving power of telescope and dispersive power of the material of the prism.

4. Be familiar with the determination of refractive index of liquid by Boy's method andthe determination of thickness of a thin wire by wedge method.

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B.Sc. PHYSICS SYLLABUS UNDER CBCS For Mathematics Combinations
[2015-16Batch onwards]
II Year B.Sc.-Physics: IV Semester Course-IV: HEAT AND THERMODYNAMICS
Work load: 60hrs per semester 4 hrs/week

Course outcomes:

On successful completion of this course, the student will be able to:

- *Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions and the transport phenomenon in ideal gases*
- *Gain knowledge on the basic concepts of thermodynamics, the first and the second law of thermodynamics, the basic principles of refrigeration, the concept of entropy ,the thermodynamic potentials and their physical interpretations.*
- *Understand the working of Carnot's ideal heat engine, Carnot cycle and its efficiency*
- *Develop critical understanding of concept of Thermodynamic potentials, theformulation of Maxwell's equations and its applications.*
- *Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures.*
- *Examine the nature of black body radiations and the basic theories.*

Practical Course-IV: Heat and Thermodynamics Work load: 30 hrs 2 hrs/week

On successful completion of this practical course, the student will be able to;

- *Perform some basic experiments in thermal Physics, viz., determinations of Stefan's constant, coefficient of thermal conductivity, variation of thermo-emf of athermocouple with temperature difference at its two junctions, calibration of a thermocouple and Specific heat of a liquid.*

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B.Sc. PHYSICS SYLLABUS UNDER CBCS For Mathematics Combinations

[2015-16Batch onwards]

III Year B.Sc.-Physics: V Semester

Course-V: ELECTRICITY, MAGNETISM AND ELECTRONICS

Work load:60 hrs per semester **4 hrs/week**

Course outcomes:

On successful completion of this course, the students will be able to:

- *Understand the Gauss law and its application to obtain electric field in different cases and formulate the relationship between electric displacement vector, electric polarization, Susceptibility, Permittivity and Dielectric constant.*
- *Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.*
- *Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.*
- *Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.*
- *Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q- factor, Power factor and the comparative study of series and parallel resonant circuits.*
- *Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors*
- *Understand the operation of basic logic gates and universal gates and their truth tables.*

Practical Course V: Electricity, Magnetism and Electronics

Work load: 30 hrs **2 hrs/week**

Course outcomes (Practicals):

On successful completion of this practical course the student will be able to;

- *Measure the current sensitivity and figure of merit of a moving coil galvanometer.*
- *Observe the resonance condition in LCR series and parallel circuit*
- *Learn how a sonometer can be used to determine the frequency of AC-supply.*
- *Observe the variation of magnetic field along the axis of a circular coil carrying current using Stewart and Gee's apparatus.*
- *Understand the operation of PN junction diode, Zener diode and a transistor and their V-I characteristics.*
- *Construct the basic logic gates, half adder and full adder and verify their truth tables. Further, the student will understand how NAND and NOR gates can be used as universal building blocks.*

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B.Sc. PHYSICS SYLLABUS UNDER CBCS For Mathematics Combinations

[2015-16Batch onwards]

III Year B.Sc.-Physics: V Semester Course V: MODERN PHYSICS

Work load:60hrs per semester **4 hrs/week**

Course outcomes:

On successful completion of this course, the students will be able to:

- *Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics.*
- *Develop critical understanding of concept of Matter waves and Uncertainty principle.*
- *Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.*
- *Examine the basic properties of nuclei, characteristics of Nuclear forces, salient features of Nuclear models and different nuclear radiation detectors.*
- *Classify Elementary particles based on their mass, charge, spin, half life and interaction.*
- *Get familiarized with the nano materials, their unique properties and applications.*
- *Increase the awareness and appreciation of superconductors and their practical applications.*

Practical Course V:Modern Physics

Work load: 30 hrs **2 hrs/week**

On successful completion of this practical course, the student will be able to;

- *Measure charge of an electron ande/m value of an electron by Thomson method.*
- *Understand how the Planck's constant can be determined using Photocell and LEDs.*
- *Study the absorption of α-rays and β-rays, Range of β-particles and the characteristics of GM counter*
- *Determine the Energy gap of a semiconductor using thermistor and junction diode.*

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B.Sc. PHYSICS SYLLABUS UNDER CBCS For Mathematics Combinations

[2015-16Batch onwards]

III Year B.Sc.-Physics: VI Semester Course VI: Renewable Energy

Work load:60 hrs per semester **4 hrs/week**

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Learning Outcomes: After successful completion of the course, the student will be able to:

1. Understand Sun structure, forms of energy coming from the Sun and its measurement.
2. Acquire a critical knowledge on the working of thermal and photovoltaic collectors.
3. Demonstrate skills related to callus culture through hands on experience
4. Understand testing procedures and fault analysis of thermal collectors and PV modules.
5. Comprehend applications of thermal collectors and PV modules.

Course 6: Renewable Energy – Practical (lab) work *(30 hrs, Max Marks:50)*

Learning Outcomes : On successful completion of this practical course, student shall be able to:

1. List out and identify various components of solar thermal collectors and systems, solar photovoltaic modules and systems.
2. Learn the procedures for measurement of direct, global and diffuse solar radiation, I - V characteristics and efficiency analysis of solar cells and modules.
3. Demonstrate skills acquired in evaluating the performance of solar cell / module in connecting them appropriately to get required power output.
4. Acquire skills in identification and elimination of the damaged panels without affecting the output power in a module / array.
5. Perform procedures and techniques related to general maintenance of solar thermal and photovoltaic modules.

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Department of Chemistry
Course Outcomes - 2018 - 2019

Programme Name	Course Name	Course Outcomes
I B.Sc. Sem - I	**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	Course I:After completion of these courses students should be able to; CO1. Write down the synthesis and properties of Diborane, silicones, hydrazine and hydroxylamine. CO2. Demonstrate knowledge gained in the preparation, classification and properties of organometallic compounds. CO3. Describe different types of organic reagents, inductive effect and its applicationsCO4. Describe the classification of organic reactions. CO5. Write down the methods of synthesis and properties of alkenesCO6. Write down the methods of synthesis and properties of alkynes CO7. Describe the concepts of resonance, aromaticity, general mechanism of electrophilic substitution reaction, ring activating and deactivating groups. CO8. Carry out the analysis of simple salt containing one anion and cation.
Sem - II	**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	**Course-2** After completion of these courses students should be able to; CO1. Describe the knowledge gained in the key concepts of solid state chemistry. CO2. Write down the critical phenomena and relationship between critical constants and vanwaals constants. CO3. Understand differences between liquid crystal and solid/liquid, classification of Liquidcrystals and applications of Liquid crystals. CO4. Write down the Henry's law, Raoult's law, Azeotropes, Nernst distribution law and its applications. CO5. Understand the definition, preparation, properties and applications of colloidsCO6. Describe the concepts of adsorption, types and theories of adsorption. CO6. Describe the concepts of Valence bond theory, hybridization and Molecular orbitaltheory. CO7. Gain knowledge about the key aspects in stereochemistry CO8. Carry out the analysis of mixture salt containing two anions and two cations.

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II B.Sc. Sem - III	***Chemistry Paper III : (INORGANIC & ORGANIC CHEMISTRY)*** 1. Chemistry of d-block elements 2. Theories of bonding in metals 3. Metal carbonyls 4. Chemistry of f-block elements 5. Halogen compounds 6. Hydroxy compounds 7. Carbonyl compounds 8. Carboxylic acids and derivatives 9. Active methylene compounds	**Course-3** After completion of these courses students should be able to; CO1. Describe the characteristics of d-block elements, magnetic properties and catalyticproperties of d-block elements and their ability to form complexes. CO2. Write down the theories of bonding in metals. CO3. Understand EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls. CO4. Describe the electronic structure and oxidation states of Lanthanides, lanthanide contraction, electronic structure and oxidation states of actinides. CO5. Understand Nomenclature and classification of alkyl (into primary, secondary, tertiary),aryl, aryl alkyl, allyl, vinyl, benzyl halides and Nucleophilic aliphatic substitution reactions. CO6. Describe the knowledge gained on nomenclature and classification of hydroxy compounds, Physical properties, Chemical properties and identification of alcohols. CO7. Write down the Nucleophilic addition reactions, oxidations and analysis of aldehydesand ketones. CO8. Describe the nomenclature, classification, physical properties and chemical propertiesof Carboxylic acids. CO9. Carry out the analysis of Fe (II) and Cu (II) using titrimetry and reactions of the functional groups present in organic compounds.

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Sem - IV	**SPECTROSCOPY & PHYSICAL CHEMISTRY** **SPECTROSCOPY** UNIT-I : Spctrophotometry and electronic spectroscopy Unit-II: Infra red spectroscopy Unit-III: Proton magnetic resonance spectroscopy (^{1}H-NMR) **PHYSICAL CHEMISTRY** **Unit-I: Dilute solutions** **Unit-II: Electrochemistry-I** **Unit-III: Electrochemistry-II** **Unit-IV: Phase rule**	**Course-4** After completion of these courses students should be able to; CO1. Describe the Beer-Lambert's law and its limitations and applications.CO2. Understand the basic concepts of electronic spectroscopy. CO3. Write down the basic concepts of Infrared spectroscopy and NMR spectroscopy. CO4. Understand the basic concepts and importance of colligative properties and abnormalColligative properties. CO5. Differentiate between specific conductance and equivalent conductance CO6. Understand the concepts of Kohlrausch's law, Debye-Huckel-Onsagar's equation forstrong electrolytes, transport number and its determination and conductometric titrations. CO7. Write down about single electrode potential, Reversible and irreversible cells, NernstEquation, determination of EMF of cell and Potentiometric titrations. CO8. Describe the basic concepts in Phase rule and its application to different systems. CO9. Carry out the Conductometric titrations and determine the Critical solution temperature(CST) of Water-Phenol system.
III B.Sc, Sem - V	***Chemistry Paper V : (INORGANIC, ORGANIC & PHYSICAL CHEMISTRY)*** **10. Coordination Chemistry** **11. Spectral and magnetic properties of metal complexes** **12. Stability of metal complexes** **13. Nitro hydrocarbons** **14. Nitrogen compounds** **Thermodynamics**	**Course-5** After completion of these courses students should be able to; CO1. Describe bonding theories, IUPAC nomenclature and Isomerism of coordinationcompounds. CO2. Write down the stability, magnetic properties and methods to determine thecomposition of complex compounds. CO3. Describe the nomenclature, preparation and reactivity of complex compounds.CO4. Gain knowledge about the nomenclature, preparation reactions of amines. CO5. Understand the laws of thermodynamics, concepts of entropy, enthalpy and internalenergy, Kirchoff's equation and carnot cycle. C06. Carry out the Analysis of an organic compound through systematic qualitativeprocedure.

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Sem - V	***Chemistry Paper VI : ((INORGANIC, ORGANIC & PHYSICAL CHEMISTRY)*** 1. Reactivity of metal complexes 2. Bioinorganic Chemistry 3. Chemical kinetics 4. Photochemistry 5. Heterocyclic compounds 6. Carbohydrates 7. Amino acids and proteins	**Course-6** After completion of these courses students should be able to; CO1. Describe the concepts in Chemical kinetics and photochemistry. CO2. Write down the aromatic character and substitution reactions in Furan, Thiophene,Pyrrole and Pyridine. CO3. Write down the cyclic structure of Glucose and Fructose and interconversions in monosaccharides. CO4. Gain knowledge about the classification, preparation and properties of amino acids andstructure of proteins. CO5. Describe the Theories of Trans effect and its applications CO6. Determine the viscosity and surface tension of an organic liquid and analyse the resultsCO7. Determine the rate constant for acid catalysed ester hydrolysis reaction.
Sem - VI	**Elective Paper – VII-(A)- Analytical MethodsIn Chemistry** **UNIT-I-Quantitative analysis** **Unit-II- Treatment of analytical data** **Unit-III- Separation TechniquesIn Chemical Analysis-** **A) Solvent Extraction** **B) Ion Exchange** **Unit-IV- Chromatography Principle** **Unit-V- TLC, Column chromatography, HPLC**	**Course-7** After completion of these courses students should be able to; CO1. Describe the basic concepts of Chromatography and principles of Chromatography CO2. Write down the theory and applications of different chromatographic techniques. CO3. Gain knowledge about different types of solvent extraction and applications of solventextraction. CO3. Write down the principles and applications of ion exchange method.CO4. Describe different types of titrations with examples CO5. Write down the concepts of co-precipitation and post precipitation.CO6. Determine Zn and Mg using EDTA by complexometric titration.

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Sem - VI	**Title of the course –Polymer Chemistry - Paper VIII AI** **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	POLYMER CHEMISTRY CO-1:To learn about the history, classification and functionality of polymeric materials. CO-2: To know about the kinetics of polymerization, details on crystallization and morphology of crystalline polymers, determination of crystalline melting point of a crystalline material and the factors effecting crystalline melting point. CO-3:To understand the nature and structure of polymers, determination of molecular weight of polymers and thermodynamics of polymer solution. CO-4:To study the preparation, structure, properties and application of different types of addition and condensation polymers. CO-5: To know how to prepare polymers by using free radical polymerization, redox polymerization, interfacial polymerization, precipitation polymerization, addition polymerization and condensation polymerization process. CO-6: To learn experimentally how to characterize and analyze a polymeric compound or material.
Sem - VI	**Title of the course – Instrumental Methods Of AnalysisUNIT – I - Paper VIII A2** 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)	CO1: Explain the theoretical principles of UV and IR spectroscopy. CO2: Learn basic principles and instrumentation of UV, IR, fluorimeter, flame photometer. CO3: Learn basic principles involved in TLC, column chromatography and paper chromatography CO4: Understand the separation of compounds by chromatographic techniques. CO5: Explain Instrumentation, separation and identification of compounds by electrophoresis technique. CO6: Learn separation and identification of compounds by various chromatographic techniques. CO7: Explain theory and instrumentation of GC, HPLC, gel chromatography, ion exchange chromatography and affinity chromatography. CO8: Learn applications of various chromatographic techniques for organic, inorganic and natural products.

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Sem - VI	**Title of the course – Drugs & Dairy products analysis** **Unit I : Paper VIII A3** Analysis of Aspirin, Paracetamol,Chloroquine,Amoxycilin, Chloramphenicol,metronidazole,Penc i llin,Tetracycline,Cefalexin &Isoniazid **Unit II:** Analysis and preparations of Allegra, Zyrtec, Alprazolam, trazodone, lorazepem, 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 chlolesterol, Glucose, Enzymes, RBC &WBC.	1. Students are expected to acquire the knowledge of understanding preparation and properties of various drugs. 2. Students analyze the factor after learning this unit analysis of milk & dairy products. 3. Students able to predict factors & know about RBC, WBC, cholesterol, glucose, Enzymes etc.

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DEPARTMENT OF COMPUTER SCIENCE

2015-2016 onwards

I YEAR 1 SEMESTER

Paper-I Computer Fundamentals & Photoshop

Course Objectives:

Students will learn the basic tools used in Adobe Photoshop to create and edit images. Students will learn how to optimize images and save images in proper file formats.

Course Outcome:

1. To explore basic knowledge on computers and Photoshop's beauty from the practical to the painterly artistic and to understand.
1. How Photoshop will help you create your own successful images.
2. Understand the basic principles of graphic design using Photoshop including typography, colour, and composition...

I YEAR II SEMESTER

Paper-II : PROGRAMMING IN C

Course Objectives:

Learn how to solve common types of computing problems, To Learn data types and control structures of C. Learn to map problems to programming features of C, Learn to write good portable C programs.

Course Outcomes:

1. Appreciate and understand the working of a digital computer
2. Analyze a given problem and develop an algorithm to solve the problem
3. Improve upon a solution to a problem
4. Use the 'C' language constructs in the right way
5. Design, develop and test programs written in 'C'

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II YEAR III SEMESTER

Paper-III : OBJECT ORIENTED PROGRAMMING USING JAVA

Course Objectives:

As the business environment becomes more sophisticated, the software development (software engineering is about managing complexity) is becoming increasingly complex. As of the best programming paradigm which helps to eliminate complexity of large projects, Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

Course Outcomes:

1. Understand the concept and underlying principles of Object-Oriented Programming
2. Understand how object-oriented concepts are incorporated into the Java programming language
3. Develop problem-solving and programming skills using OOP concept
4. Understand the benefits of a well-structured program
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java
6. Develop efficient Java applets and applications using OOP concept
7. Become familiar with the fundamentals and acquire programming skills in the Java language.

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II YEAR IV SEMESTER

Paper-IV: DATA STRUCTURES

Course Objectives:

To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms.

Course Outcomes:

1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
4. Demonstrate different methods for traversing trees
5. Compare alternative implementations of data structures with respect to performance
6. Compare and contrast the benefits of dynamic and static data structures implementations
7. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack.
8. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

III YEAR V SEMESTER

Paper-V: Data Base Management System

Course Objective:

Design & develop database for large volumes & varieties of data with optimized data processing techniques.

Course Outcomes:

1. Design and model of data in database.
2. Store, Retrieve data in database.

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III YEAR V SEMESTER
Paper VI : Software Engineering

Course Objectives:

The Objective of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course outcomes:

1. Ability to gather and specify requirements of the software projects.
2. Ability to analyze software requirements with existing tools
3. Able to differentiate different testing methodologies
4. Able to understand and apply the basic project management practices in real life projects
5. Ability to work in a team as well as independently on software projects

III YEAR VI SEMESTER
Paper-VII : Elective-C
Web Technologies Lab

Course Objectives:

The objective of Web Technology To develop an ability to design and implement static and dynamic website. To comprehend the basics of the internet and web terminologies, introduce scripting language concepts for developing client-side applications. practice server-side programming features like PHP, JSP. it's familiar with database applications, To know the usefulness of web services.

Course outcomes:

1. Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
2. Have a Good grounding of Web Application Terminologies, Internet Tools, E – Commerce and other web services.
3. Get introduced in the area of Online Game programming.

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III YEAR VI SEMESTER

(Cluster C) Paper-VIII : Elective –C-1

Paper-VIII : PHP & MySql , Wordpress

Course Objectives:

To introduce the concept of PHP and to give basic Knowledge of PHP. Learn about PHP Syntax., Arrays, PHP Loops, PHP and MySQL connectivity, PHP form validation, PHP form handling. Overview of MySQL and PHPMyAdmin, Understand basic concepts of how a database stores information via tables, Understanding of SQL syntax used with MySQL, Learn how to retrieve and manipulate data from one or more tables, Know how to filter data based upon multiple conditions, Updating and inserting data into existing tables, Learning how the relationships between tables will affect the SQL, The advantages of store procedures with storing data using variables and functions, How SQL can be used with programming languages like PHP to create dynamic websites for visitors, Review of some sample PHP projects interacting with MySQL.

Course Outcomes:

1. Introduction to web development with PHP
2. How to code a PHP application
3. Introduction to relational databases and MySQL
4. How to use PHP with a MySQL database
5. How to use the MVC pattern to organize your code
6. How to test and debug a PHP application
7. How to work with form data
8. How to code control statements
9. How to work with strings and numbers
10. How to work with dates
11. How to create and use arrays
12. How to work with cookies and sessions
13. How to create and use functions
14. How to use regular expressions, handle exceptions, and validate data

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(Cluster C) Paper-VIII: Elective –C-2
Paper-VIII: Advanced Java Script
JQUERY /AJAX / JSON / Angular JS

Course Objective:

To improve knowledge in designing a webpage in a structured way by using advanced java script i.e using different scripting languages like JQUERY , AJAX, ANGULAR JS etc.....
Advanced java script is used in a wide range of applications. Right from basic Web designing to advanced robotics also.

Course Outcomes:

1. Create a dynamic website using advanced features of JavaScript.
2. Create a website with good and attractive design.
3. Now A Days Most Of The Application Used These Advanced JavaScript Concepts In
    a) Web Applications ·
    b) Web Development ·
    c) Mobile Applications ·
    d) Game ·
    e) Presentations ·
    f) Server Applications ·
    g) Web Servers etc……

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B.Com (Regular)

Program Outcome

- This program could provide Industries, Banking Sectors, Insurance Companies, Financing companies, Transport Agencies, Warehousing etc., well trained professionals to meet the requirements.

- After completing graduation, students can get skills regarding various aspects like Marketing Manager, Selling Manager, over all Administration abilities of the Company.

- Capability of the students to make decisions at personal & professional level will increase after completion of this course.

- Students can independently start up their own Business.

- Students can get thorough knowledge of finance and commerce.

- The knowledge of different specializations in Accounting, costing, banking and finance with the practical exposure helps the students to stand in organization.

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Program Specific Outcome

- The students can get the knowledge, skills and attitudes during the end of the B.com degree course.
- By goodness of the preparation they can turn into a Manager, Accountant , Management Accountant, cost Accountant, Bank Manager, Auditor, Company Secretary, Teacher, Professor, Stock Agents, Government employments and so on.,
- Students will prove themselves in different professional exams like C.A. , C S, CMA, MPSC, UPSC. As well as other coerces.
- The students will acquire the knowledge, skill in different areas of communication, decision making, innovations and problem solving in day to day business activities.
- Students will gain thorough systematic and subject skills within various disciplines of finance, auditing and taxation, accounting, management, communication, computer.
- Students can also get the practical skills to work as accountant, audit assistant, tax consultant, and computer operator. As well as other financial supporting services.
- Students will learn relevant Advanced accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business.
- Students will be able to do their higher education and can make research in the field of finance and commerce.

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Course Outcomes

Financial Accounting:

- To enable the students to learn principles and concepts of Accountancy.
- Students are enabled with the Knowledge in the practical applications of accounting.
- To enable the students to learn the basic concepts of Partnership Accounting, and allied aspects of accounting.
- The student will get thorough knowledge on the accounting practice prevailing in partnership firms and other allied aspects.
- To find out the technical expertise in maintaining the books of accounts.
- To encourage the students about maintaining the books of accounts for further reference.

Marketing and Salesmanship

- This course enables the students, the practical knowledge and the tactics in the marketing.
- To study and critically analyze the basic concepts and trends in Marketing.
- To aware of the recent changes in the field of marketing.

Business Environment and Entrepreneurship

- To make the students aware about the Business and Business Environment.
- To develop entrepreneurial awareness among students.
- To motivate students to make their mind set for thinking entrepreneurship as career.

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Banking and Finance

- To familiar the students with the fundamentals of banking and thorough knowledge of banking operations.
- To build up the capability of students for knowing banking concepts and operations.
- To make the students aware of banking business and practices.
- To make understandable to the students regarding the new concepts introduced in the banking system.

Compulsory English

- To offer relevant and practically helpful pieces of prose and poetry to students so that they not only get to know the beauty and communicative power of English but also its practical application.
- To expose students to a variety of topics that dominates the contemporary socio-economic and cultural life.
- To develop oral and written communication skills of the students so that their employability enhances.
- To develop overall linguistic competence and communicative skills of students

Functional English

- To expose students to a good blend of old and new literary extracts having various themes that are entertaining and informative so that they realize the beauty ad communicative power of English
- To make students aware of the cultural values and the major problems in the world today.
- To develop literary sensibilities and communicative abilities among

students.

Business Economics (Micro)

- To provide students knowledge of Micro Economic concepts and inculcate an analytical approach to the subject matter.
- To arouse the students interest by showing the relevance and use of various economic theories.
- To apply economic reasoning to solve business problems.

Organizational skill development

- To make familiar the students with the emerging changes in the modern office environment and to develop organizational skills.

To build up the conceptual , analytical , technical and managerial skills of students efficient office organization and records management

- Technical skills among the students for designing and developing effective means to manage records , consistency and efficiency of work flow in the administrative section of an organization will be developed.
- To develop employability skills among the students.

Business Communication

- To make the students aware about the business communication.
- To understand the process and importance of communication.
- To develop awareness regarding new trends in business communication, various media of communication and communication devices.
- To extend business communication skills through the application and exercises

Corporate Accounting

- This course aims to enlighten the students on the accounting procedures followed by the Companies.
- Student's skills about accounting standards will be developed.
- To make aware the students about the valuation of shares.

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- To impart knowledge about holding company accounts, amalgamation, absorption and reconstruction of company.

Business Economics (Macro)

- To familiarize the students with the basic concept of Macro Economics and its application.
- To aware students about Gross National Product (GNP), Net National Product (NNP) ,Income at Factor cost or National Income at Factor Prices ,Per Capita Income , Personal Income (PI) ,Disposable Income etc.
- To Study the relationship among broad aggregates.
- To apply economic reasoning to solve the problems of the economy.

Business management

- To understand the concept & functions and importance of management and its application.
- To make the student understand principles, functions and different management theories.

Elements of company law

- To impart students with the knowledge of fundamentals of Company Law and provisions of the Companies Act of 2013.
- To apprise the students of new concepts involving in company law regime.
- To acquaint the students with the duties and responsibilities of Key Managerial Personnel.

Indian Banking System – I

- To make the students aware of Indian banking system.

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- To enables students to understand the reforms and other developments in the Indian Banking.
- To impart knowledge about functions and role of Reserve Bank of India.

Cost and works accounting I

- To understand Basic Cost concepts, Elements of cost and cost sheet.
- Providing knowledge about difference between financial accounting and cost accounting.
- Ascertainment of Material and Labor Cost.
- Student's Capability to apply theoretical knowledge in practical situation will be increased.

A course in environmental studies

- To furnish awareness about environmental problems among people.
- Impart basic knowledge about the environment and its allied problems.
- Developing an attitude of concern for the environment.
- Acquiring skills to help the concerned individuals in identifying and solving environmental problems.

Advanced Accounting

- To provide the knowledge of various accounting concepts
- To impart the knowledge about accounting methods, procedures and techniques.
- To acquaint students with practical approach to accounts writing by using software package and by learning various accounts.

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Auditing and taxation

- Students will be versed in the fundamental concepts of Auditing and different aspects of tax.
- Students can understand Income Tax system properly, and can get the knowledge of different tax provisions.
- To give knowledge about preparation of Audit report, Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961.

Banking & Finance II (Financial Markets and Institutions in India)

- Enable the students with Financial Markets and its various segments.
- To give the students and understanding of the operations and developments in financial markets in India.
- To acquaint them to gain an insight into the functioning and role of financial institutions in the Indian Economy.

Cost and Works Accounting III

- To provide knowledge regarding costing techniques.
- To give training as regards concepts, procedures and legal Provisions of cost audit.

Banking & Finance III (Banking Law and Practices in India.)

- To enlighten the students' knowledge on Banking Regulation Acts.
- To give a thorough knowledge on Indian Banking System and Acts pertaining to it.
- To provide understanding of nature, importance, of banking sector.
- To know the structure of finance related areas.
- To impart knowledge regarding source of finance for a business.

A.M.A.L. COLLEGE Date..... ANAKAPALLE

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DEPARTMENT OF PHYSICS

Andhra Pradesh State Council of Higher Education

B.Sc. Electronics Syllabus under CBCS

w.e.f. 2015-16 (revised in April 2016)

SEMESTER-1 **PAPER – I**

BASIC CIRCUIT THEORY

Objectives:

To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis techniques. Analyze circuits in time and frequency domain. Synthesize the networks using passive elements.

Outcomes:-

1. Apply concepts of electric network topology, nodes, branches, loops to solve circuit problems including the use of computer simulation.
2. Apply time and frequency concepts of analysis.
3. Synthesize the network using passive elements.

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DEPARTMENT OF PHYSICS

B.Sc. Electronics Syllabus under CBCS
w.e.f. 2015-16 (revised in April 2016)

Semester-2 **PAPER – 2**

Electronic Devices and Circuits

Objectives:

Understand the construction, working and VI characteristics of electronic devices. Know about amplifier circuits, switching circuits and oscillator circuits their design and use in electronics. Design and construction of a power supply.

Outcomes:-

1. Know about amplifier circuits, switching circuits and oscillator circuits their design and use in electronics.
2. Design and construction of a power supply.

A.M.A.L. COLLEGE Date..... ANAKAPALLE

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B.Sc. Electronics Syllabus under CBCS
w.e.f. 2015-16 (revised in April 2016)

SEMESTER – III **PAPER – 3**

Digital Electronics

Objectives:

Understand the number systems, Binary codes and Complements.

Understand the Boolean algebra and simplification of Boolean expressions. Analyze logic processes and implement logical operations using combinational logic circuits. Understand the concepts of sequential circuits and to analyze sequential systems in terms of state machines.

Outcomes:-

1. Develop a digital logic and apply it to solve real life problems.
2. Analyze, design and implement combinational logic circuits.
3. Classify different semiconductor memories.
4. Analyze, design and implement sequential logic circuits.
5. Simulate and implement combinational and sequential logic circuits using VHDL.

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w.e.f. 2015-16 (revised in April 2016)

SEMESTER – IV **PAPER – 4**

Analog and Digital ic-applictions

OBJECTIVES:

To understand the concepts, working principles and key applications of linear integrated circuits. Perform analysis of circuits based on linear integrated circuits.

Design circuits and systems for particular applications using linear integrated circuits.

OUTCOMES:

Understand the fundamentals and areas of applications for the integrated circuits.

Analyze important types of integrated circuits.

Demonstrate the ability to design practical circuits that perform the desired operation.

Select the appropriate integrated circuit modules to build a given application.

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B.Sc. Electronics Syllabus under CBCS

w.e.f. 2015-16 (revised in April 2016)

3rd YEAR

Semester-V **Paper- V**

MICROPROCESSOR INTERFACING AND APPLICATION

OBJECTIVES:

To understand basic architecture of 16 bit and 32 bit microprocessors.

Understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design. Understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.

OUTCOMES:

- The student can gain good knowledge on microprocessor and implement in practical applications
- Design system using memory chips and peripheral chips for 16 bit 8086 Microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
- Understand multi core processor and its advantages

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B.Sc. Electronics Syllabus under CBCS

w.e.f. 2015-16 (revised in April 2016)

3rd YEAR

Semester-VI **Paper- VI**

MICRO-CONTROLLER INTERFACING AND APPLICATION

OBJECTIVES:

To understand basic architecture of 16 bit and 32 bit microprocessors. Understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design. Understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.

OUTCOMES:

- The student can gain good knowledge on microcontroller and implement in practical applications
- Design system using memory chips and peripheral chips for 16 bit 8051 Micro controller.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microcontrollers.
- Understand multi core controller and its advantages

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DEPARTMENT OF TELUGU
2015-2016 to 2018-2019
SEMESTER -I

COURSE OUTCOMES *CO – 1* ఆంధ్ర మహాభారతం గురించి విద్యార్థులకు అవగాహన కల్పించుట అన్నదమ్ముల మధ్య వివాదాలు ఉండకూడదు అని ప్రేమాప్యాయతలు ఉండాలని వివరణ.

CO -2 ద్రౌపదీపరిదేవనం ద్వారా పూర్వకాలం స్త్రీలకు లభించే గౌరవాన్ని వివరించడం తిక్కన కవిత్వం యొక్క విశిష్టతను వివరించడం.

CO-3 -గురజాడ రచించిన కన్యక పాఠ్యాంశం ద్వారా ఆనాటి స్త్రీల స్థితిగతులను విద్యార్థులకు అవగాహన చేయుట.

CO -4 శ్రీ శ్రీ వారి దేశ చరిత్రలు పాఠ్యాంశం దేశం పట్ల విద్యార్థులకు ఉండవలసిన బాధ్యతలు వివరణ.

CO -5 చింతల తోపు పాఠ్యాంశం ద్వారా విద్యార్థులకు పూర్వపు రైతుల స్థితిగతులు వివరణ.

CO -6 నారాయణస్వామి సావు కూడు పాఠ్యాంశం ద్వారా ఆనాటి రాయలసీమ స్థితిగతులు వివరణ.

CO -7 సంధులు ఏ విధంగా ఏర్పడతాయి వాక్యాలను ఏ విధంగా రాయాలి వివరణ.

CO -8 సమాసాలు పదాల కలయిక అందులోని రకాలు సమాచారం.

CO -9 అక్షర దోషాలు ద్వారా విద్యార్థులు తప్పులు రాయకుండా సరిదిద్దుట.

అభ్యసన లక్ష్యాలు:

1. నన్నయ తిక్కన ఎర్రన మొదలైన ప్రసిద్ధ కవుల పాఠ్యాంసేతర పద్యాలను ఇచ్చి విద్యార్థుల చేత సమీక్షలు రాయించడం ఆయా పద్యాలలోని యతి ప్రాసాది చందో విశేషాలను గుర్తింపచేయడం.
2. విద్యార్థుల చేత పాఠ్యాంశాలకు సంబంధించిన వ్యాసాలు రాయించడం సెమినార్, అసైన్మెంట్.
3. చారిత్రక సాంస్కృతిక అంశాలకు సంబంధించిన పర్యాటక ప్రదేశాలను సందర్శించడం.
4. వ్యక్తిగత బృంద ప్రాజెక్టులు చేయించడం.
5. ప్రాచీన పాఠ్యాంశాలలోని సమకాలీనతను గురించిన బృంద చర్చ.

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A.M.A.L.COLLEGE, ANAKAPALLE
DEPARTMENT OF TELUGU
2015-2016 to 2018-2019
SEMESTER -II

COURSE OUTCOMES CO -1: సాయుజ్యం ద్వారా శ్రీకాళహస్తి యొక్క పుణ్యక్షేత్రం మహిమను తెలియజేయడం.

CO -2 చేమకూర వెంకట కవి గారి సుభద్ర పరిణయం ద్వారా పూర్వపు వివాహ ఆచారాలు సాంప్రదాయాలు తెలియజేయడం.

CO -3 జాషువా గారి పిరదౌసి లేఖ ద్వారా ఆనాటి సుల్తానుల అహంకారాన్ని విద్యార్థులకు తెలియజేయుట.

CO -4 చెట్టు పాఠ్యాంశం ద్వారా చెట్టు యొక్క ప్రయోజనాలు, లాభాలు తెలియజేయడం.

CO -5 నమ్ముకున్న నేల పాఠ్యాంశం ద్వారా రైతుల యొక్క కష్టాల వివరణ.

CO -6 అమ్మకు ఆదివారం లేదా పాఠ్యాంశం ద్వారా అమ్మ యొక్క గొప్పతనం వివరణ.

CO -7 బతుకాట నవల ద్వారా విద్యార్థులలో జీవన ప్రమాణాన్ని పెంచడం.

అభ్యసన లక్ష్యాలు:

1. విద్యార్థుల చేత పాఠ్యాంశాలకు సంబంధించిన వ్యాసాలు రాయించడం సెమినార్, అసైన్మెంట్.
2. చారిత్రక సాంస్కృతిక అంశాలకు సంబంధించిన పర్యాటక ప్రదేశాలను సందర్శించడం.
3. వ్యక్తిగత బృంద ప్రాజెక్టులు చేయించడం.
4. ప్రాచీన పాఠ్యాంశాలలోని సమకాలీనతను గురించిన బృంద చర్చ.

A.M.A.L COLLEGE Date..... ANAKAPALLE

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A.M.A.L.COLLEGE, ANAKAPALLE
DEPARTMENT OF TELUGU
2015-2016 to 2018-2019
SEMESTER -III

COURSE OUTCOMES :

CO -1 ఆంధ్ర మహాభారతం గురించి విద్యార్థులకు అవగాహన కలిగించుట.

CO – 2 శాలివాహన విజయం ద్వారా విద్యార్థులకు ప్రాచీన కథల వివరణ.

CO -3 కుసుమ ధర్మన్న గారి హరిజన శతకం ద్వారా ఆనాటి హరిజనుల స్థితిగతుల వివరణ.

CO -4 సంక్రాంతి సంబరం పాఠ్యాంశం ద్వారా పండుగల యొక్క విశిష్టతను వివరించుట.

CO -5 ఆచార్య గుజ్జర్లమూడి కృపాచారి గారి తెలుగు భాష పాఠ్యాంశం ద్వారా భాష యొక్క విశిష్టతని తెలుపుట.

CO -6 వ్యక్తిత్వ వికాసం పాఠ్యాంశం ద్వారా విద్యార్థులు తమ వ్యక్తిత్వాన్ని ఏ విధంగా పెంపొందించుకోవాలో వారి నడవడికను ఏ విధంగా మార్చుకోవాలో వివరించుట.

CO -7 ఛందస్సు గణ విభజన పద్యాలు కూర్పు వివరణ.

CO -8 అలంకారాలు సాహిత్యానికి ఎంత ఉపయోగకరము వివరించుట.

CO -9 విద్యార్థులకు తెలుగు వారాలు తిథులు, నక్షత్రాలు, సంవత్సరాల పేర్లను వివరించుట.

అభ్యసన లక్ష్యాలు:

1. నన్నయ తిక్కన ఎర్రన మొదలైన ప్రసిద్ధ కవుల పాఠ్యాంసేతర పద్యాలను ఇచ్చి విద్యార్థుల చేత సమీక్షలు రాయించడం ఆయా పద్యాలలోని యతి ప్రాసాది చందో విశేషాలను గుర్తింపచేయడం
2. విద్యార్థుల చేత పాఠ్యాంశాలకు సంబంధించిన వ్యాసాలు రాయించడం సెమినార్, అసైన్మెంట్.
3. చారిత్రక సాంస్కృతిక అంశాలకు సంబంధించిన పర్యాటక ప్రదేశాలను సందర్శించడం.
4. వ్యక్తిగత బృంద ప్రాజెక్టులు చేయించడం.
5. ప్రాచీన పాఠ్యాంశాలలోని సమకాలీనతను గురించిన బృంద చర్చ.

A.M.A.L COLLEGE Date..... ANAKAPALLE

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English Syllabus-Semester-I

English Praxis Course-I

A Course in Communication and Soft Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Use grammar effectively in writing and speaking.
- Demonstrate the use of good vocabulary
- Demonstrate an understating of writing skills
- Acquire ability to use Soft Skills in professional and daily life.
- Confidently use the tools of communication skills

English Syllabus-Semester-II

English Praxis Course-II

A Course in Reading & Writing Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Use reading skills effectively
- Comprehend different texts
- Interpret different types of texts
- Analyse what is being read
- Build up a repository of active vocabulary
- Use good writing strategies
- Write well for any purpose
- Improve writing skills independently for future needs

English Syllabus-Semester-III

English Praxis Course-III

A Course in Conversational Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Speak fluently in English
- Participate confidently in any social interaction
- Face any professional discourse
- Demonstrate critical thinking
- Enhance conversational skills by observing the professional interviews

A.M.A.L. COLLEGE Date..... PRINCIPAL A.M.A.L.COLLEGE ANAKAPALLE

English Syllabus-Semester-I

English Praxis Course-I

A Course in Communication and Soft Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Use grammar effectively in writing and speaking.
- Demonstrate the use of good vocabulary
- Demonstrate an understating of writing skills
- Acquire ability to use Soft Skills in professional and daily life.
- Confidently use the tools of communication skills

I. UNIT: Listening Skills

i. Importance of Listening
ii. Types of Listening
iii. Barriers to Listening
iv. Effective Listening

II. UNIT: Speaking Skills

a. Sounds of English: Vowels and Consonants
b. Word Accent
c. Intonation

III. UNIT: Grammar

a) Concord
b) Modals
c) Tenses (Present/Past/Future)
d) Articles
e) Prepositions
f) Question Tags
g) Sentence Transformation (Voice, Reported Speech & Degrees of Comparison)
h) Error Correction

IV. UNIT: Writing

i. Punctuation
ii. Spelling
iii. Paragraph Writing

V. UNIT: Soft Skills

a. SWOC
b. Attitude
c. Emotional Intelligence
d. Telephone Etiquette
e. Interpersonal Skills

A.M.A.L. COLLEGE Date..... P.E.

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English Syllabus-Semester-II

English Praxis Course-II

A Course in Reading & Writing Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Use reading skills effectively
- Comprehend different texts
- Interpret different types of texts
- Analyse what is being read
- Build up a repository of active vocabulary
- Use good writing strategies
- Write well for any purpose
- Improve writing skills independently for future needs

I. UNIT

Prose	: 1. How to Avoid Foolish Opinions	Bertrand Russell
Skills	: 2. Vocabulary: Conversion of Words	
	: 3. One Word Substitutes	
	: 4. Collocations	

II. UNIT

Prose	: 1. The Doll's House	Katherine Mansfield
Poetry	: 2. Ode to the West Wind	P B Shelley
Non-Detailed Text	: 3. Florence Nightingale	Abrar Mohsin
Skills	: 4. Skimming and Scanning	

III. UNIT

Prose	: 1. The Night Train at Deoli	Ruskin Bond
Poetry	: 2. Upagupta	Rabindranath Tagore
Skills	: 3. Reading Comprehension	
	: 4. Note Making/Taking	

IV. UNIT

Poetry	: 1. Coromandel Fishers	Sarojini Naidu
Skills	: 2. Expansion of Ideas	
	: 3. Notices, Agendas and Minutes	

V.UNIT

Non-Detailed Text	: 1. An Astrologer's Day	R K Narayan
Skills	: 2. Curriculum Vitae and Resume	
	: 3. Letters	
	: 4. E-Correspondence	

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English Syllabus-Semester-III

English Praxis Course-III

A Course in Conversational Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Speak fluently in English
- Participate confidently in any social interaction
- Face any professional discourse
- Demonstrate critical thinking
- Enhance conversational skills by observing the professional interviews

I. UNIT

Speech : 1. Tryst with Destiny — Jawaharlal Nehru
Skills : 2. Greetings
: 3. Introductions

II. UNIT

Speech : 1. Yes, We Can — Barack Obama
Interview : 2. A Leader Should Know How to Manage Failure
Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton
Skills : 3. Requests

III. UNIT

Interview : 1. Nelson Mandela's Interview — With Larry King
Skills : 2. Asking and Giving Information
: 3. Agreeing and Disagreeing

IV. UNIT

Interview : 1. JRD Tata's Interview — With T.N.Ninan
Skills : 2. Dialogue Building
: 3. Giving Instructions/Directions

V. UNIT

1. **Speech** : 1. You've Got to Find What You Love — Steve Jobs
Skills : 2. Debates
: 3. Descriptions
: 4. Role Play

A.M.A.L. COLLEGE Date..... ANAKAPALLE

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A.M.A.L.COLLEGE, ANAKAPALLE

DEPARTMENT OF P.G. CHEMISTRY

2018 – 2019

M.Sc. (Previous) semester – I

Paper I- GENERAL CHEMISTRY

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Understand the wave function properties; Operators & Postulates of Quantum Mechanics.

CO 2: Learn & understand the selection rules for a particle in various dimensional boxes.

CO 3: Learn & understand the selection rules & criteria for molecules to exhibit rotational & IR Spectroscopy.

CO 4: Understand the classical & Quantum mechanical theories of Raman Spectroscopy & basic concepts of Electronic Spectroscopy.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To apply the operations to various problems in Quantum chemistry.

LO 2: To predict the selection rules for a particle present in various dimensional boxes.

LO 3: To apply the Spectroscopic methods for structure elucidation of molecules.

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Paper II- INORGANIC CHEMISTRY

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Acquire the knowledge on applications of VSEPR, Valence bond & Molecular orbital theories in explaining the structures of simple molecules & role of p & d orbitals in Pi-bonding.

CO 2: Understand the concept of MO Theory to square planar

($PtCl_4^{2-}$) & octahedral complexes (CoF_6^{3-}, $[CO(NH_3)_6^{3+}]$).

CO 3: Understand about cage & ring compounds of inorganic elements like B, N, P & S.

CO 4: Understand the splitting of d-orbitals in various geometries & factors which influence the splitting of d- orbitals.

CO 5: Understand the concept of Term symbols, electronic spectra & rules of complexes.

CO 6: Understand the Orgel & Tanabe-Sugano diagrams for d^1- d^9octahedral & tetrahedral transition metal complexes.

CO 7: Develop interest in the areas of magnetic properties of transition & inner transition metal complexes.

Learning Outcomes (Los):

Up on completion of the course the student will be able to

LO 1: Explain idea of structure & bonding theories of Inorganic compounds.

LO 2: Introduce electron counting rules for higher boranes.

LO 3: Analyze the preparation, structure & bonding in inorganic ring & cage like compounds.

LO 4: Understanding structure & bonding in coordination compounds.

LO 5: Explain selection rules, Tanabe-Sugano & Orgel diagrams.

LO 6: To calculate magnetic moment of metal complexes.

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Paper III- ORGANIC CHEMISTRY

Course Objectives (Cos): To make the students

CO 1: Acquire the knowledge of structure & reactivity, Aromaticity, types of Organic reactions, Reagents, Reactive Intermediates, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural products.

CO 2: Understand the structure & reactivity, Aromaticity, types of Organic reactions, Reagents, Reactive Intermediates, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural products.

CO 3: Apply the knowledge & understanding of structure & reactivity, Aromaticity, types of Organic reactions, Reagents, Reactive Intermediates, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural products to new situations.

CO 4: Develop interest in the areas of structure & reactivity, Aromaticity, types of Organic reactions, Reagents, Reactive Intermediates, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural products.

Learning outcomes: At the end of the course, the learners should be able to:

LO 1: Explain & interpret the structure & Reactivity, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural Products.

LO 2: Compare & analyze the structure & Reactivity, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural Products.

LO 3: Solve & identify the structure & Reactivity, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural Products.

LO 4: Apply structure & Reactivity, Stereochemistry & conformational analysis, Chemistry of Heterocyclic compounds & Chemistry of Natural Products.

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Paper IV - PHYSICAL CHEMISTRY

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Explain the concepts of Thermodynamics & its applications.

CO 2: Understand the principle of Micellization, types of Polymers & analyze various physical properties of polymers.

CO 3: Understand various kinetic theories, measurement of Reaction rates, learn experimental techniques for measuring the kinetics of fast reactions.

CO 4: Learn principles of Photochemistry & various photochemical reactions.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To apply the concepts of Thermodynamics to various problems in chemistry.

LO 2: To apply the concept of Micellization to various chemical reactions & analyze the kinetics of different polymerization process.

LO 3: To predict various reaction mechanisms.

LO 4: To predict the mechanism of photochemical reactions.

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A.M.A.L.COLLEGE, ANAKAPALLE

DEPARTMENT OF P.G. CHEMISTRY

2018 – 2019

M.Sc. (Previous) semester – II

Paper I- GENERAL CHEMISTRY

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Understand the solution of Hydrogen atom; Approximation methods.

CO 2: Learn MO Theory – LCAO approximation.

CO 3: Learn basics of Group theory & its applications in chemistry.

CO 4: Learn Anatomy of Character table & its applications in chemistry.

CO 5: Understand the basic concept of FORTRAN programming & its applications.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To calculate the ground state energy of Helium & Hydrogen atoms by using approximation methods.

LO 2: To calculate the Ionic & Covalent bond contributions in Hydrogen molecule.

LO 3: To predict the bond order, magnetic nature of Homo Nuclear & Hetero Nuclear diatomic molecules.

LO 4: To acquire knowledge of molecular Symmetry & group theory & to solve chemical problems.

LO 5: To write Fortran programs for simple chemical problems.

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Paper III- ORGANIC CHEMISTRY

Paper II- INORGANIC CHEMISTRY

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: To give a basic & updated knowledge for the students on metal clusters, Organometallic chemistry of transition metals.

CO 2: To discuss the preparation, structure & functional aspects of metal clusters.

CO 3: To understand the stability of complexes & factors favorable for stability of the complexes.

CO 4: To discuss basic principles of reaction mechanism in metal complexes.

Learning Outcomes (Los):

Up on completion of the course the student will be able to

LO 1: Explain the idea of metal clusters.

LO 2: Explain the various types of OMC & their preparation, structure & bonding.

LO 3: Verify the 18-electron rule & 16 electron rule in various metal clusters.

LO 4: Determine the stability constants of metal complexes.

LO 5: Explain the kinetics of substitution reaction, conjugate base mechanism & trans effect.

LO 6: Design new coordination compounds based on a fundamental understanding of their reaction mechanism.

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Paper III- ORGANIC CHEMISTRY

Course Objectives (Cos): To make the students

CO 1: Acquire the knowledge of aromatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects.

CO 2: Understand aromatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects.

CO 3: Apply the knowledge & understanding of aromatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects to new situations.

CO 4: Develop interest in areas of aromatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects.

Learning outcomes: At the end of the course, the learners should be able to:

LO 1: Explain & interpret thearomatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects.

LO 2: Compare & analyzearomatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects.

LO 3: Solve & identify thearomatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects.

LO 4: Applyaromatic substitution reactions, Additions involving electrophiles, Nucleophiles & Free radicals, Elimination reactions, mechanism of Named reactions, Spectroscopy, Alkaloids, Purines, Ring structures of glucose & fructose, Anomeric effects.

A.M.A.L. COLLEGE Date..... E.G.

PRINCIPAL
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Paper IV - PHYSICAL CHEMISTRY

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Learn Spectroscopic methods based on magnetic resonance principles.

CO 2: Learn & understand the principle & technique of ESR Spectroscopy.

CO 3: Understand the concepts of Electrochemistry.

CO 4; Understand the basic concept & theories of Electrode – Electrolyte interface.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To apply the Spectroscopic methods for structure elucidation of molecules.

LO 2: To apply the basic concept of Electrochemistry to different electrochemical cells.

LO 3: To acquire knowledge of Electrode – Electrolyte interface.

A.M.A.L. COLLEGE Date..... ANAKAPALLE

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A.M.A.L.COLLEGE, ANAKAPALLE

DEPARTMENT OF P.G. CHEMISTRY

2018 – 2019

M.Sc. (Final) O.C semester – III

Paper I –ORGANIC REACTION MECHANISMS & PERICYCLIC REACTIONS

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Acquire the knowledge of Aliphatic Nucleophilic Substitution mechanisms, Electrophilic Substitutions, Aromatic Nucleophilic Substitution, Radical Substitution mechanism, Molecular Orbital Symmetry, Electrocyclic reactions, Cycloadditions, FMO & PMO Methods.

CO 2: Understand Aliphatic Nucleophilic Substitution, Aliphatic Electrophilic Substitutions, Aromatic Nucleophilic Substitution, Radical Substitution mechanism, Molecular Orbital Symmetry, Electrocyclic reactions, Cycloadditions, FMO & PMO Methods.

CO 3: Acquire the knowledge & Understanding the Aliphatic Nucleophilic, Electrophilic Substitutions, Aromatic Nucleophilic Substitution, Radical Substitution mechanism, Molecular Orbital Symmetry, Electrocyclic reactions, Cycloadditions, FMO & PMO Methods.

CO 4: Develop interest in the areas of Aliphatic Nucleophilic, Electrophilic Substitutions, Aromatic Nucleophilic Substitution, Radical Substitution mechanism, Molecular Orbital Symmetry, Electrocyclic reactions, Cycloadditions, FMO & PMO Methods.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: Explain & Compare the Aliphatic & Aromatic Substitution mechanisms.

LO 2: To interpret Electrocyclic & Cycloaddition reactions.

LO 3: Learn about Radical Substitution Mechanism.

LO 4: To Predict FMO & PMO Methods.

LO 5: Understanding & Predict the Molecular Orbital Symmetry.

LO 6: Learn the difference between Electrophilic & Nucleophilic Substitution reactions.

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Paper II–ORGANIC SPECTROSCOPY - I

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Acquire, Apply & Understanding the knowledge & develop interest in the areas of IR Spectroscopy.

CO 2: Acquire, Apply & Understanding the knowledge & develop interest in the areas of UV Spectroscopy.

CO 3: Acquire, Apply & Understanding the knowledge & develop interest in the areas of NMR Spectroscopy.

CO 4: Acquire, Apply & Understanding the knowledge & develop interest in the areas of Mass Spectroscopy.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: Explain Stretching & Bending vibrations in relation to IR absorption & identify the molecular species that absorb IR Spectroscopy.

LO 2: Explain basic principles, relevant terms & applications of UV - Spectroscopy.

LO 3: Assign ^{1}H &^{13}C NMR Spectra of organic molecules.

- Analyze complex first order multiplets.
- Use data from coupling constants.
- Elucidate the structure of organic molecules.

LO 4: Explain basic principle & instrumentation of Mass Spectroscopy.

- Outline the use of Mass Spectrometry in the determination of relative isotopic masses & for identifying elements.

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Paper III: ORGANIC SYNTHESIS - I

Course Objectives (Cos): To make the students:

C01: Acquire the knowledge of Carbon-Carbon bond formation is the key reaction for organic Synthesis to construct the carbonframework of organic molecules.

CO2:Understand the Carbon - Carbon double bond formation is the Key reaction for organic Synthesis of construct the Carbon frame work of organic molecules.

CO3:Apply the knowledge and understanding of Methods of measuring the molecular weight, polymerization kinetics and copolymerization and polymer processing technology.

CO4: Develop interest in the areas of Learn various asymmetric transformations and employ such reactions in asymmetric organicsynthesis of important chiral molecules.

Learning outcomes- At the end of the course the learners should be able to:

LO1: To identify manydifferent molecular structures can be built from this the versatile atoms. Carbon can easily bond to lots of other elements (C-C)

LO2:To Identify many different molecular structures can be built from this the versatile atoms(C=C). Carbon can easily bond to lots of other elements.

LO3: To identify demonstrate their knowledge of polymers by modeling different situations.

L04: Analyze to make diastereomers out of enantiomers. Because diastertomers have different reactivities.

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Paper IV – NATURAL PRODUCTS AND BIOPOLYMERS -I

Course Objectives: To make the students

CO 1: Special emphasis on mechanisms & orientation of chemical reactions.

CO 2: Basic knowledge regarding general methods of preparation of organic compounds.

CO 3: Knowledge about the mechanism pathways of different class of Natural products.

CO 4: To draw the structures & synthesize simple pharmaceutically active organic compounds.

Learning outcomes: At the end of the course, the learners should be able to:

LO 1: Understand the key pathways for the isolation of Penicillin – G, Cephalosporin- C, Streptomycin etc.

LO 2: Apply principles learnt to the synthesis & biosynthesis of a medicinal natural product & present to peers.

LO 3: Understand the key pathways for the isolation of Alkaloids & structure elucidation, Stereochemistry.

LO 4: Apply principles learnt to the synthesis of Natural pigments.

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DEPARTMENT OF P.G. CHEMISTRY

2018 – 2019

M.Sc. (Final) O.C semester – IV

Paper I –ORGANIC REACTION MECHANISMS & PERICYCLIC REACTIONS

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Explain the Addition Elimination mechanisms.

CO 2: Understand Rearrangements & explain Electrophilic, Nucleophilic & Radical rearrangements.

CO 3: Learn principle of organic Photo chemistry & Photo chemistry of Carbonyl compounds.

CO 4: Learn Photoreaction Photochemistry of enones, unsaturated systems.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: Learn about Addition Elimination mechanisms.

LO 2: To Predict the difference between Electrophilic, Nucleophilic & Radical rearrangements.

LO 3: To Predict the principle & Photochemistry of Carbonyl Compounds.

LO 4: Learn about Photochemistry of Unsaturated systems.

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Paper II–ORGANIC SPECTROSCOPY - II

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Explain the concepts of ORD & CD Spectroscopy & its classification.

CO 2: Understand various 2D-NMR experiments & explain ESR derivative curves.

CO 3: Learn Fragmentation processes in Mass Spectrometry.

CO 4: Explain the structural elucidation of Organic Compounds.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: Learn the Spectroscopic methods: ORD & CD; Circular Birefringence & Cotton effect; difference between ORD & CD.

LO 2: Understand, Predict & use data from 2D-NMR experiments.

LO 3: Understand & Predict the fragmentation process in Mass Spectrometry.

LO 4: Understand & Predict the structural elucidation of Organic Compounds.

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Paper III – ORGANIC SYNTHESIS -II

Course Objectives: To make the students

CO 1: Functional group interconversion & protective group methodology.

CO 2: Modern methods for carbon – carbon & carbon – hetero atom bond formations.

CO 3: Acquire the knowledge of organoboranes preparation by using hydroboration.

CO 4: Acquire the knowledge of preparation & synthetic applications of organo-silanes.

Learning outcomes: At the end of the course, the learners should be able to:

LO 1: Describe methods for synthesis & transformation of most common functional groups.

LO 2: Identify, analyze & evaluate synthetic route to target molecules using retrosynthesis.

LO 3: Analyze preparation of organoboranes by using hydroboration.

LO 4: Apply the knowledge of preparation & synthetic applications of organo-silanes.

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Paper IV – NATURAL PRODUCTS AND BIOPOLYMERS -II

Course Objectives: To make the students

CO 1: Helps in correlating between pharmacology of a disease & its mitigation or cure.

CO 2: To understand the Terpenes & steroids.

CO 3: To know the structure of alkaloids.

CO 4: Knowledge about the basic concepts of structures of RNA & DNA

Learning outcomes: At the end of the course, the learners should be able to:

LO 1: Medicinal chemistry is almost always geared towards drug discovery & development.

LO 2: Analyze the Terpenes & Steroids.

LO 3: Explanation alkaloids

LO 4: Analyze the structure of RNA & DNA, Nucleotides, Heterocyclic bases.

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DEPARTMENT OF P.G. CHEMISTRY

2018 – 2019

M.Sc. (Final) A.C semester – III

Paper I –SEPERATION METHODS - I

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Explain the basic concepts of chromatography along with its principles and methods of development.

CO 2: To explain the principles, general aspects and applications of column, Gel chromatography and capillary electrophoresis.

CO 3: To explain the Theory, principle, Instrumentation and applications of Gas, Affinity and Counter- current Chromatography.

CO 4: To explain the Principle, Instrumentation and Applications of different types of Liquid chromatography.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To apply different chromatographic techniques.

LO 2: To acquire knowledge of handling Instrumentation.

LO 3: To calculate Rf values of different compounds.

LO 4: Understand and analyze Organic, Inorganic molecules, drugs, biomolecules.

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Paper II–QUALITY CONTROL & TRADITIONAL METHODS OF ANALYSIS - I

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Explain characteristics, Evaluation and Reliability of analytical data with regard to Quality Assurance and Management systems.

CO 2: To understand various Decomposition and Dissolution techniques of Inorganic and Organic compounds.

CO 3: Acquire the knowledge regarding Oxidant systems and their applications with respect to basic knowledge regarding Electrochemistry.

CO 4: Develop interest in the areas of classification and analysis of Organic Functional groups.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: Know how to handle laboratory equipment's by following mandatory protocols.

LO 2: To analyze different metals and Ores using various decomposition methods.

LO 3: To calculate potential values of various compounds.

LO 4: Understand and Analyze Organic Functional groups.

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Paper III–APPLIED ANALYSIS - I

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Explain the general techniques of analysis applied to complex materials including Iron, Manganese, Chromite, Phosphate rock and Aluminium ores.

CO 2: Acquire knowledge regarding the analysis of Steel, Refractory materials and fluxes.

CO 3: Develop interest in areas of analysis of Finished products like Soap, Cement, Paints and Oils.

CO 4: To understand various sources, types, effects of Water pollutants and determination of different ions in water.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To analyze different metals and ores using general techniques.

LO 2: To analyze all types of Finished products.

LO 3: To calculate ions concentration by assessing the quality of water sample.

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Paper IV–INSTRUMENTAL METHODS OF ANALYSIS - I

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

To make the students,

CO 1: Explain the principle, general aspects, Instrumentation and applications of UV-Visible and Spectro fluorimetry.

CO 2: Explain the principle, Instrumentation and applications of IR and Raman spectroscopy.

CO 3: Acquire knowledge regarding NMR and ESR Spectroscopies.

CO 4: Develop interest in the areas of Mass and X-Ray spectroscopies.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To apply different spectroscopic methods.

LO 2: To acquire knowledge in handling Instrumentations like NMR and Mass spectrometers.

LO 3: To calculate frequencies and m/z values.

LO 4: To understand and analyze applications of spectroscopies.

LO 5: To know about shielding and De-shielding effects along with chemical shift values.

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DEPARTMENT OF P.G. CHEMISTRY

2018 – 2019

M.Sc. (Final) A.C semester – IV

Paper I –SEPERATION METHODS - II

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: To explain principle, chromatographicmedia, development methods and applications of paper and Thin Layer Chromatography.

CO 2: Acquire knowledge regarding Ion Exchange Chromatography and their applications in different fields.

CO 3: To understand various sampling techniques, samplers and types of sampling in solids, liquids and gases.

CO 4: Develop interest in the areas of Analytical chemistry by explaining its importance in industries and research through solvent extraction.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To analyze cations and anions in different samples using Ion Exchange Chromatography.

LO 2: To calculate R_f values using paper and Thin Layer Chromatography.

LO 3: Understand and analyze types of samplers used for analysis of solids, liquids and gases.

LO 4: To understand special extraction systems and their applications.

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Paper II–QUALITY CONTROL & TRADITIONAL METHODS OF ANALYSIS - II

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: To explain different precipitation methods like co-precipitation, post-precipitation and re-precipitation.

CO 2: To explain gravimetric determinations and Electro-Gravimetric Analysis.

CO 3: Acquire knowledge regarding reductant systems and their applications with respect to basic knowledge regarding electrochemistry.

CO 4: Develop interest in the areas of classification and determination of different types of drugs.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To acquire knowledge regarding precipitation titrations.

LO 2: To understand the concepts like over potential, decomposition potential and their importance.

LO 3: To analyze different drugs using spectroscopic methods.

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Paper III–APPLIED ANALYSIS - II

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

Up on completion of the course the students will be able to,

CO 1: Explain the general techniques of analysis applied to complex materials including Ferro and Non-Ferro Alloys.

CO 2: Acquire knowledge regarding the analysis of soils, Fertilizers and Fuels.

CO 3: To understand the composition, classification, sources, effects, control and Analysis of Air pollutants.

CO 4: Acquire knowledge regarding kinetic methods of Analysis and Non-Aqueous Titrimetry.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: Distinguish between Ferro and Non-Ferro Alloys.

LO 2: To know different types of fertilizers and fuels used along with their composition and grading.

LO 3: To assess Air quality using standard ambient air quality table as reference.

LO 4: To understand types of solvents and indicators in Non-Aqueous Titrimetry.

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Paper IV–INSTRUMENTAL METHODS OF ANALYSIS - II

Course Outcomes (Cos) / Course Specific Outcomes (CSOs):

To make the students,

CO 1: Explain the principle, Theory, Instrumentation and applications of AAS, ICP-AES, ICP-MS and flame photometry.

CO 2: Explain the principle, Instrumentation and applications of TG, DTA and DSC.

CO 3: Acquire knowledge regarding polarography, anode shipping voltammetry and coulometric analysis.

CO 4: To understand different types of ion selective electrodes and their uses along with radio chemical methods of analysis.

Learning Outcomes (Los):

Up on completion of the course the student will be able

LO 1: To analyze concentration of alkali and alkaline earth metals using flame photometry.

LO 2: Quantitative determination of compounds can be done by TG and DTA.

LO 3: Understand different types of currents like residual current, migration current and diffusion current.

LO 4: Acquire knowledge regarding types of electrodes.

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Department of Botany

Course Outcomes w.e.f. 2015-2016 onwards

Sl.No.	Semester	Course Title		Course Outcomes(COs)
1	I	**Microbial diversity, Algae and Fungi**	CO1	Understand the nature and role of Microorganisms like Bacteria & Viruses their uses directly and indirectly
			CO2	Explain Structure, Organization, Physiology, Reproduction & Economic importance of aquatic, autotrophic forms – Algae
			CO3	Explain about non chlorophyllous, heterotrophic forms – Fungi.
			CO4	Devise short write ups about microbial diversity using additional OE resources available in the internet using modern ICT tools.
			CO5	Discuss microrganisms, their control and their right use.
2		**Practical I Microbial diversity, Algae and Fungi**	CO1	Handle carefully microorganisms, Algae & Fungi in the practical lab.
			CO2	Observation of specimens & slides
			CO3	Explain about preparation of bio fertilizers
			CO4	Discuss bio-fertilizers.
3	II	**Diversity Of Archaegoniata e &Plant Anatomy**	CO1	Explain about Bryophytes in which the plant body contains Thalloid or leafy structures
			CO2	Describe the highest group of vascular cryptograms &1st land Plants (Pteridophytes)
			CO3	Discuss the naked seed producing plants (naked seeded Plants of flowering plants) Gymnosperms
			CO4	Outline about a group of higher cryptograms and gymnosperms using additional OE resources available in the internet using modern ICT tools.

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4		**Practical II: Diversity of Archaegoniatae& Plant Anatomy**	CO1	Recognize Bryophytes –slides, sections and mounts.
			CO2	Identify Pteridophytes –slides, sections and mounts.
			CO3	Understand Gymnosperms –slides, sections, and mounts.
			CO4	Observe and identify internal structures of plants.
5	III	**Embryology and Taxonomy**	CO1	Understand the reproduction of plants, Haploid male and female gametes, fertilization of Zygote and embryo formation, embryo development and endosperm.
			CO2	Outline the concepts of Taxonomy with Identification, Nomenclature and various classification of plants using additional OE resources available in the internet using modern ICT tools.
			CO3	Discus about the family's
			CO4	Study on Herbarium and Botanical Gardens
6		**Practical III: Embryology and Taxonomy**	CO1	Understand the Bentham and Hooker's System of Classification.
			CO2	Describe technical description of various plants
			CO3	Observe various Embryology slides.
7	IV	**Plant Physiology and Metabolism**	CO1	Understand Plant physiology, a sub discipline of Botany concerned with functional aspects of plants
			CO2	Remember all internal metabolic activities of plants.
			CO3	Understand Photosynthesis & Respiration process.
			CO4	Explain the growth and development of plants using additional OE resources available in the internetusing modern ICT tools.
			CO1	Understand the transport phenomenon of water and Transpiration.
Sl.No.	**Semester**	**Course Title**		**Course Outcomes(COs)**
8		**Practical Paper IV: Plant Physiology and Metabolism**	CO2	Determine osmotic potential of vacuolar sap by plasmolytic method using leaves of Rhoeo / Tradescantia.
			CO3	Describe mineral deficiency symptoms using plant aterial/photographs.
			CO4	Separate of chloroplast pigments using paper chromatography
			CO5	Rate of photosynthesis under varying CO_2 concentration.
			CO6	Discuss the effect of kind of light intensity, bicarbonate concentration in photosynthesis on oxygen evolution (Hydrilla funnel).

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9	V	**Cell Biology, Geneticsand Plant Breeding**	CO1	Understand the basic components of cell, key role of cell division during cell cycle
			CO2	Explain about inheritance and behaviour of chromosomes using additional OE resources available in the internet using modern ICT tools.
			CO3	Describe Plant Breeding and produce new crop varieties superior to existing types in all.
			CO4	Realize the cell as a structural and functional unit of life, basic components of a cell & explain basic principles.
10		**Practical V: Cell biology, Geneticsand Plant breeding**	CO1	Understand the structure of cell organelles through photomicrographs.
			CO2	Describe the various stages of mitosis using cytological preparation of Onion root tips. Understand DNA packing by micrographs
			CO3	Solving numerical problems using Mendel" Laws of inheritance
			CO4	Explain Hybridization techniques – emasculation, bagging (for demonstration only).
			CO5	Calorimetric estimation of DNA by diphenylamine method
11		**Plant Ecology& Phytogeography**	CO1	Explain various Ecosystems & relationships between Organisms and environment.
			CO2	Describe the Various Eco systems and Plant distribution.
			CO3	Discuss Phytogeography, the major plant communities of the world and differentVegetational belts of the earth with characteristic climatic Conditions of the area.
			CO4	Identify Phyto geographical Regions of India, Plant Biodiversity and its importance using additional OE resources available in the internet using modern ICT tools.
			CO5	Elaborate plant population and community Ecology

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12		**Practical VI: Plant Ecology& Phytogeography**	CO1	Understand the Ecosystem: Types, structure and functions of ecosystem (pond ecosystem). Determine minimal quadrat size and understand herbaceous vegetation in the college campus by species area curve method
			CO2	Discuss productivity of ecosystem-Primary, Secondary and Net productivity
			CO3	Understand Plant succession-Hydrosere and Xerosere
			CO4	Identify the hotspots, phyto geographical regions and distribution of endemic plants in the map of India.
			CO5	Explain Biodiversity, causes and conservation (*In-situ* and *ex-situ* methods) and various methods in Seed banks using additional OE resources available in the internet using modern ICT tools.
			CO6	Discuss importance of nurturing biodiversity.
Sl.No.	**Semester**	**Course Title**		**Course Outcomes(COs)**
13	VI	**Paper – VII - B (Elective) Nursery Gardening and floriculture**	CO1	To understand nursery management and seasonal activities - planting
			CO2	Describe gardening components plant materials and deign
			CO3	To understand the propagation methods
			CO4	Describe the Flory culture
			CO5	Understand the commercial floriculture – methods of Harvesting

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AP STATE COUNCIL OF HIGHER EDUCATION

w.e.f. 2018-19

ZOOLOGY – SEMESTER I

PAPER – I: ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES HOURS: 60 (5X12) Max. Marks: 100

Learning objectives

1. To understand the taxonomic position of protozoa to helminthes.
2. To understand the general characteristics of animals belonging to protozoa to hemichordata.
3. To understand the structural organization of animals phylum from protozoa to hemichordata.
4. To understand the origin and evolutionary relationship of different phyla from protozoa to hemichordata.
5. To understand the origin and evolutionary relationship of different phylum from annelids to hemichordates.

Course Outcomes: By the completion of the course the graduate should able to –

CO1 Describe general taxonomic rules on animal classification
CO2 Classify Protozoa to Coelenterata with taxonomic keys
CO3 Classify Phylum Platy hemninthes to Annelida phylum using examples from parasitic adaptation and vermin composting
CO4 Describe Phylum Arthropoda to Mollusca using examples and importance of insects and Molluscans
CO5 Describe Echinodermata to Hemi chordata with suitable examples and larval stages in relation to the phylogeny

ZOOLOGY PRACTICAL SYLLABUS FOR I SEMESTER ZOOLOGY - PAPER - I
ANIMAL DIVERSITY - BIOLOGY OF NONCHORDATES
Periods: 24 Max. Marks: 50

Learning Outcomes:

- To understand the importance of preservation of museum specimens
- To identify animals based on special identifying characters
- To understand different organ systems through demo or virtual dissections
- To maintain a neat, labeled record of identified museum specimens

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w.e.f. 2018-19

ZOOLOGY –SEMESTER II

PAPER – II: ANIMAL DIVERSITY – BIOLOGY OF CHORDATES HOURS :60 (5X12)

Max. Marks:100

Learning objectives

1. To understand the animal kingdom.
2. To understand the taxonomic position of Protochordata to Mammalia.
3. To understand the general characteristics of animals belonging to Fishes to Reptilians.
4. To understand the body organization of Chordata.
5. To understand the taxonomic position of Protherian mammals.

Course Outcomes:

By the completion of the course the graduate should able to –

CO1 Describe general taxonomic rules on animal classification of chordates

CO2 Classify Protochordata to Mammalia with taxonomic keys

CO3 Understand Mammals with specific structural adaptaions

CO4 Understand the significance of dentition and evolutionary significance

CO5 Understand the origin and evolutionary relationship of different phyla from Prochordata to mammalia.

ZOOLOGY PRACTICAL SYLLABUS FOR II SEMESTER ZOOLOGY - PAPER - II

ANIMAL DIVERSITY - BIOLOGY OF CHORDATES

Periods: 24 Max. Marks: 50

Learning Outcomes:

- To understand the taxidermic and other methods of preservation of chordates
- To identify chordates based on special identifying characters
- To understand internal anatomy of animals through demo or virtual dissections, thus directing the student for "empathy towards the fellow living beings"
- To maintain a neat, labeled record of identified museum specimens

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w.e.f. 2018-19

ZOOLOGY – SEMESTER III

PAPER – III: CELL BIOLOGY, GENETICS, AND EVOLUTION

HOURS:60 (5X12) Max. Marks:100

Learning Objectives

- To understand the origin of cell and distinguish between prokaryotic and eukaryotic cell
- To understand the role of different cell organelles in maintenance of life activities
- To provide the history and basic concepts of heredity, variations and gene interaction
- To enable the students distinguish between polygenic, sex-linked, and multiple allelic modes of inheritance.
- To acquaint student with basic concepts of molecular biology as to how characters are expressed with a coordinated functioning of replication, transcription and translation in all living beings To provide knowledge on origin of life, theories and forces of evolution
- To understand the role of variations and mutations in evolution of organisms

Course Outcomes:

The overall course outcome is that the student shall develop deeper understanding of what life is and how it functions at cellular level. This course will provide students with a deep knowledge in Cell Biology, Animal Biotechnology and Evolution and by the completion of the course the graduate shall able to –

CO1 To understand the basic unit of the living organisms and to differentiate the organisms by their cell structure.

CO2 Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell.

CO3 To understand the history of origin of branch of genetics, gain knowledge on heredity, interaction of genes, various types of inheritance patterns existing in animals

CO4 Acquiring in-depth knowledge on various of aspects of genetics involved in sex determination, human karyo typing and mutations of chromosomes resulting in various disorders

CO5 Understand the principles and forces of evolution of life on earth, the process of evolution of new species and apply the same to develop new and advanced varieties of animals for the benefit of the society

ZOOLOGY PRACTICAL SYLLABUS FOR III SEMESTER
CELL BIOLOGY, GENETICS, MOLECULAR BIOLOGY AND EVOLUTION
ZOOLOGY PAPER III

Course outcomes:

Acquainting and skill enhancement in the usage of laboratory microscope
Hands-on experience of different phases of cell division by experimentation
Develop skills on human karyotyping and identification of chromosomal disorders
To apply the basic concept of inheritance for applied research
To get familiar with phylogeny ad geological history of origin & evolution of animals

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w.e.f. 2018-19

ZOOLOGY – SEMESTER IV

PAPER – IV: EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

HOURS : 60 (5X12) Max. Marks: 100

Learning Objectives

- To achieve a thorough understanding of various aspects of physiological systems and their functioning in animals.
- To instil the concept of hormonal regulation of physiology, metabolism and reproduction in animals.
- To understand the disorders associated with the deficiency of hormones
- To demonstrate a thorough knowledge of the intersection between the disciplines of Biology and Chemistry.
- To provide insightful knowledge on the structure and classification of carbohydrates, proteins, lipids and enzymes
- To demonstrate an understanding of fundamental biochemical principles such as the function of biomolecules, metabolic pathways and the regulation of
- To make students gain proficiency in laboratory techniques in biochemistry and orient them to apply the scientific method to the processes of experimentation and hypothesis testing.

Course Outcomes:

This course will provide students with a deep knowledge in Physiology, Cellular metabolism and Molecular Biology and by the completion of the course the graduate shall able to –

CO1 Describe the key events in early embryonic development starting from the formation of gametes upto gastrulation and formation of primary germ layers.

CO2 Understand the functions of important animal physiological systems including digestion, cardio-respiratory and renal systems.

CO3 Understand the muscular system and the neuro-endocrine regulation of animal growth, development and metabolism with a special knowledge of hormonal control of human reproduction

CO4 Understand the scope of Ecology, Factors of Ecosystem, Nutrient cycle and components of Ecosystem.

CO5 Describe the key events of Ecological Niche, Community Interactions and Zoo Geography

ZOOLOGY PRACTICAL SYLLABUS FOR IV SEMESTER
EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Learning Outcomes:

- Deducing human health based on the information of composition of blood cells
- Identification of different stages of carl embryonic development in animals
- Identification of an organ system with histological structure

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ZOOLOGY – SEMESTER V

COURSE – 5: ANIMAL BIOTECHNOLOGY

HOURS : 60 (5X12) Max. Marks: 100

Learning Objectives:

- To understand the animal cell technology
- To understand the applied Biotechnology, Industry and Agriculture
- Demonstrate basic skills necessary for Biotechnology research
- Promoting application of the techniques for taking up research in higher studies

Course Outcomes:

This course will provide students with a deep knowledge in immunology, genetics, embryology and ecology and by the completion of the course the graduate shall able to –

CO1 To get knowledge tools of R-DNA – Enzymes and Vectors

CO2 To get knowledge techniques of R-DNA technology, cloning Gene delivery, PCR, hybridization.

CO3 Understand the Animal Cell Technology

CO4 To get knowledge of reproductive technologies and transgenic animals

CO5 Understand the applied Biotechnology. Industry, Agriculture.

ZOOLOGY PRACTICAL SYLLABUS FOR V SEMESTER

COURSE-5: ANIMAL BIOTECHNOLOGY

Learning Objectives:

- Demonstrate basic laboratory skills necessary for Biotechnology research
- Promoting application of the lab techniques for taking up research in higher studies

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ZOOLOGY – SEMESTER V

COURSE – 6: ANIMAL HUSBANDRY

HOURS : 60 (5X12) Max. Marks: 100

Learning Objectives

- To know the information live stocks loans and subsidies
- Student understand the different types of Poultry breeds
- Describe the construction of poultry shed
- Understand different types of poultry diseases
- Understand the famous breeds of the world in cattle field

Course Outcomes:

CO1 Students will understand the animal husbandry is a self employment course. With minimum expenditure they can start a poultry farm. They will have an understanding that the government is offering subsidy on loans.
CO2 Students will have understanding about different types of poultry breeds, they know the difference between layers and broilers; know about different types of country breeds.
CO3 Students will know how to construct poultry shed, feed requirements for different chicks, water facilities, different types of cages, etc.
CO4 Students will understand different types of poultry diseases caused by bacteria, viruses, fungus, helminths and protozoans.
CO5 Students will understand different types of cattle breeds, famous breeds of the world in terms of milk production and beef production, they know how to construct a cattle shed, their food requirements and water requirements etc.
CO6 Students will have an idea about deworming, vaccination, weaning of calf, castration and dehorning etc.
CO7 Students will know how to maintain records of a dairy farm.

ZOOLOGY PRACTICAL SYLLABUS FOR V SEMESTER
COURSE – 6: ANIMAL HUSBANDRY

Course Outcomes:

- Study of various breeds of poultry
- Identification of diseases in poultry
- Study of anatomy of poultry
- Study of various activities carried out in a diary Farm

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ZOOLOGY – SEMESTER VI

COURSE – 7(A): IMMUNOLOGY

HOURS : 60 (5X12) Max. Marks: 100

Learning Objectives:

- Get knowledge of the organs of Immune system, types of immunity, cells and organs of immunity.
- Describe immunological response as to how it is triggered (antigens)
- Describe Antibodies
- Understand working of Immune system
- Understand Immune system health and decease, vaccines

Course Outcomes:

CO1 To get knowledge of the organs of Immune system, types of immunity, cells and organs of immunity.

CO2 To describe immunological response as to how it is triggered (antigens)

CO3 To describe Antibodies

CO4 To understand working of Immune system

CO5 To get the knowledge of Immune system health and decease, vaccines

ZOOLOGY PRACTICAL SYLLABUS FOR VI SEMESTER
COURSE – 7(A): IMMUNOLOGY

Course Outcomes:

- Demonstration of lymphoid organs
- Blood groups determination
- Demonstration of ELISA

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ZOOLOGY – SEMESTER VI

COURSE – 8(B): CLUSTER – AQUA CULTURE

Cluster Elective Paper VIII B-1

PRINCIPLES OF AQUA CULTURE

HOURS : 60 (5X12) Max. Marks: 100

Learning Objectives:

- To know the history of Aqua Culture
- Acquire the knowledge of culture systems
- Understand design and construction Aqua Farms
- Describe the management of Carp culture ponds
- To gain the knowledge of culture of shrimp pearl oysters, seaweeds and ornamental fishes.

Course Outcomes:

CO1 Describe general introduction and basics of Aqua Culture

CO2 Describe types of Aqua culture, Culture system and Culture practices

CO3 To know the knowledge of design and construction of Aqua Culture, Seed resources, Nutrition and Feeds.

CO4 Understand the management of carp culture ponds and fresh water prawns

CO5 Understand the culture of shrimp pearl oysters, seaweeds and ornamental fishes.

ZOOLOGY PRACTICAL SYLLABUS FOR VI SEMESTER

COURSE – 8(B): CLUSTER – AQUA CULTURE

Cluster Elective Paper VIII B-1

PRINCIPLES OF AQUA CULTURE

Course Outcomes:

- Identification of fresh water fishes and prawns
- Identification of brackish water fishes and prawns
- Identification of marine water fishes and prawns
- To know the process of cultivation of Giant Prawn
- Identify the culture Seaweeds

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ZOOLOGY – SEMESTER VI

COURSE – 8(B): CLUSTER – AQUA CULTURE

Cluster Elective Paper VIII B-2

AQUA CULTURE MANAGEMENT

HOURS : 60 (5X12) Max. Marks: 100

Course Objectives :

- To get the knowledge of Breeding and Hatchery Management
- To understand water quality Management
- To know Feed Management
- To describe decease managements
- To understand the Economics and Marketing, Fisheries Extension and Fish Genetics

Course Outcomes:

CO1 Understand Breeding and Hatchery Management

CO2 Understand water quality Management

CO3 Describe the Feed Management

CO4 Describe decease managements

CO5 Understand the Economics and Marketing, Fisheries Extension and Fish Genetics.

ZOOLOGY PRACTICAL SYLLABUS FOR VI SEMESTER

COURSE – 8(B): CLUSTER – AQUA CULTURE

Cluster Elective Paper VIII B-2

AQUA CULTURE MANAGEMENT

Course Outcomes:

- Identify the breeding systems
- Practices the use of synthetic Hormones
- To understand the water quality management
- Identification of Oxygen depletion and Aeration
- To understand the Shrimp Larval Nutrition
- To understand the Post harvesting technology

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ZOOLOGY – SEMESTER VI

COURSE – 8(B): CLUSTER – AQUA CULTURE

Cluster Elective Paper VIII B-3

POST HARVEST TECHNOLOGY

HOURS : 60 (5X12) Max. Marks: 100

Learning Objectives

- To understand the principles of fish preservation
- To know the process and preservation of fish by-products
- To get the knowledge of sanitation and quality control
- To gain the knowledge of regulatory affairs in fish industry
- To know the quality assurance, management and certification

Course Outcomes

CO1 Describe Handling and principles of fish preservation

CO2 To get the knowledge of methods of fish preservation

CO3 Understand the processing and preservation of fish and fish by products, Seaweed products

CO4 To describe the sanitation and quality control

CO5 Get Familiar to quality assurance management and certification.

ZOOLOGY PRACTICAL SYLLABUS FOR VI SEMESTER

COURSE – 8(B): CLUSTER – AQUA CULTURE

Cluster Elective Paper VIII B-3

POST HARVEST TECHNOLOGY

Project Work:

- Visit to a fish breeding centre
- Visit to shrimp processing unit

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