Rajiv Gandhi University of Knowledge Technologies

Andhra Pradesh

(Established by the Govt. of Andhra Pradesh and recognized as per Section 2(f) of UGC Act, 1956)

Course Structure and Detailed Syllabi
In
Pre-University Course (PUC)

(Effective from 2023-24 Admitted Batch Onwards)

Nuzvidu Campus::RK Valley Campus:: Srikakulam Campus::Ongole Campus

Contents

COURSE STRUCTURE for MPC

PUC-I SEMESTER-I						
S.NO	**Course Code**	**Name of the Course**	**No. of Credits**	**No.of periods per week**		
				L	**T**	**P**
1	23PEG1101	English-I	4	4	1	0
2	23PMA1101	Mathematics-I	5	5	2	0
3	23PPY1101	Physics-I	4	4	2	0
4	23PPY1110	Physics Lab - I	1	0	0	2
5	23PCY1101	Chemistry - I	4	4	2	0
6	23PCY1110	Chemistry Lab -I	1	0	0	2
7	23PTE1101	Telugu - I	3	3	0	0
8	23PIT1101	Basics in Information Technology	2	2	0	0
9	23PIT1110	Fundamentals of Computer Lab	1	0	0	2
Total			**25**	**22**	**7**	**6**

PUC-I SEMESTER-II

S.NO	Course Code	Name of the Course	No. of Credits	No.of periods per week		
				L	T	P
1	23PEG1201	English-II	4	4	1	0
2	23PMA1201	Mathematics-II	5	5	2	0
3	23PPY1201	Physics-II	4	4	2	0
4	23PPY1210	Physics Lab - II	1	0	0	2
5	23PCY1201	Chemistry - II	4	4	2	0
6	23PCY1210	Chemistry Lab -II	1	0	0	2
7	23PTE1201	Telugu - II	3	3	0	0
8	23PIT1201	Open office & LATEX	2	2	0	0
9	23PIT1210	Open Office & LATEX Lab	1	0	0	2
10	23PBE1202	Elementary Biology	0	2	0	0
Total			**25**	**24**	**7**	**6**

PUC-II SEMESTER-I						
S.NO	**Course Code**	**Name of the Course**	**No. of Credits**	**No.of periods per week**		
				L	**T**	**P**
1	23PEG2101	English-III	4	4	1	0
2	23PMA2101	Mathematics-III	5	5	2	0
3	23PPY2101	Physics-III	4	4	2	0
4	23PPY2110	Physics Lab - III	1	0	0	2
5	23PCY2101	Chemistry - III	4	4	2	0
6	23PCY2110	Chemistry Lab -III	1	0	0	2
7	23PTE2101	Telugu - III	3	3	0	0
8	23PIT2101	Web designing with HTML, CSS, and Introduction to Programming	2	2	0	0
9	23PIT2110	Web deigning using HTML and CSS Lab	1	0	0	2
10	23PBE2102	Elementary Biology	0	2	0	0
Total			**25**	**24**	**7**	**6**

PUC-II SEMESTER-II						
S.No	**Course Code**	**Name of the Course**	**No. of Credits**	**No.of periods per week**		
				L	**T**	**P**
1	23PEG2201	English-IV	4	4	1	0
2	23PMA2201	Mathematics-IV	5	5	2	0
3	23PPY2201	Physics-IV	4	4	2	0
4	23PPY2210	Physics Lab - IV	1	0	0	2
5	23PCY2201	Chemistry - IV	4	4	2	0
6	23PCY2210	Chemistry Lab -IV	1	0	0	2
7	23PTE2201	Telugu - IV	3	3	0	0
8	23PIT2201	Python Programming Language	2	2	0	0
9	23PIT2210	Python Programming Language Lab	1	0	0	2
Total			**25**	**22**	**7**	**6**

COURSE STRUCTURE for MBiPC

PUC-I SEMESTER-I						
S.NO	**Course Code**	**Name of the Course**	**No. of Credits**	**No.of periods per week**		
				L	**T**	**P**
1	23PEG1101	English-I	4	4	1	0
2	23PMA1101	Mathematics-I	5	5	2	0
3	23PPY1101	Physics-I	4	4	2	0
4	23PPY1110	Physics Lab - I	1	0	0	2
5	23PCY1101	Chemistry - I	4	4	2	0
6	23PCY1110	Chemistry Lab -I	1	0	0	2
7	23PTE1101	Telugu - I	3	3	0	0
8	23PIT1101	Basics in Information Technology	2	2	0	0
9	23PIT1110	Fundamentals of Computer Lab	1	0	0	2
10	23PBE1101	Biology-I	3	3	0	0
11	23PBE1110	Biology Lab-I	1	0	0	2
Total			**29**	**25**	**7**	**8**

PUC-I SEMESTER-II

S.NO	Course Code	Name of the Course	No. of Credits	No.of periods per week		
				L	T	P
1	23PEG1201	English-II	4	4	1	0
2	23PMA1201	Mathematics-II	5	5	2	0
3	23PPY1201	Physics-II	4	4	2	0
4	23PPY1210	Physics Lab - II	1	0	0	2
5	23PCY1201	Chemistry - II	4	4	2	0
6	23PCY1210	Chemistry Lab -II	1	0	0	2
7	23PTE1201	Telugu - II	3	3	0	0
8	23PIT1201	Open office & LATEX	2	2	0	0
9	23PIT1210	Open Office & LATEX Lab	1	0	0	2
10	23PBE1201	Biology-II	3	3	0	0
11	23PBE1210	Biology Lab-II	1	0	0	2
Total			**29**	**25**	**7**	**8**

PUC-II SEMESTER-I						
S.NO	**Course Code**	**Name of the Course**	**No. of Credits**	**No.of periods per week**		
				L	**T**	**P**
1	23PEG2101	English-III	4	4	1	0
2	23PMA2101	Mathematics-III	5	5	2	0
3	23PPY2101	Physics-III	4	4	2	0
4	23PPY2110	Physics Lab - III	1	0	0	2
5	23PCY2101	Chemistry - III	4	4	2	0
6	23PCY2110	Chemistry Lab -III	1	0	0	2
7	23PTE2101	Telugu - III	3	3	0	0
8	23PIT2101	Web designing with HTML, CSS, and Introduction to Programming	2	2	0	0
9	23PIT2110	Web deigning using HTML and CSS Lab	1	0	0	2
9	23PB2101	Biology-III	3	3	0	0
10	23PBE2110	Biology Lab-III	1	0	0	2
Total			**29**	**25**	**7**	**8**

PUC-II SEMESTER-II						
S.No	**Course Code**	**Name of the Course**	**No. of Credits**	**No.of periods per week**		
				L	**T**	**P**
1	23PEG2201	English-IV	4	4	1	0
2	23PMA2201	Mathematics-IV	5	5	2	0
3	23PPY2201	Physics-IV	4	4	2	0
4	23PPY2210	Physics Lab - IV	1	0	0	2
5	23PCY2201	Chemistry - IV	4	4	2	0
6	23PCY2210	Chemistry Lab -IV	1	0	0	2
7	23PTE2201	Telugu - IV	3	3	0	0
8	23PIT2201	Python Programming Language	2	2	0	0
9	23PIT2210	Python Programming Language Lab	1	0	0	2
10	23PBE220	Biology-IV	3	3	0	0
11	23PBE2210	Biology Lab-IV	1	0	0	2
Total			**29**	**25**	**7**	**8**

PUC–I
SEMESTER-I

Course code	Course name	Year & Semester	L-T-P	Credits
23PEG1101	**English-I**	**I Year & I Semester**	**4-1-0**	**4**

Course Learning Objectives:

1. To improve the reading skills of the students
2. To inculcate summarizing skills in the student
3. To train the students to discuss important issues raised in the lessons including how to agree and disagree on specific issues
4. To enable the students to speak English with correct pronunciation
5. To enable the students to understand tense and time
6. To train the students to write formal drafts

Course Content:

UNIT-I:
Letter to his Son's Teacher – Abraham Lincoln *(Prose)*, Parts of Speech *(Grammar)*, Prepositions *(Grammar)*

UNIT-II:
Engine Trouble – R.K. Narayan *(Extensive Reading)*, Introduction to Speech Sounds – Consonants, Vowels, Find the odd one out & Silent Letters *(Communication Skills)*

UNIT-III:
She Conquered the Everest – Compiled by B. Sowjanya *(Prose),* Commonwealth of Bees – William Shakespeare *(Poem)*, Word Power *(Communication Skills)*

UNIT-IV:
The Last Leaf – O. Henry *(Extensive Reading)*, Time, Tense, and Aspects *(Grammar)*, Sentence Patterns: (Subject–Verb; Subject–Verb–Object; Subject–Verb–Adjective; Subject–Verb–Adverb; Subject–Verb–Noun) & (simple, compound, complex, and compound-complex sentences)

UNIT-V:
The Portrait of a Lady – Khushwant Singh *(Prose)*, The Syllable *(Communication Skills)*, Articles *(Grammar)*

UNIT-VI:
This is My Prayer to Thee, My Lord! – Rabindranath Tagore *(Poem)*, Modal Auxiliaries *(Grammar)*, Concord: Agreement of Subject and Verb *(Grammar)*

Learning Resources:

Text books:

1. Intermediate 1st Year English Text Book – Board of Intermediate Education, A.P.
2. Hornbill – NCERT English Textbook (Core Course) for Class XI

Reference Books:

1. Phonetics for Indian Students by T. Balasubramaniyan

Course outcomes: At the end of the course, the student will be able to

CO 1	Improve their reading skills
CO 2	Develop their summarizing skills
CO 3	Discuss important issues raised in the lessons including how to agree and disagree on specific issues

CO 4	Speak English with correct pronunciation
CO 5	To understand the use of verbs to express tense and time
CO 6	To write formal drafts of different styles

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course Code	Course Name	Year & Semester	L – T – P	Credits
23PMA1101	Mathematics –I	I Year & I Semester	5-2-0	5

Course Learning Objectives:

1. To study the Concept of Real Line, Functions and Types of Functions.
2. To study the Solutions of linear in equations, linear in equations involving absolute values and the solutions of system of linear in equations.
3. To study the Concept of Sequences, Series and Progressions.
4. To study the sum of Natural numbers, Principle of Mathematical induction.
5. To study the basics of Trigonometric functions and their graphs.
6. To study the basic concepts of straight lines and various forms of straight lines.

Course Content:

Unit - I **(10 Hours)**

STRAIGHT LINES : Cartesian Coordinates, Locus, Slope of a line (Angle between two lines), Various forms of equation of a line, Parallel and perpendicular lines, General equation of a line, Distance of a point from a line(Distance between Parallel lines), Family of lines.

Unit - II **(09 Hours)**

PROGRESSIONS: Sequences and series, Arithmetic progression, Geometric progression, Harmonic progression.

PRINCIPLE OF MATHEMATICAL INDUCTION: Sums of Natural Numbers, Principle of Mathematical Induction.

Unit – III **(14 Hours)**

FUNCTIONS: Introduction to functions, Types of functions, Inverse functions, Exponential function, Logarithmic function, Graphs of functions and Exponential equation.

Unit – IV **(09 Hours)**

LINEAR INEQUALITIES: Linear Inequalities in one variable, Inequalities involving Absolute values, System of linear in equations.

Unit-V **(10 Hours)**

TRIGONOMETRIC FUNCTIONS: Angles and coordinate Lines, Trigonometric functions of acute angles, Trigonometric functions of General angles, Graphs of Trigonometric functions, Reductions to Functions of positive acute angles.

Unit – VI

TRIGONOMETRIC FUNCTIONS OF MULTIPLE ANGLES: **(08Hours)**

Trigonometric functions of two angles, Trigonometric functions of multiple angles, Trigonometric functions of Sub-Multiple angles, Inverse Trigonometric functions.

Learning Resources:

Text book:

1. *"CALCULUS OF EARLY TRANSCENDENTALS"* George B. Thomas, Jr. Maurice D. Weir, Joel Hass, *Thomas*, 12th Edition.

Reference Books:

i) *"TELUGU ACADEMI MATHEMATICS"*- IA, IB.

ii) *"NCERT MATHEMATICS"* - 11th Grade, 12th Grade (Part-1 and Part-2)

iii) *"Plane Trigonometry", S*.L.Loney, Cambridge at the University Press 1893, AITBS Publishers, India.

iv) *"CALCULUS OF EARLY TRANSCENDENTALS"* James Stewart 8th Edition.

Web resources:

1. RGUKT course content

Course outcomes: At the end of the course, the student will be able to

CO 1	Learn the basic concepts on real line, functions, Domain and range of a given function and different types of functions.
CO 2	Compute the solutions sets for the given linear inequations and represent of the solutions sets through graphically.
CO 3	Learn the sequences and series, progressions and Induction procedure to prove a given statement.
CO 4	Learn the sums of Natural numbers and able to prove the generalized statements using Principle of Mathematical induction.
CO 5	Learn the basic definition of the six trigonometric functions and their graphs, values of the trigonometric functions for all types angles
CO 6	Learn the basic concepts of straight lines and various forms of straight lines

Assessment Method:

Course Nature		**Theory**	
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY1101	Physics-I	I Year & I Semester	4-2-0	4

Course Learning Objectives:

1. To enable the students to understand the importance and the usage of units of physical quantities and identification of error percentage in physical quantities.
2. Students will learn the importance of scalar and vector geometry in understanding thephysical quantities.
3. Students will learn important parameters in kinematic equations of motion and different projectile motions in a plane.
4. Students will learn Newton‟s law of motion in an inertial and non-inertial frame of references under the influence of forces.
5. Students will learn the basic definition of work, energy and power and its applications in real life besides gravitation field.
6. Students will learn the phenomenon of conservation of energy with applications of elastic and inelastic collisions.

Course Content:

Unit I: Physical World, Units & Measurement (08 Hours)
Units and system of units, fundamental units, measurement of Length, mass and time, derived units, Accuracy, Precision of Instruments and errors in measurements, significant figures, , Dimensions of Physical Quantities, Dimensional formulae and dimensional equations, Dimensional Analysis and its Applications.

Unit II: Motion in a straight line & Vectors (12 Hours)
Position, path length and displacement, Average velocity and average speed, Instantaneous velocity and speed, Acceleration, Kinematic equations for uniformly accelerated motion. Scalars and vectors (position and displacement vectors, equality of vectors), multiplication of vectors by real numbers, Addition and subtraction of vectors by graphical method (Triangle law) Proof for Parallelogram law of vector addition, Resolution of vectors

Unit III: Motion in a plane (08 Hours)
Position vector and displacement, velocity vector, acceleration vector, Projectile motion (Equation of path of a projectile, time of flight, maximum height, horizontal range), horizontal projectile motion, Uniform circular motion.

Unit IV: Laws of Motion (12 Hours)
Newton's law of motion, momentum, impulse conservation of momentum, equilibrium of a particle, Friction, types of friction, relation between inclined angle and coefficient of friction, acceleration of block moving on inclined plane, block and trolley system, Uniform circular motion, motion of a car on a level road, motion of a car on a banked road (with friction and without friction

Unit V: Work, Energy and Power **(10 Hours)**
Scalar product of vectors, work, kinetic energy, work-energy theorem (constant and variable force), potential energy, conservation of mechanical energy with examples, Potential energy of a spring, Energy graph, Power, collisions: elastic and inelastic collisions in one dimension

UNIT- VI: Systems of particles and Rotational motion-I **(12 Hours)**

Centre of mass (two particle system and 'n' number of particles), Motion of centre of mass, Vector product of vectors, Angular velocity and its relation with linear velocity, Angular acceleration, Torque and Angular momentum for a system of particles, conservation of angular momentum

Learning Resources:

Text book:

1. *"Physics Part-1, Text Book for Class XI ",* National Council of Educational Research and Training, 2006

Reference Books:

1. *"University Physics"*, Sear"s and Zemansky, Pearson Edition.
2. "Fundamentals *of Physics",* D. Halliday, R. Resnick and J. Walker, *6th Edition,* John Wiley and Sons, New York (2001).
3. "Concept of Physics part-1", HC Verma, 2017 Edition

Web resources:

1. RGUKT course content
2. NPTEL physics: IIT-PAL
   URL: https://www.youtube.com/channel/UCwNr8peMxn8-Nc2V_RZsRvg/videos
3. Ashish Arora, Physicsgalaxy video lectures, 2015
   URL: https://www.youtube.com/user/physicsgalaxy74

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand the importance of units of physical quantities and how the units can be related with dimensional analysis. The student will get adequate knowledge on the difference between accuracy and precision of a measurement and also able to analyze errors in a measurement.
CO 2	Understand the concepts of vectors & scalars and properties relating to them.
CO 3	Understand the concept of motion of an object in terms of its position, velocity and acceleration without external force.
CO 4	Get adequate knowledge on fundamental laws of motion. Student will able to solve problems related to motion of the objects under the influence of external forces.
CO 5	Understand the concept of work, energy and power and its applications
CO 6	Understand the concept conservation of momentum & energy of a physical body. Student will acquainted with the concept of collision quantitatively.

Assessment Method:

Course Nature	**Theory**		
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY1110	Physics Lab –I	I Year & I Semester	0-0-2	1

Course Learning Objectives:

The student will gain practical knowledge and basic method/ techniques to measuring small objects lengths/ areas/ volumes. Further, the student will gain basics knowledge on verifying the equation of kinematics in two dimensions.

1. Students will learn how to measure the different Physical quantities such as length, thickness, radius and volume of different objects by using Vernier-caliper, Screw Gauge, Spherometer.
2. Students will learn how to verify the different laws in kinematics and dynamics of physics such as acceleration due to gravity on an inclined plane.
3. Students will learn how to measure the weight of a given body using parallelogram law of vector addition.

Course Content:
Details of the Experiments:

1. Error analysis and graphical methods (Theory)
2. Determination of Density of regular body by using Vernier-Calipers.
3. Determine the thickness of a Glass slide and radii of different wires using Screw Gauge.
4. Determination of radius of curvature of the curved surface.
5. Determining the coefficient of friction on an inclined plane.
6. Determine the weight of a given body using parallelogram law of vector addition.

Web resources:

1. URL: http://www.olabs.edu.in/?pg=topMenu&id=40

Course Outcome:

1. Students can understand how to measure the different physical quantities such as length, thickness, radius and volume of different objects by using vernier callipers, screw gauge, spherometer.
2. Student will understand the concept of coefficient of friction and how to measure coefficient of friction on an inclined plane.

Assessment Method:

Course Nature		Practical (Lab courses only)		
Assessment Tool	Experiments	Record	Viva-Voce/Quiz/MCQ/Lab Project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course Code	Course Name	Year & Semester	L – T – P	Credits
23PCY1101	Chemistry- I	I Year & I Semester	4 – 2 – 0	4

Course Learning Objectives:

1. To acquire knowledge about atomic structure and stability of an atom
2. To gain the knowledge of periodic classification, periodic properties and factors affecting these properties.
3. To acquire basic knowledge chemical bonding, types, characteristics and stability.
4. To acquire the knowledge of fundamental gas properties and establish relation between them.
5. To get knowledge balancing of chemical equations.
6. To understand the properties of liquids and colligative properties

Course Content:

UNIT-I: Basic concepts and Stoichiometry **(12 Hours)**

Atomic and molecular masses, naming of inorganic compounds, mole concept, the concept of molecular weight and equivalent weight. Percentage composition, calculations of empirical, molecular formulae. Balancing of chemical equations and stoichiometry, calculation of oxidation number and balancing Redox reactions using oxidation number method and ionelectron method.

UNIT-II: Atomic Structure **(10 Hours)**

Wave nature of light, Plank's quantum theory and Photoelectric effect, Line spectra and Bohr's model, hydrogen spectra, limitations of Bohr's model. Wave nature of matter, DeBroglie's relationship, Heisenberg uncertainty principle. Schrodinger's wave equation and atomic orbitals, Quantum numbers, Rules for filling electrons in orbitals (Aufbau, Hund's & Pauli's principle), Electronic configuration of atoms.

UNIT-III: Periodic Classification **(08 Hours)**

Modern periodic law, Classification of elements. Periodicity and periodic trends in atomic radii and ionic radii. Ionization energy, successive ionization energies, periodic trends in first ionization energies. Electron affinity, electronegativity, metals, non-metals, and metalloids, valency.

UNIT-IV: Chemical Bonding **(12 Hours)**

Types of chemical bonds - ionic, covalent, metallic and co-ordinate covalent bond. Bond 7 polarity and dipole moment, Lewis symbols and Octet rule. Drawing Lewis structures and formal charge calculation. Valence bond theory-its limitations, VSEPR theory, concept of hybridization-postulates, the formation of sp, sp2 , sp3 , sp3 d and sp3 d 2 hybrid orbitals. Molecular orbital theory, molecular orbital energy level diagrams (H2 to F2). Inter molecular forces and hydrogen bonding, classification, and its consequences.

UNIT-V: Gaseous State **(11 Hours)**

Introduction to gases, characteristics, units of pressure, Gas laws-Boyle's law, Charles's law and Avagadro's law. Derivation of the ideal gas equation. Applications of ideal gas equation (Gas densities and molar mass), Dalton's Law of Partial pressures, and mole fractions. The kinetic molecular theory of gases-postulates and derivation of gas laws. Types of molecular velocities-average velocity, most probable velocity & RMS velocity. Deviation of Ideal behavior (van der Waal's gas equation concept and equation only). Graham's law of diffusion.

UNIT-VI: Solutions **(08 Hours)**

Solutions and their properties, percent concentrations (w/w%, w/v% and v/v%), concentrationterms-molarity, normality, molality, mole fraction and parts per million. Colligative properties of solutions-Vapor pressure, and boiling point, lowering of vapor pressure, elevation of boiling point, depression of freezing point and osmotic pressure. Determination of molar mass from colligative properties.

Learning Resources:

Text books:

1. *"Chemistry, Text Book for Class XI"*, National Council of Educational Research and Training, 2006
2. *"Chemistry Text Book for Intermediate First year",* Board of Intermediate AP

Reference Books:

1. *Elements of Physical Chemistry*, by **Peter Atkins** and **Julio de Paula,** 7^{th} Edition
2. *Concise Inorganic Chemistry*,by **J.D. Lee,** 5^{th} Edition
3. *Chemistry-The central science,* by **Theodore L. Brown,** 13^{th} Edition,
4. *Chemistry and chemical reactivity,* by **John C. Kotz and Paul M. Treichel,** 9th Edition
5. *Chemistry: Principles and reactions,* by **Masterton, Hurley and Neth,** 7^{th} Edition

Web resources:

1. RGUKT course content
2. URL: https://swayam.gov.in/chemistry/c/4/science

Course outcomes: At the end of the course, the student will be able to

CO 1	Know the atomic structure and stability of an atom in detail
CO 2	Analyze the importance of periodic table and explain various periodic properties
CO 3	Determine the structure of simple molecules and predict the bond order
CO 4	Know the behavior of ideal gases and their deviation to real gases
CO 5	Balancing the chemical equations and finding the percentage compositions
CO 6	Know about the liquid state of matter and colligative properties

Assessment Method:

Course Nature :Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course Code	Course Name	Year & Semester	L – T – P	Credits
23PCY1110	Chemistry Lab-I	I Year & I Semester	0 – 0 – 2	1

Course Learning Objectives:

1. To learn how to purify few of inorganic and organic compounds
2. To learn how to prepare a standard solution and its standardization

Practical Syllabus:

1. Crystallization involving impure sample of any one of the following: Alum, copper sulphate, Benzoic acid.
2. Preparation of Mohr's salt
3. Preparation of standard solution of oxalic acid.
4. Preparation of colloidal solutions

Text book:

1. *Vogel"s Quantitative Chemical Analysis*, 5th Edition

Course Outcomes:

At the end of the course, the student will be able to prepare few double salts, organic compounds and standard solutions.

Assessment Method:

Course Nature		Practical (Lab courses only)		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PTE1101	**తెలుగు**-1	**I Year & I Semester**	**3-0-0**	3

Course Learning Objectives:

1. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
2. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
3. యయాతి కథలో తండ్రి కొడుకుల మధ్య ఉన్న సంబంధాన్ని సరిగా అర్థం చేసుకోవాలి. తండ్రి కోసం కొడుకు త్యాగాన్ని గురించాలి. తండ్రి కొడుకు కు చేసే హితబోధను గుర్తించాలి.
4. మహాప్రస్థానంలో ఉన్న చైతన్యాన్ని జయభేరిలో పేదల పక్షంలో ఎలా కవిత్వీకరించి చూపారో శ్రీశ్రీ వివరించడం ద్వారా తెలుసుకోవాలి.
5. పులి, నక్క లాంటి స్వభావం ఉన్న మానవ ప్రవర్తనల్ని సరిగా అర్థం చేసుకునేలా గ్రహింపజేయాలి.
6. తండ్రీ కూతుళ్ళ మధ్య ఉన్న అనుబంధాన్ని గుర్తించేలా బోధించాలి. సంధుల ద్వారా వ్యాకరణ పరిజ్ఞానాన్ని తెలుసుకునేలా చేయాలి.

Course Content:

UNIT– I: తెలుగుజాతి వివేకం1-25 పద్యాలు (6 మాడ్యూల్స్) (05 Hours)
UNIT – II: తెలుగుజాతి వివేకం **26 -40** పద్యాలు (**3** మాడ్యూల్స్) (**05 Hours)**
UNIT – III: యయాతి హితవు – నన్నయ్య (**10**మాడ్యూల్స్) (**10 Hours)**
UNIT – IV: జయభేరి (**2**మాడ్యూల్స్) (**3 Hours)**
UNIT –V: వ్యాఘ్రగోమాయు సంవాదం – తిక్కన (**8** మాడ్యూల్స్). (**10 Hours)**
UNIT – VI:అంపకం(**4**మాడ్యూల్స్) **సంధులు** (2మాడ్యూల్స్), (0**7 Hours)**

తెలుగు సంధులు: అత్త్వసంధి, ఇత్త్వసంధి, ఉత్త్వసంధి, యడాగమసంధి, గసడదవాదేశసంధి, ద్రుతప్రకృతిక సంధి (సరళాదేశసంధి) సంస్కృత సంధులు: సవర్ణదీర్ఘసంధి, గుణ సంధి,వృద్ధిసంధి, యణాదేశసంధి(వీటికి కంటెంట్ తయారు చేయాలి. అనుమానోపపత్తి పద్ధతి ద్వారా **{**ఉదాహరణ ద్వారా సూత్రాన్ని రాబట్టడం**}**సాధారణ ఉదాహరణలు, సూత్రం రాయాలి)

ఆధారాలు:

1. తెలుగు జాతి వివేకం పుస్తకం
2. నన్నయ భారతం
3. మహాప్రస్థానం శ్రీశ్రీ
4. తిక్కన భారతం
5. ఇంటర్ మొదటి సంవత్సరం పాఠ్యగ్రంథం
6. తెలుగు వ్యాకరణం

Course outcomes:

CO1	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకుంటారు.
CO2	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో తెలుసుకొంటారు.
CO3	యయాతి కథలో తండ్రి కొడుకుల మధ్య ఉన్న సంబంధాన్ని సరిగా అర్థం చేసుకుంటారు. తండ్రి కోసం కొడుకు త్యాగాన్ని, తండ్రి కొడుకు కు చేసే హితబోధను గుర్తించి అవగతం చేసుకొంటారు.
CO4	మహాప్రస్థానంలో ఉన్న చైతన్యాన్ని జయభేరిలో పేదల పక్షంలో ఎలా కవితీ్వకరించి చూపారో శ్రీశ్రీ వివరించడం ద్వారా తెలుసుకుంటారు.
CO5	పులి, నక్క లాంటి స్వభావం ఉన్న మానవ ప్రవర్తనల్ని సరిగా అర్థం చేసుకునేలా గ్రహిస్తారు.
CO6	తండ్రీ కూతుళ్ళ మధ్య ఉన్న అనుబంధాన్ని గుర్తిస్తారు. సంధుల ద్వారా వ్యాకరణ పరిజ్ఞానాన్ని తెలుసుకుంటారు.

Assessment Method:

Course Nature :Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT1101	Basics in Information Technology	I Year & I Semester	2-0-0	2

Course Learning Objectives:

1. Student will learn the fundamental concepts of computers
2. Student will learn the differentiation between hardware and software devices
3. Student will identify different Number systems and learn conversions
4. Student will know the concepts of Gates.
5. Student will be familiar with different types of Networks after completion of this course.
6. Student will understand what the Internet is, how to access it and what it can be used for.

Course Content:

Unit I: Fundamentals of Computer: (04 Hours)
Introduction to Computer, History, Advantages and Disadvantages of computer; Characteristics of Computer, Computer Generations and Computer Types; Block Diagram; Process of Booting.

Unit II: Computer Hardware & Software (03 Hours)
Input Devices and Output Devices; Computer Ports; Memory, Storage Devices and Memory Units; Introduction to software, Types of Software and Utility Software, Application Software; System Software (OS);

Unit III: Basics of Number Systems (05 Hours)
Number Systems Introduction and Language of Bits (Bit, Byte, KB, MB, TB, PB etc.,); Direct Conversions; Indirect Conversions

Unit IV: Boolean Logic (03 Hours)
OR, AND, NAND, NOR, XOR, NOT, truth tables; Use of Boolean operators (AND, OR)

Unit V: Basics of Networking (04 Hours)
Evolution of Networking: ARPANET, Bandwidth (Hz, KHz, and MHz) and Data transfer rate (bps, Kbps, Mbps, Gbps, Tbps); Network Types based on Area (LAN, WAN, MAN, PAN) and Connection Type (Wired and wireless); Network Types based on Topologies: Point-to-Point, BUS, Ring, Mesh, Star, Hybrid; Network Types based on Architecture: Client/Server, Peer-to-Peer, Network Applications;

UNIT- VI: Internet & Cyber-Safety (05 Hours)
What is Internet, Internet Evolution, Advantages and Disadvantages; URL, DNS, Extensions of websites; Web Browser types and Browser errors;
Safely Browsing the web and using networks: identity protection, proper usage of passwords, privacy, confidentiality of information, cyber stalking, reporting cybercrimes, safely accessing websites: viruses and malware

Learning resources
Text book:

1. *CBSE XIth Standard Computer Science Text book*
2. *Fundamentals of Computers by Reema Theraja, Oxford Publications*

Reference Books:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.

Web resources:

1. RGUKT course content
2. http://cbse.nic.in/ePub/webcbse/webcbse/Computer%20Science%20%20(Class-XI)/index.html
3. https://www.tutorialspoint.com/computer_fundamentals/index.htm

Course outcomes: At the end of the course, the student will be able to

CO 1	Identify the basic components of computer like input, output devices
CO 2	Understand the difference between an hardware and software devices and its functionality
CO 3	Recognize the different types of Networks and how to accessing Local Area Network
CO 4	Understand the different types of Number system and how to made conversions.
CO 5	Understand Logic Gates and truth tables
CO 6	Perform to connect Internet and access different websites.

Assessment Method:

Course Nature :Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT1110	Fundamentals of Computer Lab	I Year & I Semester	0-0-2	1

Course Learning Objectives:

The objective of this course is to know the computer fundamentals, work with different unix commands, email id creations and basic number system systems

1. Enable to work with different basic applications on computer
2. Enable to work on computer different unix commands
3. Enable to know how to create and use email id
4. Enable to practice on basic number systems.
5. Enable to work on LAN connectivity

Course Content:

Details of the Experiments

1. PC Hardware Identification of basic peripherals, installation of system software in Linux. Troubleshooting Hardware and software some tips, tricks usage of applications.
2. Create and manage files and folder tree
3. Use Accessories Utilities Of Ubuntu OS
4. Internet & World Wide Web: Usage of the internet, web browsers, email, newsgroups and discussion forums .Awareness of cyber hygiene (protecting the personal computer from getting infected with the viruses), worms and other cyber attacks .
5. Practice creating e-mail accounts, sending, receiving & storing of mails
6. Practice on basic number systems and Boolean logic gates
7. Practice on different basic ubuntu terminal commands.
8. Practice on Internet connectivity with LAN and Wifi, access of content in intranet

Course Outcome:

1. Understand how to work on computer with various applications available
2. Understand how to create and manage files and folders
3. Understand how to surf useful information using browser through internet
4. Know about how to use email
5. Know about different basics terminal commands in ubuntu
6. Know about how to connect network and access links through intranet and internet

Assessment Method

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE1101	Biology-I(MBiPC)	I Year & I Semester	3-0-0	3

Course Learning Objectives:

1. To enable the students to understand cell structure of prokaryotic and eukaryotic cell.
2. Students will learn about the cell division processes.
3. Students will explore surroundings and observe, group or classify organisms, phenomena and processes based on certain characteristics.
4. Explore surroundings and differentiate plants, phenomena and processes based on certain characteristics.
5. Explore surroundings and differentiate animals, phenomena and processes based on certain characteristics.
6. Students will learn about the biomolecules of life.

Course Content:

UNIT-I **(09 Hours)**

Cell: Cell theory; Structure of Prokaryotic and Eukaryotic Cell; Cell Membrane, Cell wall; Cell organelles-Structure and Function: Endoplasmic Reticulum, Golgi Bodies, Lysosomes, Vacuoles; Mitochondria, Ribosomes, Plastids, Microbodies; Centrioles

UNIT-II **(07 Hours)**

Nucleus: Nuclear Membrane and Nucleoplasm

Cell Cycle and Cell Division: EukaryoticCell Cycle, Mitosis, Meiosis and their Significance

UNIT-III **(09 Hours)**

Diversity in The Living World

The Living World: Biodiversity (Definition); Need for Classification; Concept of Species and Taxonomic Hierarchy; Binomial Nomenclature; Tools for Study of Taxonomy- Herbaria, Botanical Gardens, Museums, Zoological Parks and Taxonomic Key.

Biological Classification: Basic principles of Classification, Five Kingdom Classification, Viruses, Viroids and Prions.

UNIT-IV **(07 Hours)**

Plant Kingdom: Classification of Plants: Salient Features of Eichler‟s Classification of Plants (characteristic features with two Examples).

UNIT-V **(06 Hours)**

Animal Kingdom: Basis of Classification: Levels of Organization, Symmetry, Diploblastic and Triploblastic Organization, Coelom, Segmentation, Notochord; Phyla Level and Chordate up to Classes

UNIT-VI **(07 Hours)**

Structure and Functions

Biomolecules: Chemical Constituents of Living Cells: Biomolecules-Structure and Function of Proteins, Carbohydrates, Lipid, Nucleic Acids; Enzymes- Properties, Enzyme Action.

Learning Resources:

Text book:

1. The Cell: A Molecular Approach Book by Geoffrey M. Cooper
2. NCERT (Biology) and Telugu Academy (Zoology and Botany)

Reference Books:

1. '*Molecular Cell Biology' by* D. Baltimore, H. Lodish, W HFreeman & Co; 4th edition, (2002)
2. '*Cell Biology, Genetics, Evolution and Ecology' by* P. S. Verma and V. K. Agarwal, S Chand Publications, 2022.
3. '*Microbiology' by* M. Pelczar, McGraw-Hill Education (1998)
4. '*Fundamentals of Biochemistry: Life at the Molecular level by* D.Voet, J.G. Voet, C.W. Pratt, 5th edition, (2016)
5. '*Principles of Biochemistry' by* A. L. Lehninger, D. L. Nelson, M. M.Cox, & W. H. Freeman, (2000)

Web resources:

1. RGUKT course content
2. www.khanacademy.org

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand the difference between prokaryotic and eukaryotic cells.
CO 2	Understand the difference between mitosis and meiosis cell division.
CO 3	Differentiates organisms, phenomena and processes based on certain characteristics and salient features, such as, prokaryotes and eukaryotes.
CO 4	Understand principles of classification of plants
CO 5	Understand principles of classification of animals.
CO 6	Understand about the biomolecules‟ structure and their functions.

Assessment Method

Course Nature:Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE1110	Biology Lab-I(MBiPC)	I Year & I Semester	0-0-2	1

Course Learning Objectives:

1. To study different parts of a compound microscope.
2. They will understand about the invertebrates
3. They will understand about vertebrates.
4. They will gain knowledge about cell division.
5. They will learn to estimate the sugars and starch.

Course Content:
Details of the Experiments:

1. Study of a simple and compound microscope.
2. Spotters of Invertebrate phyla.
3. Spotters of vertebrate phyla.
4. Squash preparation of onion root tip for identification of mitosis stages.
5. Qualitative estimation of simple sugars and starch.

Web resources:

1. RGUKT course content
2. https://labinapp.com/resources/class-11-biology/

REFERENCES:

1. AP Biology Investigative Labs: An Inquiry Based Approach.

Course Outcome:

1. Students can understand how to use the microscope and study the organism or structure by microscope.
2. Student will able to explore the knowledge about the invertebrates
3. Student will able to explore the knowledge about the vertebrates.
4. Student will understand the about the different stages of cell devision.
5. Student will able to do find out the concentration of sugar and starch.

Assessment Method:

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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PUC–I
SEMESTER-II

Course code	Course name	Year & Semester	L-T-P	Credits
23PEG1201	**English-II**	I Year & II Semester	**4-1-0**	**4**

Course Learning Objectives:

1. To help the students compare and contrast objects, processes, and persons described in the lessons.
2. To enable the students to appraise the merits and demerits of a proposition.
3. To enable the students to develop and expand their ideas.
4. To refresh the skills of the students in the area of change of voice and reporting of speeches.
5. To help the student to identify the clauses of a sentence and to rewrite them.
6. To improve the interpersonal skills and confidence of the students through Role-Plays.

Course Content:

UNIT-I:
What Makes a Nation? – C. Rajagoapalachari *(Prose)*, Communicating Better (Exercises 1–10) *(Communication Skills)*, Question Tags *(Grammar)*

UNIT-II:
As I Grew Older – Langston Hughes *(Poem)*, Ranga's Marriage – Masti Venkatesha Iyengar *(Prose)*, Degrees of Comparison *(Grammar)*

UNIT-III:
If – Rudyard Kipling *(Poem)*, Conditionals *(Grammar)* Reported Speech *(Grammar)*

UNIT-IV:
To a Student – Kamala Wijeratne *(Poem)*, Active Voice and Passive Voice *(Grammar)*

UNIT-V:
Will He Come Home? – P. Sathyawathi (Translated by Y. Padmavathi) *(Extensive Reading)*, Phrasal Verbs *(Grammar)*, Clause Analysis and Synthesis of Sentences *(Grammar)*

UNIT-VI:
The summer of the Beautiful White Horse – William Saroyan *(Prose)*, Correction of Sentences *(Grammar),* Role-Play & JAM Sessions *(Hands-on activities)*

References:

Text books:

1. Intermediate 1st Year English Text Book – Board of Intermediate Education, A.P.
2. Snapshots – NCERT Supplementary Reader in English for Class XI
3. Archives of RGUKT Content (Poem–IF)

Course Outcomes*:* At the end of the course, the student will be able to

CO 1	Compare and contrast objects, processes, and persons described in the lessons
CO 2	Appraise the merits and demerits of a proposition

CO 3	Develop and expand their ideas on specific issues
CO 4	Refresh their skills in the area of change of voice and reporting of speeches
CO 5	Identify the clauses of a sentence and to rewrite them
CO 6	Improve the interpersonal skills and confidence of the students through Role-Plays

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course Code	Course Name	Year & Semester	L – T - P	Credits
23PMA1201	Mathematics –II	I Year & II Semester	5-2-0	5

Course Learning Objectives:

1. To study the Trigonometric Relations and the Solutions of Trigonometric Equations.
2. To study the basic concepts of Complex numbers, De Moviers Theorem, Quadratic equations, expressions and their solutions, maximum and minimum values of quadratic equations.
3. To study the concept of the limit and formal definition of the limit, and discuss of continuity of various functions.
4. To study the concept of differentiability of a given function on a given interval and higher order derivatives.
5. To study the chain rule in differentiation and to find the derivative implicitly defined functions.
6. To study the strategy of graphing a curve on its domain and optimize a given function.

Course Content:

Unit- I **(12 Hours)**

TRIGONOMETRIC RELATIONS: Transformation Formulas, Conditional Trigonometric Identities, Trigonometric Equations, Relation between the Angles and Sides of a triangle, Properties of triangles.

Unit – II **(12 Hours)**

COMPLEX NUMBERS & QUADRATIC EQUATIONS: Concept of Complex Numbers, Algebra of Complex Numbers, Complex Plane, Polar Form, De Moivre‟s Theorem, Quadratic equations in one variable, Equations reducible to quadratic equations, Forming quadratic equations with given roots and quadratic expressions.

Unit- III **(16 Hours)**

LIMITS AND CONTINUITY: Rates of change, Concept of a limit, Rules for finding limit, Formal definition of limit, Extension of the limit concept, Infinite limits, some special limits, Continuity at a point, Rules of continuity, Continuity on intervals, Tangent lines.

Unit - IV **(10 Hours)**

DIFFERENTIATION: The Derivative of a function, Derivatives and continuity, Differentiation rules – Sums and Differences, Differentiation rules – Products and Quotients, Second and higher order derivatives, Derivatives of trigonometric functions, Continuity of trigonometric functions.

Unit - V **(07 Hours)**

CHAIN RULE AND IMPLICIT DIFFERENTIATION: The chain rule, Differentiation formulas that include the chain rule, Implicit differentiation, Tangent and normal lines, Rational powers of differentiable functions.

Unit - VI **(18 Hours)**

APPLICATIONS OF DERIVATIVES: Extreme values of functions, Finding extrema, Rolle's Theorem, Mean value Theorem, Increasing and Decreasing functions, The first Derivative test, Curve Sketching, The second Derivative Test, Strategy for Graphing, Asymptotes and dominant terms, Optimization, Differentials.

Learning Resources:

Text book:

1. *"CALCULUS OF EARLY TRANSCENDENTALS"*,George B. Thomas, Jr. Maurice D. Weir, Joel Hass, *THOMAS"* 12th Edition.

Reference Books:

1. *"TELUGU ACADEMI MATHEMATICS"*- IA, IB
2. *"NCERT MATHEMATICS"* - 11th Grade, 12th Grade (Part-1 and Part-2)

Web resources:

1. RGUKT course content

Course Outcomes: At the end of the course, the student will be able to

CO 1	Learn the Trigonometric Relations and the Solutions of Trigonometric Equations
CO 2	Learn the complex numbers whose rectangular form and polar form, finding the roots, framing the quadratic equations and their extreme values.
CO 3	Learn the concept of the limit and formal definition of the limit, and discuss of continuity of various functions.
CO 4	Learn the concept of differentiability of a given function on a given interval and higher order derivatives.
CO 5	Learn the chain rule in differentiation and to find the derivative Implicitly defined functions.
CO 6	Learn the strategy of graphing a curve on its domain and optimize a given function.

Assessment Method:

Course Nature		**Theory**	
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY1201	Physics-II	I Year & II Semester	4-2-0	4

Course Learning Objectives:

1. To gain the basic knowledge on the motion of system of particles with concept of center of mass, momentum of inertia with rigid body dynamics.
2. To gain the basic knowledge on the universal law of gravitation and its application the motion of the satellites under the gravity.
3. To advance knowledge on the mechanical properties of solids and fluids.
4. To gain the detail knowledge on the heat energy and its behaviour on matter while transfer. In addition the basic fundamental law of thermodynamics and various thermodynamic processes.

Course Content:

Unit I: Systems of particles and Rotational motion-II (10 Hours)

Equilibrium of rigid body, centre of gravity, Moment of inertia and kinetic energy of a rotating rigid body, Formulae for moment of inertia of different rigid bodies of regular shape, Perpendicular and parallel axis theorem, kinematics of rotational motion about a fixed axis, work done by a torque, Angular momentum of a rigid body rotating about a fixed axis, conservation of angular momentum.

Unit II: Gravitation (12 Hours)

Kepler's laws, Universal law of gravitation, Gravitational constant, Acceleration due to gravity of the earth, Acceleration due to gravity below and above the surface of the earth, Gravitational potential energy, Escape speed, Earth satellites, Energy of an orbiting satellite.

Unit III: Mechanical properties of solids (08 Hours)

Stress and Strain, Hooke's law, Stress- Strain curve, Young's modulus, Determination of young's modulus of the material of a wire, Shear modulus, Bulk modulus, Elastic potential energy in a stretched wire.

Unit IV: Mechanical Properties of Fluids (12 Hours)

Concept of Pressure, Pascal's law, Variation of pressure with depth, Atmospheric pressure and Gauge pressure, Hydraulic machines, Archimedes principle, Streamline flow, Continuity equation, Bernoulli's Principle, Torricelli's law, Venturi meter, Dynamic lift, (Ball moving without spin, Ball moving with spin, Aerofoil or lift on aircraft wing), Viscosity, Surface tension: Surface energy, Surface energy and surface tension, Angle of contact, Capillary rise.

Unit V: Thermal properties of matter (12 Hours)

Temperature and Heat, Measurement of temperature (Different scales of temperature), Ideal gas equation, Thermal expansion (Linear, areal, volume expansion of solids), Anomalous expansion of water, expansion of gases, specific heat capacity, heat capacity, Calorimetry, change of state, latent heat, Heat transfer: conduction, Convection (convection cycles), Radiation: Black body radiation, Radiation laws, Newton's law of cooling.

Unit VI: Thermodynamics (12 Hours)

Thermal equilibrium, Zeroth law of thermodynamics, Heat, Internal energy and work, First law of thermodynamics, molar specific heat capacity at constant pressure and constant volume, Different types of thermodynamic process, work done in isothermal process, work done in adiabatic process, Heat engine, Refrigerators and Heat pump, Second law of thermodynamics, Reversible and Irreversible process, Carnot engine.

Learning Resources:

Text book:

1."*Physics Part-II, Text Book for Class XI* "National Council of Educational Research and Training (2006).

Reference Books:

1. *"University Physics"*, Sear‟s and Zemansky, Pearson Edition.
2. "*Fundamentals of Physics",* D. Halliday, R. Resnick and J. Walker , *6th Edition,* John Wiley and Sons, New York (2001).
3. "Concept of Physics part-1‟, HC Verma, 2017 Edition

Web Resources:

1. RGUKT course content
2. NPTEL physics: IIT-PAL
   URL: https://www.youtube.com/channel/UCwNr8peMxn8-Nc2V_RZsRvg/videos
3. Ashish Arora, Physicsgalaxy video lectures, 2015
   URL: https://www.youtube.com/user/physicsgalaxy74

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand the concept of centre of mass and centre of gravity of a body. Students will be able to understand the Concept of Rotational Dynamics and equations of motion for rotating body and the analogy between Kinematics and Rotational Dynamics.
CO 2	Understand concept of gravitational force between two bodies and its conservative nature. Students will be able to understand the concept of variation of acceleration due to gravity with height and depth.
CO 3	Understand Practicality of different types of Elastic moduli and Relation between stress and strain.
CO 4	Learners will be able to understand Practicality of Fluid dynamics in real life (Pascal‟s Law, Bernoulli‟s theorem, Magnus Effect) Learners will be able to understand concept of surface Tension and Surfaceenergy and will be able to relate it with a daily life.
CO 5	Understand the Different methods of heat transfer, Concept of thermal expansion and Laws of cooling.
CO 6	Understand the Concept of Heat, work and Internal energy of the system. Learners will be able to understand the thermodynamic process like isothermal, adiabatic, isochoric, isobaric, heat engines etc

Assessment Method:

Course Nature :Theory			
Assessment Tool	**Monthly tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY1210	Physics Lab –II	I Year & II Semester	0-0-2	1

Course Learning Objectives:

The student will gain practical knowledge on verifying the equation of kinemics in two dimensions and well then mechanical properties of fluids. In addition, student will gain practical knowledge on fundamental laws in waves and oscillations in a periodic motion.

1. Students will learn how to verify the different laws in kinematics and dynamics of physics such as acceleration due to gravity on an inclined plane, moment of inertia of fly wheel, spring constant, Young‟s modulus etc.
2. Students will learn how to measure the mechanical properties of fluids such as viscosity of water, surface tension of water etc.
3. Students will learn how to verify the first law in gases i.e., Boyle‟s Law.
4. Students will learn how to verify the laws of transverse waves by using sonometer and the speed of sound in air by using resonance method.

Course Content:

Details of the Experiments:

1. Determine Surface Tension of water by capillary rise method.
2. Verification of the laws of transverse waves using Sonometer.
3. Verification of Boyle‟s Law by Quill tube method.
4. Determination of acceleration due to gravity (g) at a place by using simple pendulum.
5. Determining the Spring Constant of given spring.
6. Determination of moment of inertia of Fly Wheel.
7. Determination of Young‟s modulus of elasticity of the material of a given wire
8. Determination of speed of sound in air by using resonance phenomenon.
9. Determination of viscosity of water measurement

Web resources:

1. URL: http://www.olabs.edu.in/?pg=topMenu&id=40

Course Outcome:

1. Students can understand how to verify the different laws of mechanics such as acceleration due to gravity, inclined plane, moment of inertia fly wheel, spring constant, young‟s modulus etc.
2. Students can understand how to measure the different types of fluids properties such as viscosity of water, surface tension of water etc.
3. Students can understand how to verify laws of thermodynamics such as Boyle‟s Law.
4. Students can understand how to verify the laws of transverse waves by using sonometer and the speed of sound in air by using resonance method.

Assessment Method:

Course Nature		**Practical**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

Course code	Course name	Year & Semester	L-T-P	Credits
23PCY1201	Chemistry - II	I Year & II Semester	4– 2– 0	4

Course Learning Objectives:

1. To know the fundamentals terms in thermodynamics and thermodynamic laws.
2. To analyze the factors effecting position of equilibrium.
3. To know the classification of acids and bases, buffers and solubility of sparingly soluble Salts.
4. To understand the nomenclature, isomerism, types of organic reactions.
5. To know the preparation and properties of alkanes, alkenes and alkynes.
6. To know the preparation and properties of benzene and aromatic compounds.

Course Content:

UNIT-I: Thermodynamics (12 Hours)

Introduction to thermodynamics, Energy and surroundings, extensive and intensive properties, First law of thermodynamics, Enthalpy, enthalpies of reaction, Heat capacity and specific heat. Hess‟s law – calculation of enthalpies of reaction using enthalpies, Spontaneous process, Entropy and Second law of thermodynamics, Gibbs free energy and equilibrium constant.

UNIT-II: Chemical Equilibrium (08 Hours)

Concept of Equilibrium, Law of mass action, equilibrium constant-its characteristics, calculating equilibrium constants. Applications of equilibrium constant (K_c), predicting the direction of reaction (K_c Vs Q). Le Chatelier‟s principle-its industrial applications in the synthesis of ammonia by Haber‟s process and sulfur trioxide by contact process.

UNIT-III: Acids and Bases (10 Hours)

Theories of Acids & bases- Arrhenius theory, Bronsted-Lowry theory, Conjugate acid-base concept, Lewis concept. Ionic equilibrium- ionic product of water, concept of pH, salt hydrolysis (concept and equation only), buffer solutions-definition, action of buffer, pH of buffer solutions (using Henderson equation), solubility product, common ion effect - its applications.

UNIT-IV: Introduction to Organic Chemistry (10 Hours)

Introduction to Organic chemistry, classification and IUPAC nomenclature of organic compounds. Isomerism in organic compounds (structural and stereoisomerism), fission of covalent bond, Types of reagents and organic reactions (addition, substitution, elimination and rearrangement reactions), electronic displacements in covalent bonds-inductive effect, electromeric effect, mesomeric or resonance effect and Hyperconjugation.

UNIT-V: Chemistry of alkanes, alkenes and alkynes (12 Hours)

Alkanes - Nomenclature, preparation of alkanes from alkenes, Wurtz reaction, Clemmenson reduction, Kolbe reaction, from Grignard reagent. Physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis.

Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, methods of preparation (from alkynes, alkylhalides, vicinal dihalides and alcohols). Physical properties, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markownikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition.

Alkynes - Nomenclature, structure of triple bond (ethyne), methods of preparation (from geminaland vicinal dihalides), physical properties, chemical reactions: acidic character of alkynes, addition reaction of hydrogen, halogens, hydrogen halides and water.

UNIT-VI: Benzene and Aromatic hydrocarbons **(08 Hours)**

Aromatic Hydrocarbons: Introduction, structure of benzene, Huckel‟s rule, and preparation methods of benzene. Chemical properties: general mechanism of electrophilic substitution. Nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, reactivity and directive influence of functional group in mono-substituted benzene.

Learning Resources:

Text books:

1. *"Chemistry, Text Book for Class XI"*, National Council of Educational Research and Training, 2006
2. *"Chemistry Text Book for Intermediate First year",* Board of Intermediate AP
3. *Advanced Chemistry – Volumes 1 and 2 by Philip Matthews, Paperback, Cambridge University Press*

Reference Books:

1. *Elements of* Physical *Chemistry*,by **Peter Atkins** and **Julio de Paula,** 7th Edition
2. *Organic chemistry, by Morrison Boyd and Bhattacharjee, 7th Edition*
3. *Chemistry-The central science,by Theodore L. Brown, 13th Edition*
4. *Organic chemistry,by Janice Gorzynski Smith, 3rd Edition*
5. *Chemistry: Principles and reactions,* by **Masterton, Hurley and Neth,** 7th Edition

Web resources:

1. RGUKT course content
2. URL: https://swayam.gov.in/chemistry/c/4/science

Course outcomes: At the end of the course, the student will be able to

CO 1	Calculate the enthalpy of reactions, Gibb‟s free energy and determine spontaneity of reaction
CO 2	To know the Le Chatelier‟s principle and its industrial application
CO 3	Calculating the pH, buffer capacity of buffers and solubility product
CO 4	Give the systematic nomenclature of organic compounds
CO 5	Preparation and properties of alkanes, alkenes and, alkynes
CO 6	To know the preparation and properties of benzene & aromatic compounds

Assessment Method:

Course Nature:Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L – T – P	Credits
23PCY1210	Chemistry Lab-II	I Year & II Semester	0 – 0 – 2	1

Course Learning Objectives:

1. To learn how to determine the pH of various unknown sample solutions.
2. To learn how to determine the concentration of a sample by titrimetric methods

Practical Syllabus:

1. Determination of pH of some solutions obtained from fruit juices, solutions of known and varied concentrations of acids, bases and salts using pH paper or universal indicator.
2. Comparing the pH of solutions of strong and weak acid of same concentration.
3. Determination of strength of a given solution of sodium hydroxide by titrating it against standard solution of oxalic acid.
4. Determination of strength of a given solution of strong acid (HCl/H_2SO_4) by titrating it against standard sodium carbonate and NaOH solution.
5. Determination of concentration of $KMnO_4$ solution by titrating it against a standard solution of

   (i) Oxalic acid (ii) Ferrous ammonium sulphate

Text book:

1. *Vogel's Quantitative Chemical Analysis*, 6th Edition.

Course Outcomes:

At the end of the course, the student will be able to estimate the strength of given solution and express in various units.

Assessment Method:

Course Nature		Practical (Lab courses only)		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PTE1201	**తెలుగు** -2	**I Year & II Semester**	**3 -0 - 0**	**3**

Course Learning Objectives:

1. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
2. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
3. రైతు కష్టం, రైతు కుటుంబాల్లో ఉండే జీవన విధానాలను గుర్తించడం.
4. చెడ్డదైన ఆశల వల్ల వచ్చే దుష్పలితాలను గుర్తించడం.
5. పదాలను ఏక పదంగా మర్చినపుడు విభక్తి లోపం వల్ల కలిగే ప్రయోజనం, విభక్తిని పెట్టడం వల్ల వచ్చే అర్థ స్పష్టతను తెలియజేయడం.
6. హాస్య రచనా విధానం ద్వారా వాస్తవాలను వ్యంగ్యాన్ని గుర్తించడం, సమాస ప్రయోజాన్ని తెల్పడం.

Course Content:

UNIT – I: తెలుగుజాతి వివేకం 41-60 పద్యాలు (6మాడ్యూల్స్) (0**7 Hours)**
(తొలగించినవి మినహా పద్యాలు)
UNIT – II: తెలుగుజాతి వివేకం (61–80) 6మాడ్యూల్స్ (0**7 Hours)**
(తొలగించినవి మినహా పద్యాలు)
UNIT –III: కృషీవలుడు (8 మాడ్యూల్స్) (0**8 Hours)**
UNIT – IV: దురాశ (8మాడ్యూల్స్) (10 **Hours)**
UNIT – V: సమాసాలు (4మాడ్యూల్స్) (0**4 Hours)**
ద్వంద్వ, ద్విగు, అవ్యయీభావ, బహువ్రీహి,షష్ఠీ తత్పురుష,విశేషణ పూర్వపద కర్మధారయ, విశేషణ ఉత్తరపద కర్మధారయ, అవధారణ పూర్వపద కర్మధారయ/రూపక (సమాసాల నిర్వచనాలు,కొన్ని ఉదాహరణలు కంటెంట్ తయారు చేసుకోవాలి లేదా ఈ పై పాఠ్యాంశాలలోనివైనా తీసుకోవచ్చు)
UNIT – VI కైలాసదూత ప్రహసనం - చిలకమర్తి 2(మాడ్యూల్స్) (0**4 Hours)**
ఆధారాలు:

1. తెలుగు జాతి వివేకం పుస్తకం
2. కృషీవలుడు ఖండకావ్యం- దువ్వూరి రామిరెడ్డి
3. దురాశ ప్రాచీన పాఠ్యభాగం(పాత పి.యు.సి. కంటెంట్)
4. కైలాస దూత ప్రహసనం(పాత పి.యు.సి. కంటెంట్)
5 ఎం. విశ్వనాథరాజు, 'తెలుగు వ్యాకరణం', నవరత్న బుక్ హౌస్, విజయవాడ, 1998.

Course outcomes:

CO1	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకుంటారు.
CO2	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో తెలుసుకొంటారు.

CO3	రైతు కష్టం, రైతు కుటుంబాల్లో ఉండే జీవన విధానాలను గుర్తిస్తూఅవగతం చేసుకొంటారు.
CO4	చెడ్డదైన ఆశల వల్ల వచ్చే దుష్పలితాలను గుర్తిస్తూవివరించడం ద్వారా తెలుసుకుంటారు.
CO5	పదాలను ఏక పదంగా మార్చినపుడు విభక్తి లోపం వల్ల కలిగే ప్రయోజనం, విభక్తిని పెట్టడం వల్ల వచ్చే అర్థ స్పష్టతను తెలుసుకుంటారు.
CO6	హాస్య రచనా విధానం ద్వారా వాస్తవాలను వ్యంగ్యాన్ని గుర్తించి తెలుసుకుంటారు. సమాస ప్రయోజాన్ని తెల్పడంద్వారా తెలుసుకుంటారు.

Assessment Method:

Course Nature :Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT1201	Open office & LATEX	I Year & II Semester	2-0-0	2

Course Learning Objectives:

1. Student will learn basic concepts of Open office writer, Office calc and Office Impression
2. Student will learn how to Download and install a comprehensive LaTex distribution
3. Create basic types of LaTex documents (article, report, letter, book)
4. Student will learn basic mathematical formulas (inline) and centered and numbered equations (display math) and aligning multi- line equations

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Course Content:

Unit I: Office Writer **(05 Hours)**

Creating, Explaining about all bars, Formatting characters and Paragraphs; Bullets and numbers, Find and replace, Hyper linking. Inserting, images, shapes, audio and video; Mathematical Operations, Formula Insertions, Table. Header and Footer; Correcting Grammar, Auto Correct Options, Protecting files, saving with different extensions and closing;

Unit II: Office Cal c **(06 Hours)**

Create Spreadsheet, Rename a sheet, shortcuts, cells, rows and column operations, Hyperlink, Freezing; Format menu, Mathematical operations: Functions, Protect sheet and workbook, Filter;

Unit III: Office Impress **(04 Hours)**

Introducing Impress, Using Slide Masters, Styles, and Templates, Adding and Formatting Text, Adding and Formatting Pictures; Animation - manual and automatic slide show - hyper linking

Unit IV: Introduction to Latex **(06 Hours)**

Introduction to latex, Advantages of using Latex, Detailed explanation of latex software, Creating first latex document, Basic typesetting commands, font families, sizes and styles, explanation of document class options, Packages and its advantages, Functionality of some important packages (amsmath, geometry, graphix, color, multirow, tikz etc)

Unit IV: Tables and List **(04 Hours)**

Lists and its types(ordered , unordered, nested, definition list), Creating a table, Table formatting option (merging rows, columns, table caption etc), Inserting picture into document, picture formatting options (resize, rotate, alignment etc)

UNIT- VI: **Math equations and explanation of document classes** **(05 Hours)**

Mathematical modes, Typesetting math in LaTex (sum, integral, limit, martices etc), Different document classes - 1.Creating a presentation using beamer, 2.creating a letter, 3.creating a simple book, 4.creating a simple article 5.creating a simple report.

Learning resources

Text book:

1. *CBSE XIth Standard Computer Science Tex book*
2. *LaTex in 24 Hours by Dilip Datta*

Reference Books:

1. http://cbseacademic.nic.in/circullum-2021.html

Web resources:

1. https://www.w3schools.com/html/default.asp
2. https://www.tutorialspoint.com/tex_commands/latex.htm

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand how to create documents using Open Office writer
CO 2	Understand how to work on Open Office Calc
CO 3	Understand how to create Power point document using Open Office Impress
CO 4	Successfully install LaTeX and its related components on a home/personal computer
CO 5	Use LaTeX and various templates acquired from the course to compose Mathematical documents, presentations, and reports;
CO 6	Use the beamer package to create presentations

Assessment Method:

Course Nature:Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT1210	Lab for Open office & LATEXLab	I Year & II Semester	0-0-2	1

Course Learning Objectives:

The objective of this course is to creating documents using Productivity tools including (word processor, spread sheet, presentation) Word, spread sheet Excel, Power Point and LaTeX.

1. Enable to create word document and power point presentation
2. Enable to work on data using excel
3. Enable to create effective document using LaTex

Course Content:

Details of the Experiments:

Open Office Write and LaTex: Features to be covered, Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer,Using Date and Time option in both LaTeX and Word. Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check , Track Changes, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs.

Open Office Calc: Gridlines, Format Cells, Summation, auto fill, Formatting Text Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting, coutif, count, rank, vlookup

OpenOffice Impress and LaTexBeamer: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting –Images, Clip Art, Tables and Charts in both LaTeX and Powerpoint Concentrating on the in and out of power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes: - Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, DesignTemplates, Hidden slides.

Web resources:

1. http://www.tutorialsforopenoffice.org/

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand how to create documents using Open Office writer
CO 2	Understand how to work on Open Office Calc
CO 3	Understand how to create Power point document using Open Office Impress
CO 4	Successfully install LaTeX and its related components on a home/personal computer
CO 5	Use LaTeX and various templates acquired from the course to compose Mathematical documents, presentations, and reports;
CO 6	Use the beamer package to create presentations

Assessment Method:

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE1201	Biology-II (MBiPC)	I Year & II Semester	3-0-0	3

Course learning objectives:

1. Students will learn about the structural organization in plants and animals.
2. Conceptualize the various modes of reproduction.
3. Students will identify the components of transport system in plants.
4. Students will study about the different component taking part in photosynthesis.
5. To understand the process of respiration in plants.
6. Students will study about plant growth and their development.

Course Content:

UNIT-I **(05 Hours)**

Structural Organisation In Plants And Animals

Anatomy of Flowering Plants: The Tissues (Meristematic and Permanent Tissues) Tissue Systems (Epidermal, Ground and Vascular); and their Secondary Growth

UNIT-II **(09 Hours)**

Reproduction in Organisms: Modes of Reproduction-Asexual and Sexual types

Sexual Reproduction in Flowering Plants: Flower Structure; Development of Male and Female Gametophytes; Pollination–Types, Agents and examples; Pollen-Pistil Interaction; Double Fertilization; Post Fertilization Events-Development of Endosperm and Embryo, Development of Seed and Formation of Fruit; Special Modes– Apomixis, Parthenocarpy, Polyembryony; Significance of Seed and Fruit Formation.

UNIT-III **(09 Hours)**

Plant Physiology

Transport in Plants:Means of Transport: Diffusion, Facilitated Diffusion, Active Transport;

Plant-Water Relations: Water Potential, Osmosis, Plasmolysis, Imbibition; Modes of transport (Apoplast, Symplast)

Mineral Nutrition: Mineral Nutrition, Macro and Micronutrients and their Role; Deficiency Symptoms; Nitrogen Metabolism-Nitrogen Cycle.

UNIT-IV **(09 Hours)**

Photosynthesis in Higher Plants: Early Experiments, Ultra structure of chloroplast, Pigment Systems, Cyclic and Non Cyclic Photophosphorylation; C3 Pathway (The Calvin Cycle), C4 Pathway (Hatch Slack Cycle), CAM, Photorespiration; factors Affecting Photosynthesis.

UNIT- V **(07 Hours)**

Respiration in Plants: Exchange of Gases; Anaerobic Respiration; Aerobic Respiration-Glycolysis, TCA Cycle and Electron Transport System; Oxidative Phosphorylation; the Respiratory Balance Sheet.

UNIT-VI **(06 Hours)**

Plant Growth and Development: Seed Germination; Plant Growth Regulators–Auxin, Gibberellin, Cytokinin, Ethylene, ABA; Seed Dormancy; Photoperiodism; Vernalisation.

Learning resources

Text book:

1. NCERT (Biology I) and Telugu Academy (Zoology and Botany)
2. Plant Physiology Book by Eliezer (Eduardo) Zeiger and Lincoln Taiz published by Sinauer Associates Inc.,U.S
3. Plant Physiology Book by Cleon W. Ross and Frank B. Salisbury published by Wadsworth Publishing Company, 1985

Reference Books:

1. Principles of Biochemistry Book by Albert L. Lehninger, David L. Nelson, and Michael M.Cox published by W. H. Freeman

Web resources:

1. RGUKT course content
2. www.khanacademy.org
3. http://epgp.inflibnet.ac.in/

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand the about the tissues, Tissue and their Secondary Growth
CO 2	Understand about the different modes of reproduction-asexual and sexual types.
CO 3	Gain the knowledge about the mineral, water and different mode of transportation.
CO 4	Understand about the photosynthesis and factors affecting photosynthesis.
CO 5	Understand the different modes of respirations.
CO 6	Understand the process of plant growth and development and different growth factors.

Assessment Method

Course Nature	**Theory**		
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE1202	Elementary Biology **(MPC)**	**I Year & II Semester**	**2-0-0**	**2**

Course Learning Objectives:

1. To enable the students to understand diversity in the living world so that students can know the different categories of living organisms.
2. Students will learn about the cell, various organelles and their functioning.
3. Students will explore the cell division and how the cell will regulate.
4. Students would study microorganisms like bacteria, virus and their useful and harmful aspects.
5. Students learn the plants physiological processes like photosynthesis and respiration.
6. Students will learn about the pollution aspects like air, water and soil pollution along with green house and ozone depletion aspects.

Course content:

UNIT 1 – DIVERSITY AND LIVING WORLD (5 hours)

Branches of biology, Five kingdom classification, Advantages and disadvantages of five Kingdom classification, Eichler's Classification of plant kingdom, Animal Kingdom - Basis of classification, Classification of Animals

UNIT 2 – CELL THE BASIC UNIT OF LIFE (5 hours)

Cell theory, Differences between prokaryotic cell and eukaryotic cell, Cell membrane structure (Fluid mosaic model), Functions of cell membrane, Cell organelles structure and its functions, Mitochondria, Chloroplast, Nucleus, Endoplasmic reticulum, Ribosomes, Golgi complex, Lysosomes

UNIT 3 – CELL CYCLE AND CELL DIVISION (5 hours)

Chromosomes: Structure of chromosomes; types of chromosomes, Cell cycle

M phase, Mitosis; Significance of Mitosis, Meiosis; Significance of Meiosis

UNIT 4 – MICROBIOLOGY (5 hours)

BACTERIA: General characters of bacteria, Structure of bacteria, reproduction in bacteria,

Classification of bacteria based on shapes and flagella, List of bacterial diseases in plants and animals,

VIRUS: General character of viruses. Structure of Tobacco mosaic Virus (TMV), reproduction in viruses, List of viral diseases in plants and animals

UNIT 5 – PLANT PHYSIOLOGY (5 hours)

PHOTOSYNTHESIS: Structure of plastids, pigments and pigments system (PS1and PS 2) Photolysis of water, Cyclic and Non cyclic Photophosphorylation, Calvin cycle (C3 cycle), C4 cycle and CAM pathways.

UNIT 6 – RESPIRATION (5 hours)

Glycolysis, Fermentation, Kreb's cycle, Electron Transport Chain (ETC) – brief account, oxidative phosphorylation

Learning resources

Text book:

1. NCERT (Biology I) and Telugu Academy (Zoology and Botany).
2. G. M. Cooper, '*The Cell: A Molecular Approach Book'* Sunderland (MA): Sinauer Associates, 2000.
3. E. Zeiger and L. Taiz, *'Plant Physiology'* Sinauer Associates Inc.,U.S, 2003.
4. C. W. Ross and F.B. Salisbury, '*Plant Physiology'* Wadsworth Publishing Company, 1985.
5. B.D. Singh, '*Biotechnology.* Kalyani Publishers, 2015.

Reference Books:

1.D. Baltimore and H. Lodish, '*Molecular Cell Biology*' W HFreeman & Co; Fourth Edition edition, 2002.

2.P. S. Verma and V. K. Agarwal, '*Cell Biology, Genetics, Evolution and Ecology*' S. Chand Publishing, 2004.

3.Pelczar, '*Microbiology*' McGraw-Hill Education, 1998.

Web resources:

1. RGUKT course content
2. www.khanacademy.org

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand the principles of classification of plants and animals
CO 2	Understand the difference between prokaryotic and eukaryotic cells and structure and functions of cell organelles.
CO 3	Understand the difference between mitosis and meiosis cell division.
CO 4	Understand the structure of bacteria and virus.
CO 5	Understand about the photosynthesis and factors affecting photosynthesis and understand the different modes of respirations.
CO 6	Understand about the Understand about the issues related to environment

Assessment Method

Course Nature	**Theory**		
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE1210	Biology Lab-II(MBiPC)	I Year & II Semester	0-0-2	1

Course Learning Objectives:

1. To study different parts of a plants.
2. To study the about the Inflorescences.
3. To study the structure of dicot and monocot stem and root.
5. To study about the malvaceae/solanaceae family.
5. To demonstrate the process of osmosis.
6. To know the use of paper chromatography.

Course Content:

Details of the Experiments:

1. Root, stem and leaf modifications.
2. Inflorescences (racemose and cymose types)
3. Dicot and Monocot stem and root T.S (Permanent slides)
4. Description of malvaceae/solanaceae family
5. Demonstration of osmosis using egg membrane/potato osmoscope.
6. Separation of plant pigments by Paper chromatography.

Web resources:

1. http://epgp.inflibnet.ac.in/
2. https://byjus.com/cbse/biology-practical-class-11/

REFERENCES:

1. Ap Biology Investigative Labs: An Inquiry Based Approach

Course Outcome:

1. Students can understand modifications in root, stem and leaf
2. Student will understand the difference between Inflorescences of racemose and cymose types
3. Student will understand the difference between dicot and monocot stem and root
4. Student will be able to know the basic difference between malvaceae/solanaceae family
5. Student will able to know the osmosis using egg membrane.
6. Student will able to learn the separation of plant pigments by using paper chromatography

Assessment Method:

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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PUC–II
SEMESTER-I

Course code	Course name	Year & Semester	L-T-P	Credits
23PEG2101	**English-III**	**II Year & I Semester**	**4-2-0**	**4**

Course learning objectives:

1. To help the student to interpret important issues and to explain them lucidly
2. To train the student how to draw conclusions from discussions
3. To help the student how to evaluate an issue and to assume responsibility while forwarding an opinion
4. To train the student to identify mistakes and errors in a sentence and to correct them
5. To help the student to write an informal letter
6. To guide the student on how to transfer the information across different formats of communication

Course Content:

UNIT-I:

Of Studies – Francis Bacon (Prose); Guided Dialogue Writing; Conversation Practice (1–20) (Study and Communication Skills)

UNIT-II:

On His Having Arrived at the Age of Twenty-Three – John Milton *(Poem)*, Interpretation of Non-Verbal Information – Pie Charts, Tree Diagrams, Tables, Bar Graphs & Flow Charts *(Study and Communication Skills)*

UNIT-III:

In Celebration of Being Alive – Dr. Christian Barnard *(Prose)*, Reading Comprehension (1–15) *(Study and Communication Skills)*

UNIT-IV:

The Tables Turned – William Wordsworth *(Poem)*, Word Stress and Vocabulary Practice *(Study and Communication Skills)*

UNIT-V:

J. C. Bose – Aldous Huxley *(Prose)*, The Last Lesson – Alphonse Daudet *(Prose)*

UNIT-VI:

The Builders – Henry Wadsworth Longfellow *(Poem)*, The Tempest – William Shakespeare (Abridged Version) *(Drama)*

Learning Resources:

Text book:

1. Intermediate 2nd Year English Text Book – Board of Intermediate Education, A.P.
2. Flamingo – NCERT English Textbook (Core Course) for Class XII
3. Archives of RGUKT Content (The Tempest (*An Abridged Version*) – William Shakespeare)

Web Resources:

1. http://www.myenglishgrammar.com/
2. Archives of RGUKT course content (The Tempest_An Abridged Version – William Shakespeare)

Course outcomes: At the end of the course, the student will be able to

CO 1	Analyze and interpret important issues and to explain them lucidly
CO 2	Evaluate an issue and draw conclusions from discussions
CO 3	To assume responsibility while forwarding an opinion
CO 4	Write informal letters
CO 5	Identify mistakes in a sentence and to correct it
CO 6	Transfer the information across different formats of communication

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course Code	Course Name	Year & Semester	L – T - P	Credits
23PMA2101	Mathematics –III	II Year & I Semester	5-2-0	5

Course learning objectives:

1. To study the basic concepts in indefinite integration, Methods to solve the given indefinite integrals and computing the limit of Riemann Sums.
2. To study the definite integrals as a limit of Riemann sum and learn theorems on definite integrals.
3. To study the area between the given curves, volumes of the solids using different methods, length of a plane curve and areas of surfaces.
4. To study the differentiation and integration of Transcendental Functions.
5. To study the permutations and combinations.
6. To study the concepts on Binomial Theorem and Multinomial Theorem.

Course Content:

Unit – I **(10 Hours)**

INDEFINITE INTEGRALS : Indefinite integrals, Integration by substitution, Approximation by finite sums, Average Value of Non-Negative Functions , Algebra of Finite Sums, Limits of Riemann Sums.

Unit – II **(13 Hours)**

DEFINITE INTEGRALS : Definite Integrals ,Properties of Definite Integrals, Area and Integrals, Mean Value Theorem for Integrals , The Fundamental Theorem, Evaluation of Definite Integrals, Substitution in Definite Integrals, Area between the curves.

Unit - III **(12 Hours)**

APPLICATIONS OF INTEGRATION : Volumes of Solids by Slicing, Volumes of Solids of Revolution – Disks, Volumes of Solids of Revolution – Washers, Volumes of Solids of Revolution– Shell Method, Length of Plane Curves, Area of Surfaces of Revolution.

Unit – IV **(20 Hours)**

TRANSCENDENTAL FUNCTIONS : Derivative of Inverse Functions, Natural Logarithms, Logarithmic Differentiation, Exponential Function, General Exponential Function, General Logarithmic Functions, L Hospitals Rule, Relative Rates of Growth, Derivatives of Inverse Trigonometric Functions, Hyperbolic functions, Inverse hyperbolic functions.

Unit - V **(10 Hours)**

PERMUTATIONS AND COMBINATIONS: Fundamental Principle of counting Distributions, Permutations, Permutations with repetitions, ordered samples, Combinations

Unit - VI **(10 Hours)**

BINOMIAL THEOREM: Binomial Theorem for Positive Integral Indices, General and Middle Terms, Greatest Coefficient, Binomial Coefficients, Multinomial Coefficients.

LEARNING RESOURCES:

Text book

1."*CALCULUS OF EARLY TRANSCENDENTALS"*, George B.Thomas, Jr. Maurice D. Weir, Joel Hass, *Thomas,* 12th Edition.

Reference Books

1. "TELUGU ACADEMI MATHEMATICS"- IIA, IIB

2. "NCERT MATHEMATICS" - 11th Grade, 12th Grade (Part-1 and Part-2)

3. "*CALCULUS OF EARLY TRANSCENDENTALS"* by James Stewart 8th Edition.

Web resources

1. RGUKT Course Content

Course outcomes: At the end of the course, the student will be able to

CO 1	Learn the basic concepts in indefinite integration, Methods to solve the given indefinite integrals and computing the limit of Riemann Sums.
CO 2	Learn the definite integrals as a limit of Riemann sum and learn theorems on definite integrals.
CO 3	Learn the area between the given curves, volumes of the solids using different methods, length of a plane curve and areas of surfaces.
CO 4	Learn differentiation and integration of Transcendental Functions.
CO 5	Learn the permutations and combinations.
CO 6	Learn the concepts on Binomial Theorem and Multinomial Theorem.

Assessment Method:

Course Nature :Theory			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY2101	Physics-III	II Year & I Semester	4-2-0	4

Course Learning Objectives:

1. To gain basics on periodic motion and its characteristics as well simple harmonic motion with few examples in real life.
2. Students will learn the wave motion and its classifications in dynamics. In addition, the important terms associated in wave motion and its applications while superposition of waves.
3. Students will learn the origin of electric charges and forces between charges, electric fields associated around charges of different geometries.
4. Students will learn electric potential and potential difference in different geometries. As well, capacitors, combination of capacitors and its working principle in air and dielectric medium.
5. Students will learn flow of electric current by Ohm's law in metal both qualitatively and quantitatively and analysis of currents in circuits by Kirchhoff's laws.
6. Students will learn the magnetic force by moving charges and magnetic field properties associated in different geometric bodies due to moving charges. Magnetism associated due to bar magnetic and classification of magnetic material.

Course Content:

Unit I: Oscillations (12 Hours)

Periodic and Oscillatory motions, Period and frequency, Displacement equation, Simple harmonic motion with graphs, Simple harmonic motion and uniform circular motion, velocity and acceleration in SHM, Force law for simple harmonic motion, Energy in SHM, Applications of SHM: Oscillations due to a spring, Simple pendulum, Damped SHM, Forced oscillations and Resonance.

Unit II: Waves (10 Hours)

Introduction, Transverse and longitudinal waves, Displacement relation in a progressive wave (amplitude, phase, wavelength, Angular wave number, period, angular frequency and frequency),Speed of a travelling wave, Speed of a transverse wave on stretched string, Speed of a longitudinal wave, Principle of superposition of waves, Reflection of waves: Standing waves and Normal modes, Beats, Doppler effect.

Unit III: Electric charges and fields (12 Hours)

Electric charge, Conductors and insulators, Charging by induction, Basic properties of electric change, Coulomb's law, Forces between multiple charges, Electric field, Electric field lines, Electric flux, Electric dipole: Field of an electric dipole, Dipole in a Uniform electric field, Continuous charge distribution, Gauss's law, Applications of Gauss law: Electric field due to an infinitely long straight uniformly charged wire, Infinite plane sheet, thin spherical shell.

Unit IV: Electrostatic potential and capacitance (12 Hours)

Electrostatic potential, Potential due to a point charge, Potential due to an electric dipole, Potential due to a system of charges, Equipotential surfaces: Relation between field and potential, Potential energy of a system of charges, Potential energy in an external field (for a single charge, system of two charges, for a dipole), Electrostatics of conductors, Dielectrics and Polarization, Capacitors and capacitance, Parallel plate capacitor, Effect of dielectric on capacitance, Combination of capacitors in series and in parallel, Energy stored in a capacitor.

Unit V: Current Electricity (12 Hours)

Electric current, Electric current in conductors, Ohm's law, Drift of electrons and the origin of resistivity, Limitations of Ohm's law, Resistivity of various materials, Temperature dependence of

resistivity, Electrical energy and power, Combination of resistors in series and in parallel, Cells, emf, internal resistance, Cells in series and in parallel, kirchhoff's Rules, Wheatstone Bridge, Meter Bridge.

Unit VI: Moving Charges and Magnetism (14 Hours)

Magnetic Force (source and fields, magnetic field, Lorentz force, magnetic force on a current carrying conductor), Motion in a magnetic field, Motion in combined electric and magnetic fields (Velocity selector, Cyclotron), Biot- Savart law(magnetic field due to a current element), Magnetic field on the axis of a circular current loop, Ampere's circuital law, Solenoid and Toroid, Force between two parallel currents, Torque on current loop, magnetic dipole (torque on a rectangular current loop in a uniform magnetic field, Circular current loop as a magnetic dipole, magnetic dipole moment of a revolving electron), Moving coil Galvanometer.

Learning resources

Text book:

1. *Physics Part-I, Text Book for Class XII"*, National Council of Educational Research and Training, 2006

Reference Books:

1. *"University Physics"*, Sear"s and Zemansky, Pearson Edition.
2. *"Fundamentals of Physics",* D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, 6th Edition*,* New York (2001).
3. "Concept of Physics part-1, HC Verma, (2017)

Web resources:

1. RGUKT course content
2. NPTEL physics: IIT-PAL
   URL: https://www.youtube.com/channel/UCwNr8peMxn8-Nc2V_RZsRvg/videos
3. Ashish Arora, Physicsgalaxy video lectures, 2015
   URL: https://www.youtube.com/user/physicsgalaxy74

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand the Mathematical analysis of waves along its basic parameters (Amplitude , Frequency and Phase) Learners will be able to understand the concept of reflection of waves along with concept of harmonics. Learners will be able to understand the Practicality in variation in frequency of sound due to relative motion between source and observer (Doppler"s Effect)
CO 2	Understand the concept of electric charge and distribution of charges. Student will able to calculate electric field due to charge distribution.
CO 3	Understand the concept of electric potential, potential difference and equipotential surfaces. Student will learn concept of capacitors and dielectrics.
CO 4	Learn circuit analysis using Kirchhoff"s laws involving resistors and multiple sources.
CO 5	Understand magnetic field and its production from electric current. Student also learned the calculation of magnetic field using Ampers Law, BiotSavart law for various systems
CO 6	Understand the concept of emf , Faraday"s laws, Lenz"s law and inductance

Assessment Method:

Course Nature :Theory			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY2310	Physics Lab –III	II Year & I Semester	0-0-2	1

Course Learning Objectives:

The student will gain practical knowledge and working procedure on optical devices and well then to know how to determine physical quantities like velocity of sound. In addition, student will gain basic practical knowledge on to verify the fundamental laws in electrostatics such as Ohm‟s law, kirchhoff‟s laws with circuit diagram.

1. Students will learn how to verify the basic fundamental laws in electrostatics such as Ohms law, Kirchhoff's current and voltage law with circuit designing.
2. Students will learn how plotting magnetic field lines around a bar magnetic and finding null points by Equidistance method. In addition, the student will gain basic properties of magnetic lines of forces by observing practical field lines.

Course Content: Details of the Experiments:

1. Determine refractive index of a glass slab or water by using travelling microscope.
2. Verification of Ohm's law by using tangent galvanometer.
3. Verification of ratio of magnetic moments of bar magnets in equidistance method and null method by using Deflection magneto meter.
4. Determination of Specific resistance of given wire using Meter Bridge.
5. Verification of Kirchhoff's Voltage Law.
6. Verification of Kirchhoff's current Law.
7. Draw the magnetic lines of force by placing bar magnet north pole towards geographical north and bar magnet north pole towards geographical south respectively.

Web resources:

1. URL: http://www.olabs.edu.in/?pg=topMenu&id=40

Course outcomes:

At the end of the course, the student will be able to understand how to verify the fundamental laws ofelectricity such as Ohm‟s law, Kirchhoff‟s laws and have a good acquaintance over them.

1. Students can understand how to verify the principles of electrostatics such as Kirchhoff‟s voltage law and Kirchhoff‟s current law, Ohm‟s law, etc.
2. Students can understand how to verify the principles of magnetism such as null method, equidistance method, magnetic fields of lines etc.

Assessment Method:

Course Nature		**Practical**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

Course Code	Course Name	Year & Semester	L – T – P	Credits
23PCY2101	Chemistry – III	II Year & I Semester	4 – 2 – 0	4

Course Learning Objectives:

1. To learn the fundamentals of solids, establish relation between the structure and property of materials
2. To know the laws of electrolysis, application of Nernst equations in various aspects of electrochemistry.
3. To learn the rate of a reaction, molecularity and order of a reaction and concept of activation energy
4. To learn the preparation and properties of alkyl halides and aromatic halides.
5. To know the methods of preparation, properties of alcohols and phenols.
6. To know the general methods of preparation and properties of s- Block elements and group 13,14 elements.

Course content:

UNIT-I: Solid State (10 Hours)

General characteristics of solid state, Amorphous and crystalline solids, Classification of crystalline solids, Crystal lattices and unit cells. Bravais lattices, primitive and centred unit cells, Number of atoms in a unit cell (primitive, body centred (CsCl) and face centred cubic unit cell (NaCl)), Close packed structures: Close packing in one dimension, in two dimensions and in three dimensions-tetrahedral and octahedral voids- formula of a compound. Calculations involving unit cell dimensions, density of the unit cell and packing fraction. X-ray analysis of solids –Braggs' equation, Point defects.

UNIT-II: Electrochemistry (10 Hours)

Electrolytes, non-electrolytes, electrolysis - Faraday‟s laws of electrolysis and application – conductance in electrolytic solutions – Kohlraush‟s law and its applications, electrochemical cell – EMF of the cell, Nernst equation, Type of cells (primary, secondary and fuel cells) – corrosion, rusting of iron, preventing methods of corrosion.

UNIT-III: Chemical Kinetics (10 Hours)

Concept of reaction rate, rate law, units of rate and rate constant – Factors affecting rate of reaction, law of mass action – order and molecularity of a reaction, integrated rate equations and half-life for zero, first and second order reactions, methods of determining reaction order (initial rate method and half-life method), collision theory: concept of activation energy, Arrhenius equation.

UNIT-IV: Haloalkanes and haloarenes (08 Hours)

Haloalkanes and Haloarenes: Introduction, nomenclature, preparation, physical and chemical properties of alkyl halides (substitution and elimination only) & uses of ethyl chloride. Mechanism of Substitution reaction (S_N^1 & S_N^2) Preparation, Chemical properties of haloarenes.

UNIT-V: Alcohols, ethers and phenols (08 Hours)

Alcohols & Phenols: Nomenclature, classification of alcohols, preparation, mechanism of dehydration, physical and chemical properties of alcohols (ethanol), distinguishing primary, secondary and tertiary alcohols using Lucas and Victor Mayer‟s test. Phenols-nomenclature, preparation, properties & uses. Ethers-classification, nomenclature.

UNIT-VI: S -Block and Some P -Block Elements (12 Periods)

Group 1 and Group 2 elements: General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens; uses. Preparation and Properties of sodium hydroxide, biological importance of sodium and potassium, biological importance of Mg and Ca.

General Introduction to p-Block Elements Group 13 elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group; preparation, properties, and structure of diborane.

Group 14 elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first element. Carbon - catenation, allotropic forms [diamond, graphite, C60, graphene, amorphous carbon]. Types of silicates.

Learning Resources:

Text books:

1. *"Chemistry, Text Book for Class XII"*, National Council of Educational Research and Training, 2006

2. *"Chemistry Text Book for Intermediate second year",* Board of Intermediate AP

3. Advanced Chemistry – Volumes 1 and 2 by Philip Matthews, Paperback, Cambridge University Press.

Reference Books:

1. *Elements of* Physical *Chemistry*, by **Peter Atkins** and **Julio de Paula,** 7th Edition.
2. *Organic chemistry, by Morrison Boyd and Bhattacharjee, 7th Edition.*
3. *Chemistry-The central science, by Theodore L. Brown, 13th Edition.*
4. *Organic chemistry,by Janice Gorzynski Smith, 3rd Edition.*
5. *Chemistry: Principles and reactions,by Masterton, Hurley and Neth, 7th Edition.*

Web resources:

1. RGUKT course content.
2. https://swayam.gov.in/chemistry/c/4/science

Course outcomes: At the end of the course, the student will be able to

CO 1	Calculate the crystal parameters establish the relation between the structure and properties of material
CO 2	Estimate the cell potentials of a given cell notation
CO 3	Determine the order of reaction, activation energy and understanding catalysis
CO 4	Predict the chemical reactivity of alkyl halides
CO 5	Predict the chemical reactivity of alcohols and phenols
CO 6	Determine the structure and reactivity of Boron, Carbon and nitrogen family

Assessment Method:

Course Nature :Theory			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course Code	Course Name	Year & Semester	L – T – P	Credits
23PCY2110	Chemistry Lab-III	II Year & I Semester	0 – 0 – 2	1

Course Learning Objectives:

1. To identify the cation and anion present in a given simple salt

Practical Syllabus

1. Inorganic Salt Analysis. (5 salts)

i.Anions - CO_3^{2-}, S^{2-}, SO_4^{2-}, NO_3^-, NO^{2-}, Cl^-, Br^-, I^-, PO_4^{3-}, $C_2O_4^{2-}$, CH_3COO^- .
ii.Cations: Pb^{2+}, Cu^{2+}, Al^{3+}, Fe^{3+}, Zn^{2+}, Ni^{2+}, Ca^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+.

Text books:

1. Vogel's Quantitative Chemical Analysis, 6th Edition.

Course Outcomes:

At the end of the course, the student will be able to identify the functional group present in the given organic compound.

Assessment Method:

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PTE2101	**తెలుగు** -3	**II Year & I Semester**	**3** -0 - **0**	**3**

Course Learning Objectives

1. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
2. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
3. సీతాదేవి హనుమంతుడి సంభాషణ ద్వారా సంభాషణా నైపుణ్యాన్ని పెంచుకోవాలి.
4. మనిషికి ఉండే స్వార్థ చిత్తం శ్మశానంలో ఎలా మారుతుందో తెలియజేయడం.
5. కుటుంబ జీవితంలో కుటుంబ సభ్యులు వారి అనుబంధాలను పెనువేసుకున్న వైఖరిని గుర్తించేలా బోధించడం.
6. పండుగలు, జాతరలు సంస్కృతిని ఆచారాలను ఎలా వ్యక్తీకరిస్తున్నాయో తెలపడం, ఛందస్సు విలువలు తెలపడం.

UNIT – I:తెలుగుజాతి వివేకం81-100 పద్యాలు(5 మాడ్యూల్స్) (0**5 Hours)**
(తొలగించినవి మినహా పద్యాలు)
UNIT –II:తెలుగుజాతి వివేకం 101- 120(5మాడ్యూల్స్) (0**5 Hours)**
(తొలగించినవి మినహా పద్యాలు)
UNIT –III:హనుమత్సందేశం-మొల్ల(8మాడ్యూల్స్) (0**8 Hours)**
(This lesson received by old content)
UNIT – IV : శ్మశానవాటి (4 మాడ్యూల్స్) (0**5 Hours)**
(This lesson received by Inter 1st year text book)
UNIT –V: కలవారి కోడలూ కలికి కామాక్షి (4 మాడ్యూల్స్) (0**5 Hours)**
(This lesson received by Inter 1st year text book)
UNIT – VI:తెలుగు వారి పండుగలు- జాతరులు(7 మాడ్యూల్స్), (0**5 Hours)**
ఛందస్సు (5 మాడ్యూల్స్)
ఛందస్సులో ఉత్పల మాల, చంపక మాల, శార్దూలం, మత్తేభం, తేటగీతి, ఆటవెలది, కందం, సీసపద్యాలు ఉంటాయి. వీటికి కంటెంట్ ఉదాహరణలు రీడింగ్ మెటీరీయల్ తయారు చేయాలి.

మన పండుగలు పాఠాన్ని "తెలుగు వారి పండగలు-జాతరలు"గా పేరును మార్చి క్రిస్మస్, రంజాన్, పండగలను తీసి జాతరలను పెట్టాలని సూచించారు. తెలుగు వారి పండుగలులో పండుగ నిర్వచనం, ఉగాది, ఏరువాక పున్నమి, రాఖీపూర్ణిమ, విజయ దశమి, దీపావళి, భోగి-మకరసంక్రాంతి. జాతరలో- నిర్వచనం, విజయనగరం పైడితల్లి అమ్మవారి సిరిమానోత్సవం, గంగమ్మజాతర. కొత్తగా పెట్టాలని సూచించిన పాఠాలకు ఆచార్యులచే పాఠాలను తయారుచేయించి ఇవ్వవలసినదని చెప్పారు. లేని పక్షంలో ముందు చెప్పిన పాఠాలనే కొనసాగించాలన్నారు.

ఆధారాలు:

1. తెలుగు జాతి వివేకం పుస్తకం
2. మొల్ల రామాయణం పాత పి.యు.సి. కంటెంట్)
3. ఇంటర్ రెండవ సంవత్సరం పాఠ్యగ్రంథం
4. తెలుగు వ్యాకరణం
5. వివిధ తెలుగు వారి పండుగలు

Course outcomes:

CO1	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకుంటారు.
CO2	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో తెలుసుకొంటారు.
CO3	సీతాదేవి హనుమంతుడి సంభాషణ ద్వారా సంభాషణా నైపుణ్యాన్ని అవగతం చేసుకొంటారు.
CO4	మనిషికి ఉండే స్వార్థ చిత్తం శ్మశానంలో ఎలా మారుతుందో వివరించడం ద్వారా తెలుసుకుంటారు.
CO5	కుటుంబ జీవితంలో కుటుంబ సభ్యులు వారి అనుబంధాలను పెనువేసుకున్న వైఖరిని గుర్తించేలా బోధించడం ద్వారా స్పష్టంగా తెలుసుకుంటారు.
CO6	పండుగలు, జాతరలు సంస్కృతిని ఆచారాలను ఎలా వ్యక్తీకరిస్తున్నాయో తెలపడం ద్వారాతెలుసుకుంటారు. ఛందస్సు విలువలు తెలపడంద్వారా తెలుసుకోవాలి.

Assessment Method:

Course Nature :Theory			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT2101	Web designing with HTML, CSS, and Introduction to Programming	II Year & I Semester	2-0-0	2

Course Learning Objectives:

1. Student will learn different tags, elements for creating web pages.
2. Student will learn how to apply effective web design principles
3. Students will learn how to insert text formatting, color, graphics, images, and multimedia for webpages.
4. Student will learn basics on JavaScripts.
5. Student will learn about basic programming with algorithms and flowcharts.

Course Content:

Unit I: Introduction to HTML (05 Hours)

Overview of HTML, Elements, Basic tags, Formatting tags, attributes, bgcolor, color codes, hyperlinks, imagelinks, background, special tags of Multimedia.

Unit II: HTML Components (04 Hours)

Lists (Ordered, Unordered and Definition lists), Tables (<table>, <th>, <tr>, <td>, <caption>, <thead>, <tbody>, <tfoot>, <colgroup>, <col>)

Unit III: Forms (05 Hours)

(<input>, <textarea>, <button>, <select>, <label>), Frames – Attributes Using, Iframe as the Target

Unit IV: Introduction to CSS (05 Hours)

Introduction to CSS, CSS Basics, CSS SELECTORS, Font properties, Various types of styles sheets, Formatting text, fonts, colours and Background, Exploring CSS class and ID attributes

Unit V: Introduction to JS (05 Hours)

What is JavaScript and how to use it, The benefits of JavaScript, Interactivity in HTML, Introducing basic effects into web page

UNIT- VI: Basics of Algorithms and Flow charts (06 Hours)

Introduction to Problem solving and algorithms: Qualities of good algorithms, Advantages and Disadvantages of Algorithm, Properties and efficiency of an algorithm and Tracing of an algorithm, Types of Control Structures and Nested Control Structures in Algorithms Symbols Used in Flowchart, General Rules of flowcharting, Advantages and Disadvantages and Examples of Flowcharts in programming, Types of Control Structures and Nested Control Structures in Flowcharts, Difference between Algorithm, Flowchart and Pseudo code

Learning resources

Text book:

1. *CBSE XIth Standard Computer Science Text book*

Reference Books:

1. Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, And AJAX, Black Book, KOGENT LEARNING SOLUTIONS INC

Web resources:

1. RGUKT course content
2. http://cbse.nic.in/ePub/webcbse/webcbse/Computer%20Science%20%20(Class-XI)/index.html
3. https://www.w3schools.com/html/
4. https://www.guru99.com/php-tutorials.html

Course outcomes: At the end of the course, the student will be able to

CO 1	Recognize and understand HTML web page elements, Understand and apply effective web design principles
CO 2	Enhance web pages using text formatting, color, graphics, images, and multimedia
CO 3	Perform solve problem through algorithm and flowchart
CO 4	Understand the algorithms using tracing methods
CO 5	Understand the conditional and Loop constructions
CO 6	Installation python software and running programs in python tool.

Assessment Method:

Course Nature :Theory			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT2110	Web deigning using HTML and CSS Lab	II Year & I Semester	0-0-2	1

Course Learning Objectives:

The objective of this course is to learn creating web pages using HTML and CSS.

1. Enable to create web pages using HTML and CSS

Course Content:

Details of the Experiments

1. Basic program of html, inserting formatting tags for text: bold, italic, underline, line break, special character, predefine headings, paragraph, comments use font color, size, background and alignment create ordered and unordered list
2. create tables basic structure, using td, tr, th tags, use of basic elements in table : border, cellpadding, cellspacing, width, caption, align, bgcolor working with images in web page:
3. Inserting and formatting of images using src, border, vspace, hspace, align, alt, height, width and background.
4. Creating web pages on linking two or more web pages, linking within a web page, linking to external page, linking to a specific point in another web page, linking image file, mailto.
5. Working with video and sound file.
6. Creating WebPages using css styles and applying same format with different objects.

Web resources:

1. https://www.w3schools.com/html/
2. https://www.tutorialspoint.com/html/index.htm

Course Outcome:

1. Understand how write html code to create webpages
2. Understand how to write CSS codes
3. Understand how to link to another pages
4. Understand different basic level of HTML tags to create web pages.

Assessment Method

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE2101	Biology-III(MBiPC)	II Year & I Semester	3-0-0	3

Course learning objectives:

1. Students will learn about the digestion and absorption process in humans.
2. Students will learn about the respiratory System in humans and mechanism of breathing in Human.
3. Students will learn about the human circulatory system.
4. Identify nerve cell and its functions and interpret the need of chemical coordination
5. Students will learn about human excretory system and human reproduction.
6. Students will understand about the evolution and origin of life.

Course Content:

UNIT-I **(08 Hours)**

Human Physiology

Digestion and Absorption: Alimentary canal and Digestive Glands; Role of Digestive Enzymes and Gastrointestinal Hormones; Peristalsis, Digestion, Absorption and Assimilation of Proteins, Carbohydrates and Fats; Nutritional and Digestive Disorders, Indigestion, Constipation, Vomiting, Jaundice, Diarrhea.

UNIT-II **(08 Hours)**

Breathing and Exchange of Gases: Respiratory Organs in Animals; Respiratory System in Humans; Mechanism of Breathing in Human- Exchange and Transport of Gases; Disorders Related to Respiration- Asthma, Emphysema, Occupational Respiratory Disorders.

UNIT-III **(08 Hours)**

Body Fluids and Circulation: Human Circulatory System-Structure of Human Heart and Blood Vessels; Cardiac Cycle, Cardiac Output, ECG; Double Circulation; Disorders of Circulatory System-Hypertension, Coronary Artery Disease, Angina Pectoris, Heart Failure.

Locomotion and Movement: Muscular; Skeletal Muscle- Contractile Proteins and Muscle Contraction; Skeletal System and Its Functions; Disorders of Muscular and Skeletal System-Myasthenia Gravis, Tetany, Muscular Dystrophy, Arthritis, Osteoporosis, Gout.

UNIT-IV **(08 Hours)**

Neural Control and Coordination: Neuron And Nerves; Nervous System in Humans– Central Nervous System, Peripheral Nervous System and Visceral Nervous System; Generation and Conduction of Nerve Impulse; Reflex Action; Sense organs – Eye and ear

Chemical Coordination and Integration: Endocrine Glands and Hormones; Human Endocrine System; Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Thymus, Adrenal, Pancreas, kidney, heart, Gonads (Testis, Ovary)

UNIT-V **(07 Hours)**

Excretory Products and Their Elimination: Human Excretory System ;Modes of Excretion-Ammonotelism, Ureotelism, Uricotelism; Human Excretory System–Structure and Function; Urine Formation, Osmoregulation; Disorders-Uremia, Renal Failure, Renal Calculi, Nephritis; Dialysis and Artificial Kidney.

Human Reproduction: Male and Female Reproductive Systems; Microscopic Anatomy of Testis and Ovary; Gametogenesis-Spermatogenesis and Oogenesis; Menstrual Cycle; Fertilisation, Embryo Development Upto Blastocyst Formation, Implantation; Pregnancy and Embryonic Development; Placenta Formation; Parturition; Lactation.

UNIT-VI **(06 Hours)**

Evolution:

Origin of Life, Evolution of Life Forms, Evidences for Evolution (Paleontological, Comparative and anatomical evidences); Modern Synthetic Theory of Evolution; Mechanism of Evolution--Variation (Mutation and Recombination) and Natural Selection, Gene Flow and Genetic Drift;

Course learning resources:

Text book:

1. NCERT (Biology II) and Telugu Academy (Zoology and Botany)
2. Organic Evolution -Dr. Veer Bala Rastogi published by Scientific International Pvt. Ltd.

Reference Books:

1. Textbook of Medical Physiology by Guyton published by Saunders;

Web resources:

1. RGUKT course content
2. www.khanacademy.org

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand the about digestive system of human and absorption of nutrients in human intestine.
CO 2	Understand about the exchange and transport of Gases and disorders related to respiration.
CO 3	Understand about the structure circulatory system and disorder of circulatory system.
CO 4	Understand about the nervous system in humans and endocrine glands and hormones
CO 5	Understand about the modes of excretion, human excretory system and male and female Reproductive systems
CO 6	Understand about the different theories of evolution; mechanism of evolution.

Assessment Method:

Course Nature :Theory			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage %	40%	60 %	100 %

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE2202	Elementary Biology**(MPC)**	**II Year & II Semester**	**2-0-0**	**2**

Course Learning Objectives:

1. To enable the students to understand the genes and its importance in living organisms.
2. Students will learn about the evolution and evidences in support of them.
3. Students will learn about the various biomolecules of life.
4. Students will explore human physiological aspects like blood vascular system and hormonal secretions.
5. Explore surroundings and the importance of ecology in the daily life.
6. Students will learn how the genetic material can be manipulated for human applications.

Course content:

UNIT 1 – GENETICS (5 hours)

Contrasting characters of Pisum sativum considered by Mendel, Dominant and recessive characters, Test cross and Back Cross, Monohybrid cross and Dihybrid cross, Law of Dominance with an example, Law of Segregation with an example, Law of Independent assortment with an example, Incomplete dominance and codominanance, Mendilian disorders (haemophilia, sickle cell anemia, colour blindness), chromosomal disorder (Klienfeilter's syndrome, Down's syndrome, Turner's symdrome)

UNIT 2 - EVOLUTION (5 hours)

Origin of Life, Theories of evolution (Lamarkism & Darwinism), Evidences of evolution: Homologous organs (Divergent evolution), Analogous organs (Convergent evolution) Embryological evidences, Paleontological evidences, Adaptive Radiation.

UNIT 3 – BIOCHEMISTRY & MOLECULAR BIOLOGY (5 hours)

Classification of Carbohydrates (monosaccharide, oligosaccharide and polysaccharides) Structure of Proteins - Primary, Secondary, Tertiary and Quaternary structures, Structure of DNA and its differences with RNA, Brief account of Replication, Transcription and Translation

UNIT 4 – HUMAN PHYSIOLOGY (5 hours)

Blood vascular system: Components of blood , Myogenic and neurogenic hearts, Structure of human heart, Blood grouping in humans.

Endocrine system:

List of various glands and their secretions, Endocrine disorder and human beings.

UNIT 5– ECOLOGY (5 hours)

Ecosystem structure and functions, Concept of Food chain and food web, Ecological pyramids – types and significance, Biogeochemical cycles – types and importance

Carbon cycle and Nitrogen cycle, Air pollution: Causes, effects and abatement measures of air pollution, Water pollution: Causes, effects and abatement measures of air pollution, Soil pollution: Causes, effects and abatement measures of soil pollution, Global warming, Ozone depletion and Acid rains

UNIT 6 – BIOTECHNOLOGY (5 hours)

Genetic engineering, Tools of Recombinant DNA technology: Restriction enzymes, Vectors, Process of rDNA technology, Biotechnology Applications in Agriculture- Bt- cotton, Biotechnology Applications in Medicine- Human Insulin

Learning Resources

Text book:

1. NCERT (Biology II) and Telugu Academy (Zoology and Botany)
2. D. Freifelder, '*Molecular genetics'* Narosa Publishing House, 1987.
3. J. *Watson,' Molecular Biology of the Gene'*, 7th Edition, Cold Spring HarborLaboratory, Pearson, 2008.
6. E. P. Odum, '*Ecology*'Philadelphia : Saunders, 1971.
7. B.D. Singh, ' *Biotechnology*' Kalyani Publishers, 2015.
8. A.L. Lehninger, David L. Nelson, and M. Cox,' *Principles of Biochemistry'* W. H. Freeman, 2008.

Reference Books:

1. P.K. Gupta, '*Genetics'* Rastogi Publications, 2018.
2. H Lodish, A. Berk, C.A. Kaiser, M. Krieger and A. Bretscherl, ' *Molecular Cell Biology*', 9th edition, Macmillan, 2021.
3. D. Voet, J. G. Voet, C. W. Pratt , *'Fundamentals of Biochemistry: Life at the Molecular Level*' Wiley

Web resources:

1. RGUKT course content
2. www.khanacademy.org

Course Outcomes: At the end of the course, the student will be able to

CO 1	Understand about the law of inheritance and principle of gene transfer and expression in next generations
CO 2	Understand about the origin of life and theories of evolution
CO 3	Understand structure about DNA, RNA, Protein , carbohydrate and lipid and Brief account of Replication, Transcription and Translation
CO 4	Understand blood vascular system and endocrine system
CO 5	Understand about the structure, functions and components of ecosystem and Biogeochemical cycles.
CO 6	Understand about the principles of biotechnology and their tools and processes and understand about the applications of biotechnology in agriculture and medicine

Evaluation pattern for Theory Course Only:

Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

Course Code	Course Name	Year & Semester	L-T-P	Credits
23PBE2110	Biology Lab-III(MBiPC)	II Year & I Semester	0-0-2	1

Course Learning Objectives:

1. Students will identification of blood groups.
2. Students will gain knowledge about human joints
3. Students will study histology slides.
4. Students will gain knowledge about sense organs
5. Students will learn about qualitative/quantitative estimation of simple protein & lipids.

Course Content: Details of the Experiments

1. Identification of Blood Groups
2. Human joints
3. Histology slides epithelium, muscle, blood smear, T.S of liver
4. Demonstration of sense organs – Eye and Ear
5. Qualitative/Quantitative estimation of simple Protein & lipids.

Web resources:

1. RGUKT course content
2 https://byjus.com/cbse/biology-practical-class-12/
3. https://ncert.nic.in/science-laboratory-manual.php

REFERENCES:

1. AP Biology Investigative Labs: An Inquiry Based Approach

Course outcomes: At the end of the course, the student will be able to

CO 1	Students can understand about the identification of blood groups.
CO 2	Student will understand about structure of human joints.
CO 3	Student will understand the difference between histology slides of epithelium, muscle, bloodsmear, T.S of liver.
CO 4	Student will understand sense organs structure of eye and ear
CO 5	Student will able to do find out the concentration of protein & lipids.

Assessment Method:

Course Nature		Practical (Lab courses only)		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

PUC–II
SEMESTER-II

Course code	Course name	Year & Semester	L-T-P	Credits
23PEG2201	English-IV	II Year & II Semester	4-1-0	4

Course Learning Objectives:

1. To enable the students to read fiction with proper accent, pitch, and rhythm
2. To guide the student on high impact reading to engage and inspire a general audience
3. To improve the imaginative powers of the students vis-a-vis reading fiction
4. To infer the moral values embedded in fiction and to correlate them to the nagging issues in our society
5. To enable the student to write their CV and Cover Letter
6. To help the student to write both formal and informal letters

Course Content:

UNIT-I:
The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) – List of Characters & Chapters 1–4

UNIT-II:
The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) – Chapters: 5–8 & Summary

UNIT-III:
The Tiger King – Kalki *(Prose)*, Describing a Process *(Study and Communication Skills)*, The Language of Advertisements – I (1-10) *(Study and Communication Skills)*

UNIT-IV:
Completing a Form *(Study and Communication Skills)*, The Language of Advertisements – II (11-20) *(Study and Communication Skills)*

UNIT-V:
Learning from the West – N.R Narayana Murthy *(Prose)*, Curriculum Vitae *(Study and Communication Skills)*, Letter Writing – Formal and Informal *(Study and Communication Skills)*

UNIT-VI:
Any Woman – Katherine Tynan (Poem), Vocabulary (Study and Communication Skills), Comprehension Passages – The Adventures of Tom Sawyer – Mark Twain (A Non-detailed Text)

Course learning resources:

References:

1. Board of Intermediate Education 2nd Year English Text book
2. http://www.myenglishgrammar.com/ *(Additional Problem Set)*
3. Archives of RGUKT course content (Conditionals)

Course outcomes: At the end of the course, the student will be able to

CO 1	Read fiction with proper accent, pitch, and rhythm
CO 2	Read stories to engage and inspire a general audience

CO 3	Improve their imaginative powers vis-a-vis reading of fiction
CO 4	Infer the moral values embedded in fiction and to correlate them to the nagging issues in our society
CO 5	Write their CV and Cover Letter for interviews
CO 6	Understand the proper usage of functional English

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course Code	Course Name	Year & Semester	L – T - P	Credits
23PMA2201	Mathematics –IV	II Year & II Semester	5-2-0	5

Course Learning Objectives:

1. To study the different types of methods to solve the indefinite and definite integrals.
2. To study the different types of conic sections and their properties.
3. To study the parameterization of plane curve, differentiation and integration of the parameterized curves, graphing of polar curves in a polar coordinates, polar equations of conics, areas, lengths and surface areas of polar curves.
4. To study the basic concepts of Matrices, Algebra of matrices, determinants of matrices, inverse and rank of a matrix, and system of linear equations and their consistency.
5. To study the different types of infinite series.
6. To study the algebra of Vectors

Course Content:

Unit – I: METHODS OF INTEGRATION **(14 Hours)**

Basic integration formulas, Integration by parts, Partial Fractions, General descriptions of the method of partial fractions, Trigonometric substitutions, Integral Tables ,Reduction formulas.

Unit – II: CONIC SECTIONS **(12 Hours)**

Circle, Parabola, Ellipse, Hyperbola, Classifying Conic Sectionsby Eccentricity, Quadratic Equations in two variables.

Unit – III: PARAMETRIZATION & POLAR COORDINATES **(18 Hours)**

Plane curves, Parameterizations of plane curves, Differentiation with parameterization curves , Integration with parameterized curves, Polar Coordinates, Graphing in Polar Coordinates, Polar Equations for Lines and Circles, Polar Equations for Conic Sections, Area in Polar Coordinates, Length and Surface Area in Polar Coordinates.

Unit – IV: MATRICES **(16 Hours)**

Fundamental of matrices, Algebra of Matrices, Special Matrices, Determinant of matrix, Evaluation of determinants by properties, Finding inverse of a Matrix, Rank of a matrix, System of Linear Equations and Consistency.

Unit - V: INFINIE SERIES **(12 Hours)**

Binomial Series, Geometric Series, Arithmetic- Geometric Series, Exponential Number, Exponential Series, Logarithmic Series.

Unit – VI: VECTOR ALGEBRA **(08 Hours)**

Vectors in Plane, Components of Vector, Slopes Tangents and Normals, Vectors in Space(3-D Coordinate System), Vectors in Space, Unit vectors, Distance and Midpoints, Dot Product, Vector Projections, Cross Product, Calculation of Cross products.

Learning resources:

Text book

1. *"CALCULUS OF EARLY TRANSCENDENTALS"*,George B. Thomas, Jr. Maurice D.Weir, Joel Hass, *THOMAS"* 12th Edition.

Reference Books

1. *"TELUGU ACADEMI MATHEMATICS"*- IIA, IIB
2. *"NCERT MATHEMATICS"* - 11th Grade, 12th Grade (Part-1 and Part-2)

Web resources

1. RGUKT Course Content

Course outcomes: At the end of the course, the student will be able to

CO 1	Learn to solve the indefinite and definite integrals using different types of methods.
CO 2	To study the different types of conic sections and their properties.
CO 3	Learn the parameterization of plane curve, differentiation and integration of the parameterized curves, the polar coordinates, graphing of polar curves in a polar plane, polar equations of conics, areas, lengths and surface areas of polar curves.
CO 4	Learn the concepts of Matrices, rank of a matrix and solving the given system of linear equations.
CO 5	Learn the different types of infinite series.
CO 6	Learn the basic concepts vectors algebra.

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY2201	Physics-IV	II Year & II Semester	4-2-0	4

Course Learning Objectives:

1. Students will learn the basic laws of electromagnetic induction and concepts on eddy currents, self and mutual inductance for better understanding the concept of transformers.
2. To gain the basic knowledge on the properties of electromagnetic spectrum.
3. To gain the detail knowledge on the fundamental laws exhibited by light ray in ray optics and construction and working principles of optical instruments such as Microscopes and astronomical telescopes.
4. To gain the detail knowledge on the optical phenomena exhibited by wave nature of light correlated to interference, diffraction and its characteristics of coherent radiations with an example and their application in specific to optical fibers.
5. To gain the basic knowledge the dual nature of matter waves that embraces the origin of quantum mechanics.
6. To gain detail knowledge on the basic semiconductor physics and basic electronic devices fabricated with semiconductors, i.e. diodes, transistors and its working principle and characteristics

Course Content:

Unit I: Electromagnetic Induction & Alternating currents (10 Hours)
Magnetic flux, Faraday's law of Induction, Lenz's law and conservation of energy, Motional emf, Energy Consideration: A quantitative study, Eddy currents, Inductance (mutual inductance, self inductance), AC Generator.

Unit II: Electromagnetic Waves (10 Hours)
Electromagnetic spectrum, Maxwell- Ampere"s law, Maxwell"s equations and Plane Electromagnetic waves, Polarization of waves, Energy of a wave, wave equation.

Unit III: Ray optics and Optical instruments (14 Hours)
Introduction, Reflection of light by spherical mirrors (Sign convention, focal length of spherical mirrors, Mirror equation), Refraction, Total Internal Reflection (technological applications), Refraction at spherical surfaces and Lenses (Refraction at spherical surfaces, Refraction by lenses, combination of thin lenses in contact), Refraction through a prism, Phenomenon of Rainbow, Scattering of light, Optical instruments (Microscope , Telescope).

Unit IV: Wave Optics (12 Hours)
Huygens principle, Coherent and Incoherent addition of waves, Interference of light waves and Young's experiment (condition for bright and dark fringes), Diffraction (single slit, single slit Diffraction), Polarization (only Malus law)

Unit V: Quantum Physics (14 Hours)
Theory of Photoelectric effect, Einstein's photoelectric equation: Energy quantum of radiation, Particle nature of light (photon), Wave nature of matter, Davisson and Germer experiment. Atomic nucleus, Size of the nucleus, Mass – energy and nuclear binding energy (mass- energy, nuclear binding energy), Nuclear force, Radioactivity (law of radioactive decay, Alpha decay, Beta decay, Gamma decay).

Unit VI: Semiconductor Electronics **(14 Hours)**

Introduction, Classification of metals, conductors and semiconductors, Intrinsic semiconductor, Extrinsic semiconductor(p type and n-type), p-n junction: junction formation, Semiconductor Diode (forward bias and reverse bias), Diode as a rectifier, Zener diode and zener diode as voltage regulator, photo diode, LED, Solar cell , Transistor PNP, NPN (CE, CB, CC qualitative analysis)

Learning resources

Web resources:

1. RGUKT course content

Text book:

1."*Physics Part-1, Text Book for Class XI* ", National Council of Educational Research and Training, 2006

Reference Books:

1. *"University Physics"*Sear"s and Zemansky, Pearson Edition.
2. "*Fundamentals of Physics"*, D. Halliday, R. Resnick and J. Walker *6th Edition*, John Wiley and Sons, New York (2001).
3. Concept of Physics part-1, HC Verma, 2017 Edition

Course outcomes: At the end of the course, the student will be able to

CO 1	The student understand the concept of analyzing circuits involving AC source, resistors, capacitors and inductors along with basic concepts of transformers.
CO2	The student understand the unification of Gauss law, faradays law and ampere"s law with correction done by Maxwell and some basic concepts involving electromagnetic waves
CO 3	Understand the concepts of reflection, refraction, dispersion through mirrors, lens by using ray optics
CO 4	The student understand the concepts of wave nature of light like interference, diffraction, polarization
CO 5	Understand the dual nature of matter and interaction of matter with radiation by using photoelectric effect and some basic modern physical concepts like dual nature, uncertainty principle, which is hard to explain by ordinary classical physics
CO 6	Understand the modern electronics concepts of semiconductor, diode and its characteristics, applications in LED"s, solar cells and power regulation. The student also learns the concepts of transistors and its application in amplifiers and logic gates

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PPY2210	Physics Lab –IV	II Year & II Semester	0-0-2	1

Course Learning Objectives:

The student will gain practical knowledge and working procedure on optical devices and well then to know how to determine physical quantities like focal length of lenses, refractive index glass, wavelength of laser light etc.

1. Students will learn how to measure basic optical parameters such as focal length and radius of curvature of lenses, refractive index of glass, wave length of LASER light, etc by using different optical constituents.
2. Student will observe propagation of a real practical LASER light in laboratory and then determines the wavelength of the LASER source with help of diffraction phenomenon.
3. Students will learn how to verify the basic I-V characteristics of semiconductor diodes as well working of p-n-p and n-p-n transistors with different mode of connections.

Course Content:

Details of the Experiments:

1. Determination of focal length of concave mirror by U-V method.
2. Determination of focal length of convex lens by U-V method and Conjugate foci- method.
3. Determine the refractive index of prism by plotting i-d curve.
4. Determine the wavelength of light using laser diffraction phenomenon.
5 Study the P-N Junction Diode characteristics in forward and reverse bias condition.
6. Verification of I-V characteristics of Junction Diode and Determination break down voltage of Zener Diode.
7. Verification of Transistor characteristics.
8. Determination of the band gap of a semiconductor material by using two probe methods.

Web resources:

1.URL: http://www.olabs.edu.in/?pg=topMenu&id=40

Course outcomes:

At the end of the course, the student will be able to understand the methods to measure various physical quantities like velocity of sound, focal length, refractive index, wavelength of laser etc. As well the student can understand how to verify the fundamental laws of electricity such as Ohm‟s law, Kirchhoff‟s laws and have a good acquaintance over them.

1. Students can understand how to measure the different physical quantities like focal length, refractive index, wave length of Light, etc by using different optical components.

2. Student will learn the concept of LASER light and calculates the wavelength of the LASER source using the concept of diffraction.
3. Students can understand how to verify the principles of electrostatics such as Kirchhoff‟s voltage law and Kirchhoff‟s current law, Ohm‟s law,etc.
4. Students can understand how to verify the principles of magnetism such as null method, equidistance method, magnetic fields of lines etc.
5. Students can understand how to verify the different characteristics of semiconductor devices like diodes, transistors, band gap of semiconductors.

Assessment Method:

Course Nature		**Practical**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course Code	Course Name	Year & Semester	L – T – P	Credits
23PCY2201	Chemistry – IV	II Year & II semester	4 – 2 – 0	4

Course Learning Objectives:

1. To know the methods of preparation, properties of aldehydes and ketones.
2. To predict the reactivity of nitrogen containing organic compounds and carboxylic acids.
3. To learn the fundamentals of metallurgical processes in extraction of metal from ore samples
4. To know the types of adsorption, types of colloids and their application in industry.
5. To know the physical trends in transition elements, theories of co-ordination Chemistry and isomerism.
6. To know the fundamentals of polymerization with an emphasis on some selected polymers.

Course Content:

UNIT-I: Aldehydes and ketones **(12 Hours)**

Nomenclature of carbonyl compounds – Preparation of carbonyl compounds from alkenes, alcohols, nitriles and acid chlorides. Chemical properties of carbonyl compounds– Nucleophilic addition reactions with HCN, NaHSO3, alcohol and RMgX. Mechanism of nucleophilic addition, Condensation reactions with amine derivatives, Oxidation reactions for distinguishing aldehydes and ketones (Tollen's and Fehling's test), Haloform reaction, Reduction of aldehydes and ketones. Reactivity of α-hydrogens in aldehydes (Aldol condensation, crossed aldol and Cannizaro reaction only).

UNIT-II: Carboxylic acids and Amines (12 Hours)

Carboxylic acids: Nomenclature, Preparation of carboxylic acids from alcohols, nitriles and Grignard reagent. Physical properties, chemical properties of carboxylic acids: Acidity of carboxylic acids, Esterification (including mechanism), Reaction with thionyl chloride (SOCl2), P2O5, decarboxylation and reduction reactions. Hell-Volhard-Zelinsky reaction (α-halogenation of carboxylic acids).

Amines: Nomenclature, Preparation of amines from alkyl halides, nitro compounds, and nitriles. Hoffmann bromamide degradation and Gabriel Phthalimide synthesis. Physical and chemical properties of amines-basicity of amines, alkylation, acylation, diazotization, carbylamines reaction. Distinguishing amines using Hinsberg reagent (PhSO2Cl). Anilinepreparation, and propert

UNIT-III:d-block elements and coordination compounds (10 Hours)

Introduction to d-block elements, electronic configuration, general trends in properties of first row transition metals-electronic configuration, color, magnetic properties, alloys and complex formation. **Coordination compounds:** Introduction, nomenclature of coordination compounds – Theories of coordination compounds (Werner's theory, Sidgwick's and Valence bond theory only). Isomerism (geometrical and optical isomerism).

UNIT- IV: Surface Chemistry (10 Hours)

Adsorption and absorption: Types and characteristics of physisorption and chemisorption. Factors affecting the adsorption of a gas on solid. Freundlich and Langmuir adsorption isotherms. Applications of adsorption. Colloids- Classification (Based on different criteria) - multi

molecular,macromolecular and associated colloids, properties of colloidal solutions: Tyndal effect, Brownianmovement, electrophoresis, Emulsions and cleansing action of soap

.

UNIT-V: Metallurgy **(08 Hours)**

Occurrence of metals, Concentration of ores - levigation, magnetic separation, froth floatation, leaching, Extraction of crude metal from concentrated ore, conversion to oxide, reduction of oxide to the metal. Extraction of iron, copper and aluminum from their ores, uses of iron, copper and aluminum.

UNIT-VI: Polymers **(08 Hours)**

Classification of Polymers -Classification based on source, structure, mode of polymerization, molecular forces and growth polymerization. Types of polymerization reactions- addition or chain growth polymerization, ionic and free radical polymerization mechanism. Rubber, natural rubber, vulcanisation of rubber, Synthetic rubbers. Preparation of neoprene and buna-N. Molecular mass of polymers. Commercial importance of polymers like polypropene, polystyrene, polyvinyl chloride (PVC), urea-formaldehyde resin, glyptal, bakelite- their monomers, structures and uses.

Learning Resources:

Text books:

1. *"Chemistry, Text Book for Class XII"*, National Council of Educational Research and Training, 2006
2. *"Chemistry Text Book for Intermediate second year",* Board of Intermediate AP

Reference Books:

1. *Elements of Physical Chemistry*,by **Peter Atkins** and **Julio de Paula,**7th Edition.
2. *Organic chemistry,by Morrison Boyd and Bhattacharjee, 7th Edition.*
3. *Concise Inorganic Chemistry,by J.D. Lee, 5th Edition.*
4. *Organic chemistry, by Janice Gorzynski Smith,3rd Edition.*
5. *Polymer science.*by **Vasant R. Gowariker, N. V. Viswanathan**

Web resources:

1. RGUKT course content.
2. https://swayam.gov.in/chemistry/c/4/science

Course outcomes: At the end of the course, the student will be able to

CO 1	Compare the reactivity‟s of aldehydes and ketones
CO 2	Predict the acidity of carboxylic acids and basicity of amines
CO 3	Explain the method of extraction of metals from ore samples
CO 4	Calculation of adsorption isotherms, properties of colloidal solutions etc.

CO 5	To Predict the physical trends of Transition elements and idea about co-ordination chemistry
CO 6	To know the preparation methods of polymers, structure and industrial applications of some polymers.

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course Code	Course Name	Year & Semester	L – T – P	Credits
23PCY2210	Chemistry Lab-IV	II Year & II Semester	0 – 0 – 2	1

Course Learning Objectives:

1. To identify and confirm the functional group present in a given organic compound

2. To learn how to prepare a few organic compounds

Practical Syllabus

1. Test for the Functional Groups Present in Organic Compounds (Periods 10) Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (primary), and carbohydrate groups.

2. Preparation of Organic Compounds (any one of the following compounds)

(a) Acetanilide (b) Aniline yellow or 2-Naphthol aniline dye

References:

1. *Vogel's Quantitative Chemical Analysis*, 6th Edition.

Course Outcomes:

At the end of the course, the student will be able to

1. Identify the cation and anion present in given simple salt.
2. Identify the functional group present in the given organic compound.

Assessment Method:

Course Nature		Practical (Lab courses only)		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PTE2201	**తెలుగు** -4	**II Year & II Semester**	**3-0-0**	3

Course Learning Objectives:

1. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
2. తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకోవాలి.
3. లౌకిక విద్య, పారమార్థిక విద్యల భేదాలను గుర్తించి, పారమార్థిక విద్యా తత్త్వాన్ని వివరించి ధార్మికతను పెంపొందించాలి.
4. కావ్య సౌందర్యాన్ని పెంచడానికి అలంకార ప్రయోగాలు ఎలాంటి అందాన్ని ఇస్తాయో తెలపడం.
5. వివిధ రకాల వ్యాసాలను రాయడంలో సాధన చేయించడం.
6. అనువాద ప్రయోజనాలు, రకాల ద్వారా అనువాదం పట్ల అభిరుచిని పెంచడం

Course Content:

UNIT – I:తెలుగుజాతి వివేకం121-140 పద్యాలు (5 మాడ్యూల్స్) (0**7 Hours)**
UNIT – II: తెలుగుజాతి వివేకం141-160 పద్యాలు(5 మాడ్యూల్స్) (0**7 Hours)**
UNIT – III: ప్రహ్లాదుని విద్య – బమ్మెర పోతన (13 మాడ్యూల్స్) (11 **Hours)**
UNIT –IV: అలంకారాలు (4 మాడ్యూల్స్):
అర్థాలంకారాలు: ఉపమ, ఉత్ప్రేక్ష, స్వభావోక్తి, రూపక, అతిశయోక్తి, అర్థాంతరన్యాస,
శబ్దాలంకారాలు: అనుప్రాస, ఛేక, ముక్తపద, లాట, యమకం, అంత్యానుప్రాస
(లక్షణం చెప్పి, ఉదాహరణలు ఎక్కడవైనా తీసుకొవచ్చు) (0**7 Hours)**
UNIT – V:వ్యాసం వ్యాసాలు (7 మాడ్యూల్స్) (0**7 Hours)**
(This lesson received by old content)
UNIT – VI: అనువాదం (4 మాడ్యూల్స్) (0**4 Hours)**కొన్ని ఉదాహరణలు
(This lesson received by old content)
ఆధారాలు:

1. తెలుగు జాతి వివేకం పుస్తకం
2. పోతన భాగవతం(పాత పి.యు.సి. కంటెంట్)
3. తెలుగు వ్యాకరణం
4. పాత పి.యు.సి. కంటెంట్

Course outcomes:

CO1	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో అన్వయించుకుంటారు.
CO2	తెలుగు జాతి వివేకం పుస్తకంలోని నీతి పద్యాల ద్వారా నీతిని గ్రహించాలి. జీవితంలోకి అవసరమైన సమయాల్లో తెలుసుకొంటారు.
CO3	లౌకిక విద్య, పారమార్థిక విద్యల భేదాలను గుర్తించి, పారమార్థిక విద్యా తత్త్వాన్ని వివరించి ధార్మికతను అవగతం చేసుకొంటారు.
CO4	కావ్య సౌందర్యాన్ని పెంచడానికి అలంకార ప్రయోగాలు ఎలాంటి అందాన్ని

	ఇస్తాయో తెలుసుకుంటారు.
CO5	వివిధ రకాల వ్యాసాలను రాయడంలో సాధన ద్వారా స్పష్టంగా తెలుసుకుంటారు.
CO6	అనువాద ప్రయోజనాలు, రకాల ద్వారా అనువాదం పట్ల అభిరుచిని తెలపడం ద్వారాతెలుసుకుంటారు.

Assessment Method:

Course Nature :Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT2201	Python Programming Language	II Year & II Semester	2-0-0	2

Course Learning Objectives:

1. I/O operations and debugging, calling built- in functions and us redefined functions and modules
2. Student will learn about the control structures.
3. Student will learn string operations and built in functions of string
4. Students can play with in-built data structures like list, tuples and dictionaries
5. Student will learn file operations and how to implement exception handling

Course Content:

Unit I: Introduction to Python programming (05 Hours)

Introduction and classification of the Programming Languages, Interpreter and Compiler, What is Python Programming Language, History (including 1 or 3 versions), Application and Features of Python Programming. Install and Run Python in Windows and Ubuntu, Type of Modes , IDE tools and sample program in Python, Reserved key words, Identifiers ,Variables ,Constants, Statements & Comments, Operators and Operands in Python

Unit II: Data types, I/O, Types of Errors and Control Structures (06 Hours)

Data types, Conversions between data types, Mutable and Immutable types, Input and Output Operations and Formats, Types of Errors in python.

Conditional Control Structures:
– if, if-else, if-elif- else, Nested statements, Single Statement Suites- Compound Boolean Expressions – Nested Conditionals - Multi-way Decision Statements -Conditional Expressions.

Unit III: Loop Control statements and Functions (06 Hours)
While, for, Netsted loops – The Infinite Loop -Using else Statement with Loops - Single Statement Suites - For Loop Iterating by Sequence Index - Using else Statement with Loops
Loop Control Statements: Break Statement - Continue Statement - Pass Statement

Built-In Functions and User defined functions: Introduction to Functions and Modules, Types of functions and modules, Advantages of functions, Import modules, using built – in Functions (math module, random module…etc), creating different types of user–defined functions,

Unit IV: Strings and Lists (05 Hours)
Strings: Introduction to Strings, indexing, accessing characters of string, slice operator, string operations, escape sequence characters, format() method, string built-in functions, to Create a String and String Indexing (Positive or Negative), to access characters in a given string and Slicing Operations with range |Slicing Operator, String Modifications | Updates (To change, delete ,insert ,add, remove, concatenate and repeat),list of all the escape sequence, The format() Method for Formatting Strings
List: Definition and accessing of Lists, Tuple and Dictionaries, Creation and Indexing (Positive and Negative | Key - Values) Modifications | Updates (To change, delete, insert, add, remove, concatenate, repeat) of the Lists, List Comprehensions Nested Lists, Tuple and Dictionary Slicing Operations with range/Slicing Operator, Built – In Methods or Functions in List

Unit V: Tuples and Dictionary **(04 Hours)**

Tuples: What is Tuple, Advantages of Tuples over Lists, Creating a Tuple, Accessing Python Tuple Elements, Indexing of Tuples, Reveres Indexing of Tuples, Slicing Operator of Tuples, Performing Operations in Tuples, Modifying Elements in a Python Tuple, Deleting Python Tuple Elements

Dictionary: Create a Dictionary, Access Items in Dictionary, Operations in Dictionary, Loop Through a Dictionary, Add Items to a Dictionary, Remove Items from a Dictionary and Delete the Whole Dictionary, Common Python Dictionary Methods

UNIT- VI: Exceptions and File Handling **(05 Hours)**

Exception Handling – Except clause - Try? finally clause Introduction to File System in Python, Types of files (text & binary), different File Operations (open, close) and Access Modes (read, write, append), read (), readline ()

Learning resources

Text book:

1. *Course References from CBSE http://cbseacademic.nic.in/curriculum.html Computer Science (New) CLASS-XII Code No. 083*

Reference Books:

2. Python programming using problem solving approach --- REEMA THAREJA
3. Introduction to programming using Python Y.DANIEL LIANG

Web resources:

1. RGUKT course content
2. https://www.python.org/
3. https://www.udacity.com/wiki/cs101
4. https://docs.python.org/3/tutorial/
5. https://www.tutorialspoint.com/python/index.htm

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand all data types and operators with its precedence and conditional statements
CO 2	Choose correct usage of conditional constructions and Loop constructions.
CO 3	Applying string operations and string built in functions
CO 4	Analyzing basic operations of List, Tuple and Dictionary
CO 5	Able to write file programs using python programming
CO 6	Able to use exception handling concepts in python programming

Assessment Method:

Course Nature :Theory			
Assessment Tool	Monthly tests	End Semester Test	Total
Weightage (%)	40%	60%	100%

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Course code	Course name	Year & Semester	L-T-P	Credits
23PIT2210	Python Programming Language Lab	**II Year & II Semester**	**0-0-2**	**1**

Course Learning Objectives:

The objective of this course is to develop logical abilities of students using Python language as a vehicle. Students will be exposed to Python programming language with an emphasis on semantics and problem solving

1. Provide foundation for programming
2. Enable the students to analyze and efficiently solve the problems using Python Programming language

Course Content:
List of Laboratory Experiments:
Following is the list of problems expected to be solved using Python Programming. As this list represents example problems; the problems discussed and given to solve are not restricts only to this

Topic	Programs
Basic Programs and Operators	1. Write a program to display "Welcome to Rajiv Gandhi University of Knowledge Technologies" 2. Write a program to calculate simple interest and compound interest 3. Write a program to calculate electricity-bill for a customer, where unit details are entered through the keyboard. 4. Write a program to compute distance between two points taking input from the user 5. Write a program add.py that takes 2 numbers as command line arguments and prints its sum. 6. Python Program to find the average of three numbers 7. Evaluate the given expression (ax+b) / (ax-b) 8. Python program for swapping of a two numbers using third variable 9. Python program for swapping of a two numbers without using third variable 10. Python program that takes three coefficients (a, b, and c) of a Quadratic equation (ax2+bx+c=0) as input and compute all possible roots
Control Flow	11. Python Program to find largest value from three numbers 12. Write a Program for checking whether the given number is a even number or not. 13. Python Program to find smallest value from three numbers 14. Python Program to Check Whether a Given Year is a Leap Year 15. Python program to check whether a number is Palindrome or not 16. Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4, . . . ,1/10 17. Write a program using a for loop that loops over a sequence. What is sequence? 18. Write a program using a while loop that asks the user for a number, and

	prints a countdown from that number to zero.
Data Structures	19. Python program to check whether a string is Palindrome or not 20. Python program to create list with n elements and find the average 21. Python program to store n elements into a list, find the Average of the list excluding zero elements 22. Python program to create list with n elements and find the largest number without using built-in functions 23. Python program to count the numbers of characters in the string and store them in a dictionary data structure. 24. Python program to create dictionary with key as unique element from Tuple and value as factors of the element 25. Python Program to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are factorial of keys. 26. Python program to create dictionary with key as unique element from Tuple and value as factors of the element
Files	27. Python program to find the longest word from the file 28. Write a program to print each line of a file in reverse order. 29. Python Program to find to calculate digit sum of line by line number from file and store it into another file with number and its digit sum 30. Write a program to compute the number of characters, words and lines in a file.
Functions	31. Python Program to define function with primedigitproduct() to find prime digits product of a given number 32. Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding. Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius If (distance between two balls centers) <= (sum of their radii) then (they are colliding) 33. Find mean, median, mode for the given set of numbers in a list 34. Write a function dups to find all duplicates in the list 35. Write a function unique to find all the unique elements of a list. 36. Write a function cumulative_product to compute cumulative product of a list of numbers. 37. Write a function reverse to reverse a list. Without using the reverse function. 38. Write function to compute gcd, lcm of two numbers

Web resources:

1. https://www.geeksforgeeks.org/python-programming-examples/

Course Outcome: At the end of the course, the student will be able to

CO 1	Practically student can understand all data types and operators with its precedence and conditional statements
CO 2	Choose correct usage of conditional constructions and Loop constructions.
CO 3	Applying string operations and string built in functions
CO 4	Analyzing basic operations of List, Tuple and Dictionary
CO 5	Able to write file programs using python programming
CO 6	Able to use exception handling concepts in python programming

Assessment Method

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE2201	Biology-IV(MBiPC)	II Year & II Semester	3-0-0	3

Course learning objectives:

1. Students will develop the concept of heredity.
2. Students will gain knowledge about the molecular basis of inheritance.
3. Students will study the principles of biotechnology.
4. Students will study the applications of biotechnology.
5. Students will study components in ecosystem and organisms and their interaction in Populations.
6. Students will gain knowledge about biodiversity and its importance.

Course Content:

UNIT- I: Genetics **(09 Hours)**

Principles of Inheritance and Variation: Mendel‟s Law of Inheritance; Monohybrid Cross: Laws of Dominance and Segregation, Incomplete Dominance, Co-Dominance, Multiple Alleles and Inheritance of Blood Groups; Inheritance of Two Genes: Dihybrid Cross, Law of Independent Assortment; Chromosomal Theory of Inheritance; Sex Determination in Humans; Mutations Genetic Disorders (Colour Blindness; Haemophilia, Sickle Cell Anaemia, Kleinfelter‟ssyndrome Turner‟s syndromeand Down‟s syndrome)

UNIT-II: Molecular Basis of Inheritance **(09 Hours)**

DNA as Genetic Material; DNA Structure, Packaging; Properties of DNA and RNA; Central Dogma; DNA Replication; Transcription, Genetic Code, Translation; Gene Expression and Regulation– Lac Operon of prokaryotes.

UNIT-III: **Biotechnology** **(06 Hours)**

Principles and Processes: Principles of Biotechnology: Genetic Engineering; Toolsand Process of Recombinant DNA Technology.

UNIT-IV: Biotechnology and its Applications (Agriculture,Medicine) **(06 Hours)**

Human Insulin and Vaccine Production, Gene Therapy; Genetically Modified Organisms- Bt Crops; Transgenic Animals; Biosafety Issues– Biopiracy and Patents.

UNIT-V: **Ecology** **(08 Hours)**

Organisms and Populations: Habitat and Niche; Population and Ecological Adaptations; Population Interactions-Mutualism, Competition, Predation, Parasitism; Population Attributes Growth, Birth Rate and Death Rate, Age Distribution.

Ecosystem: Structure and Functions, Components; Productivity and Decomposition; Energy Flow; Ecological Pyramids of Number, Biomass, Energy; Ecological Succession;

UNIT-VI **(07 Hours)**

Biodiversity and Conservation: Concept of Biodiversity; Patterns of Biodiversity; Importance of Biodiversity; Loss of Biodiversity; Biodiversity Conservation; Hotspots, Endangered Organisms, Extinction, Red Data Book, Biosphere Reserves, National Parks and Sanctuaries.

Environmental Issues: Greenhouse Effect and Global Warming; Ozone Depletion; Deforestation;

Learning resources

Text book:

1. NCERT (Biology II) and Telugu Academy (Zoology and Botany)
2. Molecular genetics by David Freifelder published by Narosa Publishing House
3. *Molecular* Biology of the Gene, 7th Edition. James D. *Watson*, Cold Spring Harbor Laboratory published by Pearson
5. Ecology- Eugene Odum published by Philadelphia : Saunders
6. Biotechnology by B.D. Singh published by Kalyani Publishers

Reference Books:

1. Genetics by P.K. Gupta published by Rastogi Publications
2. Molecular Biology by G.M.Cooper published by Macmillan

Web resources:

1. RGUKT course content
2. www.khanacademy.org

Course outcomes: At the end of the course, the student will be able to

CO 1	Understand about the law of inheritance and principle of gene transfer and expression in next generations.
CO 2	Understand about the genetic material and gene expression and regulation.
CO 3	Understand about the principles of biotechnology and their tools and processes
CO 4	Understand about the applications of biotechnology in agriculture and medicine
CO 5	Understand about the structure, functions, components of ecosystem and types of population interactions.
CO 6	Understand about the issues related to environment and biodiversity conservation.

Assessment Method:

COURSE NATURE : THEORY			
Assessment Tool	**Monthly Tests**	**End Semester Test**	**Total**
Weightage (%)	40%	60%	100%

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Course Name	Course Code	Year & Semester	L-T-P	Credits
23PBE2210	Biology Lab-IV(MBiPC)	II Year & II Semester	0-0-2	1

Course Learning Objectives:

1. Students will learn to solve the problems on monohybrid cross and dihybrid cross.
2. Students will gain knowledge about extraction of DNA from plant material
3. Students will learn to solve the problems on Hardy Weinberg Law
4. Students will learn to check pH of soil/water samples
5. Students will learn to do pedigree analysis
6. Students will gain knowledge about DNA fingerprinting
7. Students will know process of Gel electrophoresis
8. Students will know about economic values of some plants.
9. Students will know about ecological adaptations in Hydrophyte & xerophyte

Course Content:
Details of the Experiments:

1. Problems on Monohybrid cross and Dihybrid cross
2. Extraction of DNA from plant material
3. Problems on Hardy Weinberg Law (any 2)
4. pH of soil/water samples
5. Pedigree analysis
6. DNA fingerprinting
7. Demonstration of Gel electrophoresis
8. Economic botany
9. Ecological adaptations in Hydrophyte & xerophyte

Web resources:

1. RGUKT course content
2. https://byjus.com/cbse/biology-practical-class-12/
3. https://ncert.nic.in/science-laboratory-manual.php
4. https://www.philoid.com/epub/ncert/12/290/lelm208

REFERENCES:

1. AP Biology Investigative Labs: An Inquiry Based Approach

Course Outcome:

1. Students can understand about the monohybrid cross and dihybrid cross

2. Student will understand about process of DNA extraction from plant material
3. Student will able to solve the problems based on Hardy Weinberg Law
4. Student will able to pH of soil/water samples
5. Student will able to do pedigree analysis
6. Students will gain analyze the DNA fingerprinting
7. Students will able to know detail Biomolecules by Gel electrophoresis
8. Students will gain knowledge about the economic importance of plants and their useful parts(leaf, roots, stems, seeds)
9. Students will about the ecological adaptations stretegies used by hydrophyte & xerophyte

Assessment Method:

Course Nature		**Practical (Lab courses only)**		
Assessment Tool	Experiments	Record	Viva-Voce/ Quiz/MCQ/Lab project	Total
Weightage (%)	25%	5%	10%	40%
End Semester Examination weightage (%)				60%

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