

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 2020-21 Admitted Batch Onwards)

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

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COURSE STRUCTURE

PUC-I SEMESTER-I						
S.NO	Course Code	Name of the Course	No. of Credits	No.of periods per week		
				L	T	P
1	20PEG1101	English-I	3	3	2	0
2	20PMA1101	Mathematics-I	5	5	2	0
3	20PPY1101	Physics-I	4	4	2	0
4	20PPY1110	Physics Lab – I	1	0	0	2
5	20PCY1101	Chemistry – I	4	4	2	0
6	20PCY1110	Chemistry Lab –I	1	0	0	2
7	20PTE1101	Telugu – I	3	3	0	0
8	20PIT1101	Basics in Information Technology	2	2	0	0
9	20PIT1110	Fundamentals of Computer Lab	1	0	0	2
Total			24	21	8	6
OPTIONAL COURSES						
10	20PBE1101	Biology-I	3	3	0	0
11	20PBE1110	Biology Lab-I	1	0	0	2

PUC–I SEMESTER-II

S.NO	Course Code	Name of the Course	No. of Credits	No.of periods per week		
				L	T	P
1	20PEG1201	English-II	3	3	2	0
2	20PMA1201	Mathematics-II	5	5	2	0
3	20PPY1201	Physics-II	4	4	2	0
4	20PPY1210	Physics Lab – II	1	0	0	2
5	20PCY1201	Chemistry – II	4	4	2	0
6	20PCY1210	Chemistry Lab –II	1	0	0	2
7	20PTE1201	Telugu – II	3	3	0	0
8	20PIT1201	Open office & LATEX	2	2	0	0
9	20PIT1210	Open office & LATEX Lab	1	0	0	2
Total			24	21	8	6
OPTIONAL COURSES						
10	20PBE1201	Biology-II	3	3	0	0
11	20PBE1210	Biology Lab-II	1	0	0	2

PUC-II SEMESTER-I

S.NO	Course Code	Name of the Course	No. of Credits	No. of periods per week		
				L	T	P
1	20PEG2101	English-III	3	3	2	0
2	20PMA2101	Mathematics-III	5	5	2	0
3	20PPY2101	Physics-III	4	4	2	0
4	20PPY2110	Physics Lab – III	1	0	0	2
5	20PCY2101	Chemistry – III	4	4	2	0
6	20PCY2110	Chemistry Lab –III	1	0	0	2
7	20PTE2101	Telugu – III	3	3	0	0
8	20PIT2101	Web designing with HTML, CSS, and Introduction to Programming	2	2	0	0
9	20PIT2110	Web deigning using HTML and CSS Lab	1	0	0	2
Total			24	21	8	6
OPTIONAL COURSES						
10	20PB2101	Biology-III	3	3	0	0
11	20PBE2110	Biology Lab-III	1	0	0	2

PUC-II SEMESTER-II

S.No	Course Code	Name of the Course	No. of Credits	No. of periods per week		
				L	T	P
1	20PEG2201	English-IV	3	3	2	0
2	20PMA2201	Mathematics-IV	5	5	2	0
3	20PPY2201	Physics-IV	4	4	2	0
4	20PPY2210	Physics Lab – IV	1	0	0	2
5	20PCY2201	Chemistry – IV	4	4	2	0
6	20PCY2210	Chemistry Lab –IV	1	0	0	2
7	20PTE2201	Telugu – IV	3	3	0	0
8	20PIT2201	Python Programming Language	2	2	0	0
9	20PIT2210	Python Programming Language Lab	1	0	0	2
Total			24	21	8	6
OPTIONAL COURSES						
10	20PBE2201	Biology-IV	3	3	0	0
11	20PBE2210	Biology Lab-IV	1	0	0	2

PUC–I

SEMESTER-I

Course code	Course name	Year & Semester	L-T-P	Credits
20PEG1101	English-I	I Year & I Semester	3-2-0	3

Course Learning Objectives:

To improve the reading skills of the students.

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

Course Content:

UNIT-I: (07 Hours)

Self-Introduction, Introduction to the Syllabus, Exams Pattern, Model Paper - Letter to his Son's Teacher - Abraham Lincoln (Prose) -Parts of Speech -Prepositions

UNIT-II: (05 Hours)

Engine Trouble – R.K. Narayan (Extensive Reading) -Introduction to Speech Sounds – Vowels, Consonants and Diphthongs -Silent Letters

UNIT-III: (07 Hours)

She Conquered the Everest – Compiled by B. Sowjanya (Prose) -Commonwealth of Bees – William Shakespeare (Poem) -Word Power

UNIT-IV: (05 Hours)

The Last Leaf – O. Henry (Extensive Reading) -Time and Tense – Present Tense and Past Tense & Guided Composition -Time and Tense – Future Tense & Guided Composition

UNIT-V: (06 Hours)

The Portrait of a Lady – Kushwant Singh (Prose) -Odd Sounds & The Syllable -Articles

UNIT-VI: (06 Hours)

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

Learning Resources:

Text book:

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

References Book:

1. Phonetics for Indian Students by T. Balasubramanian

Web Resources:

1. <http://www.myenglishgrammar.com/>(Additional Problem Set)
2. Archives of RGUKT (Guided Composition-Tense)

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%

Course Code	Course Name	Year & Semester	L – T – P	Credits
20PMA1101	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 (14 Hours)

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

Unit - II (09 Hours)

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

Unit – III (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 – IV (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-V

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.

Unit – VI (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.

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.

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 %

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY1101	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 the physical 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

(07 Hours)

Introduction to physics, Units and measurements, system of units, fundamental units, measurement of Length, mass and time; derived units, Dimensions of Physical Quantities, Dimensional Analysis and its Applications. Accuracy, Precision of Instruments and errors in measurements.

Unit II: Vectors

(08 Hours)

Scalar and Vector, Types of Vectors, Unit vector, Addition and subtraction of vectors: Triangle law of Vector Addition, Parallelogram law of Vector Addition (with proof), Polygon law of Vectors, Resolution of a vector into Rectangular components. Scalar and vector products with properties and examples, relative velocity (boat problems)

Unit III: Kinematics

(09 Hours)

Frame of reference and Motion in a straight line: Position, displacement, distance, velocity, speed and acceleration; displacement, velocity and acceleration-time graphs, kinematic equations of motion, Free-fall motion. Projectile Motion in a plane: Oblique, Horizontal projectile motion (expressions for maximum height, time of flight and range).

Unit IV: Laws of Motion

(09 Hours)

Concept of force, Newton's laws of motion and its applications by free body diagrams, Equilibrium of concurrent forces, Static, kinetic and rolling friction, laws of friction, derivation of acceleration for horizontal and inclined plane, lubrication, uniform and non-uniform circular motion, Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road (without friction and with friction)).

Unit V: Work, Energy and Power

(07 Hours)

Work done by a constant force and a variable force; kinetic energy, power, work- energy theorem, Conservative and non-conservative forces with examples and properties, Potential energy, potential energy of a spring, Gravitational potential energy, Energy diagrams.

UNIT- VI: Conservation of Energy

(08 Hours)

Conservation of energy and applications- vertical circular motion, Conservation of linear momentum, Impulse, Impulse – momentum theorem, Collisions: elastic and inelastic collisions in one and two dimensions.

Learning Resources:

Text book:

1. 'Physics Part-I, 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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY1110	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%

Course Code	Course Name	Year & Semester	L – T – P	Credits
20PCY1101	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: 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 model. Wave nature of matter, De-Broglie's relationship, Heisenberg uncertainty principle. Introduction to quantum mechanics and atomic orbitals, Quantum numbers, Rules for filling electrons in orbitals (Aufbau, Hund's & Pauli's principle), Electronic configuration of atoms.

UNIT-II: Periodic Classification

(06 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.

UNIT-III: Chemical Bonding

(10 Hours)

Types of chemical bonding-Ionic, Covalent, metallic and co-ordinate covalent bond. 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 , sp^2 , and sp^3 , sp^3d and sp^3d^2 hybrid orbitals. Molecular orbital theory, molecular orbital energy level diagrams of H_2 , C_2 , N_2 , O_2 , O_2^+ , O_2^- , O_2^{2-} , F_2 . Hydrogen bond, and its classification.

UNIT-IV: Gaseous State

(06 Hours)

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

UNIT-V: Stoichiometry

(08 Hours)

Mole concept, the concept of molecular weight and equivalent weight. Percentage composition, calculations of empirical, molecular formulae. Balancing and stoichiometry of equations, Calculation of oxidation number and balancing Redox reactions using oxidation number method and ion-electron method.

UNIT-VI: Solutions

(08 Hours)

Solutions and their properties, percent concentrations (w/w%, w/v% and v/v%), concentration terms-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**, 7th Edition
2. *Concise Inorganic Chemistry*, by **J.D. Lee**, 5th Edition
3. *Chemistry-The central science*, by **Theodore L. Brown**, 13th 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**, 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	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%

Course Code	Course Name	Year & Semester	L – T – P	Credits
20PCY1110	Chemistry Lab-I	I Year & I Semester	0 – 0 – 2	1

Course Learning Objectives:

1. To learn how to prepare few of inorganic and organic compounds

Practical Syllabus:

1. Introduction to Basic Laboratory apparatus: Glasswares, Chemicals, Best lab practices.
2. Chemistry involved in the preparation of double salts like potash alum, potassium ferric oxalate.
3. Preparation of Organic compounds: Acetanilide and p-Nitroacetanilide

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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PTE1101	తెలుగు – 1	I Year & I Semester	3-0-0	3

Course Learning Objectives:

1. భావి భారత పౌరులుగా ఎదుగుతున్నదశలో ఉన్న మన విద్యార్థులు ఈ పద్యాల లోని నీతుల ద్వారా మన సంస్కృతి సంప్రదాయాలను అవగతం చేసుకుంటారు.
2. మనభాషపట్ల కూడా మక్కువ ఏర్పడుతుంది. ఆయా పద్యాలు, సూక్తులలో చెప్పబడిన నీతులు వారికి బంగారు భవిష్యత్తును అందించడమే కాక వారిని ఉత్తమ పౌరులుగా తీర్చి దిద్దగలవు కూడా.
3. యయాతి హితవు పాఠ్యభాగం ద్వారా విద్యార్థిని, విద్యార్థులకు వ్యక్తిత్వ వికాసం, అభివ్యక్తి నైపుణ్యం ఏర్పడుతుంది. ఒక విషయాన్ని ఎంత గొప్పగా వ్యక్తం చేయవచ్చో చెప్పేభావవ్యక్తీకరణ నైపుణ్యం గమనిస్తారు. సాంకేతిక విద్య నభ్యసిస్తున్న మన విద్యార్థులకు స్వభాషలోనే విలువలతో కూడిన విద్యను అందిస్తుంది తెలుగుశాఖ.
4. జయభేరి పాఠ్యభాగం ద్వారా సమాజంలోని హెచ్చుతగ్గులను, అసమానతలను, కార్మికుల, కర్షకుల కష్టనష్టాలను గ్రహిస్తారు. తద్వారా మన సమాజ స్వరూపాన్ని అర్థం చేసుకోవడానికి అవకాశం కలుగుతుంది.
5. ఆంధ్రమహాభారతంలోని వ్యాఘ్రగోమాయు సంవాదం పాఠ్యభాగం ద్వారా మంచివారికి, చెడ్డవారికి మధ్యగల భేదాలను తెలుసుకుంటారు. ఎవరితో స్నేహం చేయాలో, ఎవరికి దూరంగా ఉండాలో తెలుసుకుంటారు. అంపకం పాఠ్యభాగం తండ్రికూతుళ్ల మధ్యగల ప్రేమను, అవ్యక్తానురూపమైన అనురాగాన్ని గ్రహించి తండ్రి ప్రేమను గుర్తించగలుగుతారు.

Course Content:

Unit – I	తెలుగుజాతి వివేకం1-25 పద్యాలు	(05 Hours)
Unit - II	తెలుగుజాతి వివేకం 26 – 40 పద్యాలు	(05 Hours)
Unit - III	యయాతి హితవు – నన్నయ	(10 Hours)
Unit - IV	జయభేరి – శ్రీ శ్రీ	(03 Hours)
Unit - V	వ్యాఘ్రగోమాయు సంవాదం - తిక్కన	(10 Hours)
Unit-VI	అంపకం	(03 Hours)

Learning resources

Text book:

1. తెలుగు జాతి వివేకం (నీతి ధర్మ లోకోక్తులు), సంకలనంఉండేల మాలకొండారెడ్డి.డా., పరిష్కర్తవాచస్పతి -, డాకుసుమారెడ్డి.కె., రాజీవ్ గాంధీ వైజ్ఞానిక సాంకేతిక విశ్వవిద్యాలయం :ప్రచురణ , 2010 (రెండవ ముద్రణ).

Reference Books:

1. శతక పద్య మంజరి – విశాలాంధ్ర పబ్లికేషన్స్
2. తెలుగు సాహిత్య సమీక్ష1-, భాగాలు 2, డాక్టర్ జినాగయ్య ., నవ్య పరిశోధక ప్రచురణలు,తిరుపతి.
3. తెలుగు సాహిత్య చరిత్ర, డాశాస్త్రి .నా.ద్వా ., ప్రగతి పబ్లికేషన్స్, విజయవాడ.
4. ఆంధ్ర మహాభారతం, తిరుమల తిరుపతి దేవస్థానం ప్రచురణలు, తిరుపతి.
5. మహా ప్రస్థానం, శ్రీశ్రీ, విశాలాంధ్ర పబ్లిషింగ్ హౌస్, విజయవాడ .

6. ఆంధ్ర కవుల చరిత్ర-1,2,3 భాగాలు, కందుకూరి వీరేశలింగం పంతులు, అన్ని పుస్తక విక్రయ కేంద్రాలు.
7. సులక్షణ సారము(చందశాస్త్రము), డాబ్జొన్నలగడ్డ మృత్యుంజయ రావు ., రోహిణి పబ్లికేషన్స్, రాజమండ్రి, తృతీయ ముద్రణ,,2007
- 8 తెలుగు వ్యాకరణం, ఎంవిశ్వనాథరాజు ., నవరత్న బుక్ హౌస్, విజయవాడ, 1998.
9. రోజుకో పద్యం, మల్లాది హనుమంతరావు, అన్ని పుస్తక విక్రయ కేంద్రాలు .

Web resources:

1. RGUKT course content

పై పాఠాలకు సంబంధించి డా. రాళ్ళబండి కవితా ప్రసాద్, ఆచార్య డా. కె.కుసుమారెడ్డి, డా. ఉండేల మాలకొండారెడ్డి వంటి ప్రసిద్ధ సాహితీవేత్తల వీడియోలు ఉన్నాయి. వీటికి సంబంధించిన వీడియోలు ఆర్జీయూకేటీ వెబ్ లింక్ లో అందుబాటులో ఉంటాయి.

Course outcomes:

పీయూసీ మొదటి సంవత్సరపు విద్యార్థులు మొదటి సెమిస్టరులో ఈ కింది పాఠ్యాంశాలను నేర్చుకుంటారు.

CO 1	తెలుగుజాతివివేకం పుస్తకంలోని నీతి, విలువలు నేర్చుకొంటారు. సమాజంలో ఎలా జీవించాలి. ఎవరి దగ్గర ఎలా ఉండాలి, ఎలా మాట్లాడాలి, సజ్జనుల గుణగణాలు ఏ విధంగా ఉంటాయి అనే విషయాలు తెలుసుకొంటారు.
CO2	తెలుగుజాతి వివేకంలోని పద్యాల ఆధారంగా ప్రస్తుత సమాజ స్థితిని అర్థం చేసుకుంటారు. వాటిని తమ జీవితాలకు అన్వయించుకుని తమ నడవడికను తీర్చిదిద్దుకుంటారు.
CO 3	ఆంధ్రమహాభారతంలోని యయాతి కథ ద్వారా వ్యక్తిత్వ వికాసం అలవాడుతుంది. మనిషి ఎంత గొప్పవాడైనా గర్వపడితే ఎంతగా నష్టపోతాడో ఈ పాఠం ద్వారా తెలుస్తుంది.
CO 4	శ్రీశ్రీ జయభేరి కవితా ద్వారా ఆయన అభ్యుదయ సమాజాన్ని ఏ విధంగా ఆకాంక్షించాడో తెలుస్తుంది. సమసమాజ స్థాపన ద్వారా సమాజం ఏ విధంగా అభివృద్ధి చెందుతుందో వివరించాడు.
CO 5	ఆంధ్రమహాభారతంలోని వ్యాఘ్ర గోమాయు సంవాదం కథ మనుషుల మనస్తత్వం తెలుస్తుంది. ఈ పాఠం ద్వారా అభివృద్ధి నైపుణ్యం, సంభాషణ నైపుణ్యం అలవడుతుంది. అంపకం పాఠ్యభాగం ద్వారా కుటుంబంలోని వ్యక్తుల మధ్యగల ప్రేమాభిమానాలు, తండ్రికి కూతురిమీద ఉన్న అనురాగం తెలుస్తుంది.

Assessment Method:

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

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT1101	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](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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT1110	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%

Course Name	Course Code	Year & Semester	L-T-P	Credits
20PBE1101	Biology-I	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

(07 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

(06 Hours)

Nucleus: Nuclear Membrane and Nucleoplasm

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

UNIT-III

(07 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

(05 Hours)

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

UNIT-V

(05 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

(06 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 Book by David Baltimore and Harvey Lodish
2. Cell Biology, Genetics, Evolution and Ecology (M.E.), 14/e by DR. P.S. VERMA
3. The Cell: A Molecular Approach Book by Geoffrey M. Cooper
4. Microbiology Book by Pelczar.
5. Fundamentals of Biochemistry: Life at the Molecular Level, 5th Edition by Donald Voet, Judith G. Voet, Charlotte W. Pratt
6. Biochemistry by Lehninger

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%

Course Name	Course Code	Year & Semester	L-T-P	Credits
20PBE1110	Biology Lab-I	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 division.
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%

PUC-I

SEMESTER-II

Course code	Course name	Year & Semester	L-T-P	Credits
20PEG1201	English-II	I Year & II Semester	3-2-0	3

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: (08 Hours)

What Makes a Nation? – C. Rajagoopalachari (Prose) -Reading Comprehension Unseen (1 – 10) - Question Tags

UNIT-II: (07 Hours)

As I Grew Older – Langston Hughes (Poem) -Ranga's Marriage – Masti Venkatesha Iyengar - Degrees of Comparison

UNIT-III: (07 Hours)

If – Rudyard Kipling (Poem) -Reported Speech -Reported Speech – Guided Composition

UNIT-IV: (08 Hours)

To a Student – Kamala Wijeratne -Active Voice and Passive Voice -Active Voice and Passive Voice – Guided Composition

UNIT-V: (08 Hours)

Will He Come Home? – P. Sathyawathi_Translated by Y. Padmavathi (Extensive Reading) - Phrasal Verbs -Clause Analysis and Synthesis of Sentences

UNIT-VI: (07 Hours)

The summer of the Beautiful White Horse – William Saroyan (Prose) -Correction of Sentences - Role-Play – Activity & JAM Sessions

References:

1. Intermediate 1st Year English Text Book – Board of Intermediate Education, A.P.
2. Snapshots – NCERT English Supplementary Reader for Class – XI

Web resources:

1. <http://www.myenglishgrammar.com/> (Additional Problem Set)
2. Archives of RGUKT (Guided Composition & If (Poem))

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%

Course Code	Course Name	Year & Semester	L – T - P	Credits
20PMA1201	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 Moivre's 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

(09Hours)

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, Related rates of change.

Unit - VI

(16 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 %

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY1201	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.
5. To advance basic knowledge on kinetic theory of gases and specific heat capacity of gases and applications.
6. To gain basics on periodic motion and its characteristics as well simple harmonic motion with few examples in real life.

Course Content:

Unit I: Motion of System of Particles and Rigid Body dynamics (12 Hours)

Centre of mass of a two-particle system, Motion of Centre of Mass. Centre of mass for different rigid bodies, Angular displacement, angular velocity and acceleration, rotation with constant angular acceleration, relating linear and angular quantities, energy in rotational motion, Moment of Inertia, derivation of moment of inertia for uniform rod, ring, (formulas for sphere, cylinder and sheet) , Theorem of parallel axes theorem, Theorem of perpendicular axes and their applications, torque, angular momentum, conservation of angular momentum with some examples, Equilibrium of a rigid body.

Unit II: Gravitation (09 Hours)

Universal law of Gravitation, weight, acceleration due to gravity and its variation with altitude and depth, Kepler's laws of planetary motion, Gravitational Potential Energy, Gravitational Potential, motion of the satellites, Escape speed, orbital velocity of a satellite, Geostationary satellites

Unit III: Properties of Bulk Matter (12 Hours)

Elastic properties of solids: Stress and strain, Hooke's law, Young's modulus, Bulk modulus, shear modulus of rigidity and stress- strain curve, Fluid statics: Pressure due to a fluid column, Pascal's law and its application (hydraulic lift), Buoyancy and Archimedes principle, Fluid dynamics: Ideal fluid and characteristics of ideal fluid, Streamline flow, turbulent flow, equation of continuity, Bernoulli's theorem and its applications (venture-meter, Aerofoil and dynamic lift.), concept of Viscosity, Surface tension and surface energy, Angle of contact, capillary rise.

Unit IV: Heat (09 Hours)

Temperature and Heat, Measurement of Temperature with different scales, Thermal Expansion of solids, liquids and gases, Anomalous behavior of water, heat capacity, specific heat Capacity, Latent Heat, Calorimetry Principle, Heat transfer – conduction, convection and Radiation, Thermal conductivity, Newton's law of cooling, Blackbody Radiation laws.

Unit V: Thermodynamics**(10 Hours)**

Thermal Equilibrium, definition of zeroth law of Thermodynamics, Gas laws and Ideal gas equation, First law of Thermodynamics, Heat, Internal Energy and Work, Thermodynamic processes (isothermal, adiabatic, isobaric, isochoric, cyclic, reversible and irreversible), relation between P, V and T in isothermal and adiabatic process, work done in isothermal process, work done in adiabatic process, Second law of thermodynamics, Heat Engines, Refrigerators and Heat Pumps.

Unit VI: Oscillations**(08 Hours)**

Periodic and Oscillatory motions, Period and frequency, displacement as a function of time, restoring force, Simple Harmonic Motion (SHM) its characteristics, Oscillations due to a spring –block system, energy in SHM – kinetic and potential energies, simple pendulum, Damped Simple Harmonic Motion (qualitative ideas only), Forced oscillations and Resonance.

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. 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 Surface energy and will be able to relate it with a daily life.

CO 4	Understand the Different methods of heat transfer, Concept of thermal expansion and Laws of cooling.
CO 5	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
CO 6	Understand the basic concept of generation of waves along with its Classification and Mathematical analysis and SHM. Learners will be able to understand the Concept of Different forms of energy possessed by a body executing SHM with its mathematical analysis. Learners will be able to understand the Concept of Resonance, free oscillations.

Assessment Method:

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

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY1210	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 kinematics 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
20PCY1201	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

(06 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 geminal and 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%

Course code	Course name	Year & Semester	L – T – P	Credits
20PCY1210	Chemistry Lab-II	I Year & II Semester	0 – 0 – 2	1

Course Learning Objectives:

1. To prepare the standard solution
2. To estimate the concentration of a sample by titrimetric methods

Practical Syllabus:

1. Preparation of standard solutions.
2. Titrimetric exercises (Acid Vs base, Oxalic acid Vs KMnO_4 , Mohr's salt Vs KMnO_4) and use of indicators.

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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PTE1201	తెలుగు -2	I Year & II Semester	3 -0 - 0	3

Course Learning Objectives:

1. పద్యం తెలుగు వారి సొత్తు. తెలుగు సాహిత్యంలో ఎన్నో విలువైన పద్యాలను ఈ సెమిస్టర్ లో విద్యార్థులు నేర్చుకొంటారు. ఈ పద్యాలలోని నీతుల ద్వారా మన సంస్కృతి సంప్రదాయాలను అవగతం చేసుకుంటారు.
2. తెలుగుజాతి వివేకంలోని పద్యాల ద్వారా తమ నడవడికను దిద్దుకుంటారు.
3. కృషివలుడు పాఠం ద్వారా విద్యార్థులు రైతు జీవితాన్ని గురించి, అతడు పడే కష్టాల గురించి, వాటితో పాటుగా గ్రామాలలో కనిపించే ప్రకృతి సౌందర్యాన్ని గురించి తెలుసుకొంటారు.
4. పద్యలక్షణాల్ని వివరించే ఛందస్సు ఉపయోగాన్ని విద్యార్థులు తెలుసుకుంటారు. నిర్ణీతమైన గణాల కూర్పుతో పద్యపాదాలు ఎలా ఏర్పడతాయో, వాటిలో లయ ఎంతగా ప్రాధాన్యం వహిస్తుందో విద్యార్థులు గమనిస్తారు.
5. దురాశ పాఠం వల్ల విద్యార్థులు జంతువుల కథల రూపంలో మంచి నీతులను తెలుసుకొంటారు. మనిషికి దురాశ వల్ల ఏ విధమైన హాని కలుగుతుందో తెలుసుకొంటారు.
6. తెలుగుసాహిత్యంలో సమాసాల ప్రాధాన్యతను గుర్తిస్తారు. అంతేగాక కైలాసదూత ప్రార్యభాగం ద్వారా ప్రహసనాల ప్రాధాన్యతను గుర్తిస్తారు. ప్రారంభం నుంచి ముగింపు వరకూ హాస్యాన్ని పుట్టించే ప్రహసనాలు సమాజంలోని మూఢనమ్మకాలను, మూఢభక్తిని ఎలా ప్రతిబింబించాయో తెలుసు కుంటారు. సమాజంలో చైతన్యాన్ని కలిగించడంలో ప్రహసనాలు ఎలా దోహదపడ్డాయో తెలుసుకుంటారు.

Course Content:

Unit – I	తెలుగుజాతి వివేకం 41-60 పద్యాలు	(6Hours)
Unit - II	తెలుగుజాతి వివేకం 61 - 80	(6 Hours)
Unit - III	కృషివలుడు - దువ్వూరి రామిరెడ్డి	(9 Hours)
Unit - IV	సంధులు	(6 Hours)
Unit - V	దురాశ	(9 Hour)
Unit - VI	సమాసాలు	(4 Hours)

తెలుగు సంధులు: అత్త్యసంధి, ఇత్త్యసంధి, ఉత్త్యసంధి, యడాగమసంధి, గసడదవాదేశసంధి, దృతప్రకృతిక సంధి (సరళాదేశసంధి), సంస్కృత సంధులు: సవర్ణదీర్ఘసంధి, వృద్ధిసంధి, యణాదేశసంధి

తత్పురుష సమాసం, సమానాధికరణం, ద్విగుసమాసం, సంభావనా పూర్వపద కర్మధారయ సమాసం, అవధారణ పూర్వపద కర్మధారయ సమాసం, బహువ్రీహి సమాసం, ద్వంద్వసమాసం, కైలాసదూత ప్రహసనం - చిలకమర్తి

Learning resources

Text book:

1. తెలుగు జాతి వివేకం (నీతి ధర్మ లోకోక్తులు), సంకలనం ఉండేల మాలకొండారెడ్డి.డా., పరిష్కృతవాచస్పతి -, ఆచార్య కుసుమారెడ్డి.కె., ప్రచురణరాజీవ్ గాంధీ వైజ్ఞానిక సాంకేతిక విశ్వవిద్యాలయం :, 2010 (రెండవ ముద్రణ).

Reference Books:

1. శతక పద్య మంజరి – విశాలాంధ్ర పబ్లికేషన్స్
2. తెలుగు సాహిత్య సమీక్ష-1, భాగాలు 2, డాక్టర్ జినాగయ్య ., నవ్య పరిశోధక ప్రచురణలు, తిరుపతి.
3. తెలుగు సాహిత్య చరిత్ర, డాశాస్త్రి .నా.ద్వా ., ప్రగతి పబ్లికేషన్స్, విజయవాడ.
4. ఆంధ్ర మహాభారతం, తిరుమల తిరుపతి దేవస్థానం ప్రచురణలు, తిరుపతి.
- 6 ఆంధ్ర కవుల చరిత్ర-1,2,3 భాగాలు, కందుకూరి వీరేశలింగం పంతులు, అన్ని పుస్తక విక్రయ కేంద్రాలు.
- 7 సులక్షణ సారము(చందశాస్త్రము), డాజొన్నలగడ్డ మృత్యుంజయ రావు ., రోహిణి పబ్లికేషన్స్, రాజమండ్రి, తృతీయ ముద్రణ, 2007
- 8 తెలుగు వ్యాకరణం, ఎంవిశ్వనాథరాజు ., నవరత్న బుక్ హౌస్, విజయవాడ, 1998.
- 9 రోజుకో పద్యం, మల్లాది హనుమంతరావు, అన్ని పుస్తక విక్రయ కేంద్రాలు .

Web resources:

1. RGUKT course content

పై పాఠాలకు సంబంధించి డా. రాళ్ళబండి కవితా ప్రసాద్, ఆచార్య డా. కె.కుసుమారెడ్డి, డా. ఉండేల మాలకొండారెడ్డి వంటి ప్రసిద్ధ సాహితీవేత్తల వీడియోలు ఉన్నాయి. వీటికి సంబంధించిన వీడియోలు ఆర్జీయూకేటీ వెబ్ లింక్ లో అందుబాటులో ఉంటాయి.

Course outcomes:

పీయూసీ మొదటి సంవత్సరపు విద్యార్థులు రెండవ సెమిస్టరులో ఈ కింది పాఠ్యాంశాలను నేర్చుకుంటారు.

CO 1	‘తెలుగుజాతివివేకం’పుస్తకంలోని పద్యాల ద్వారా భావవ్యక్తీకరణ, నీతి, విలువలు నేర్చుకొంటారు. సమాజంలో సజ్జనుల ఏ విధంగా ఉంటారు, దుర్జనులు ఏ విధంగా ఉంటారన విషయం మనకు అవగతమవుతుంది. మంచి చెడులను బేరీజు వేసుకొనే విచక్షణా గుణం అలవడుతుంది.
CO 2	తెలుగులోని పద్యసాహిత్యం వైభవాన్ని, పద్యనిర్మాణంలోని విలక్షణతను, వివిధ శతకకర్తలు ప్రతిపాదించిన సామాజిక అంశాలను నేర్చుకుంటారు.
CO 3	వ్యవసాయరంగంలో భారతదేశ ప్రాధాన్యాన్ని, రైతు శ్రమ జీవితాన్ని, ప్రకృతి పరవశత్వాన్ని విద్యార్థులు గ్రహించగలుగుతారు.
CO 4	సంధి అంటే ఏమిటో, సంధి ప్రాధాన్యం ఏమిటో విద్యార్థులు గ్రహిస్తారు. పదాల మధ్య సంధి ఏయే మార్పుల్ని కలిగిస్తుందో విద్యార్థులు తెలుసుకుంటారు. పదవిభజనపై అవగాహనను పెంచుకుంటారు.
CO 5	కొరవి గోపరాజు దురాశ పాఠ్యాంశం ద్వారా మనిషి అసూయపడుతే జీవితంలో ఎంతగా నష్టపోతాడో తెలుస్తుంది. దురాశ దుఃఖానికి చేటనే నీతి అందరికీ తెలుస్తుంది.
CO 6	తెలుగుసాహిత్యంలో సమాసాల ప్రాధాన్యాన్ని గ్రహిస్తారు. అంతేగాక ప్రహసన లక్షణాలను, చిలకమర్తి కైలాస దూత ప్రహసనం ద్వారా కొంతమంది దుర్మార్గులు మనుషులను సమాజంలో భక్తి పేరుతో ఏ

	విధంగా మోసం చేస్తారో తెలుసుకుంటారు.
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Assessment Method:

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

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT1201	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

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 Calc (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, matrices 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*
3. LaTeX Companion - Leslie Lamport, PHI/Pearson.

Reference Books:

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

Web resources:

1. RGUKT course content
2. <http://www.tutorialsforopenoffice.org/>
3. 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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT1210	Open office & LATEX Lab	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, countif, 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), Inserting – Background, textures, Design Templates, Hidden slides.

Web resources:

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

Course Outcome:

1. Understand how to create documents using Open Office writer
2. Understand how to work on Open Office Calc
3. Understand how to create Power point document using Open Office Impress
4. Successfully install LaTeX and its related components on a home/personal computer
5. Use LaTeX and various templates acquired from the course to compose Mathematical
6. documents, presentations, and reports;
7. 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%

Course Name	Course Code	Year & Semester	L-T-P	Credits
20PBE1201	Biology-II	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%

Course Name	Course Code	Year & Semester	L-T-P	Credits
20PBE1210	Biology Lab-II	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%

PUC-II

SEMESTER-I

Course code	Course name	Year & Semester	L-T-P	Credits
20PEG2101	English-III	II Year & I Semester	3-2-0	3

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: (07 Hours)

Of Studies – Francis Bacon (Prose) -Conversation Practice – I (1-5)

UNIT-II: (08 Hours)

On His Having Arrived at the Age of Twenty-Three – John Milton (Poem) - 2.2: Syllables (Study Skills and Communication Skills) - 2.3: Interpretation of Non-Verbal Information – Pie Charts, Tree Diagrams & Tables

UNIT-III: (08 Hours)

In Celebration of Being Alive – Dr. Christian Barnard (Prose) -Reading Comprehension – I (Study Skills and Communication Skills) -Interpretation of Non-Verbal Information – Bar Graphs and Flow Charts

UNIT-IV: (07 Hours)

The Tables Turned – William Wordsworth (Poem) -Foreign Phrases Commonly used in English (myenglishgrammar.com) -Word Stress

UNIT-V: (07 Hours)

J. C. Bose – Aldous Huxley (Prose) -Speech Sounds – Word Formation and Identification (Communication Skills) -Letter Writing – I (Informal)

UNIT-VI: (08 Hours)

The Builders – Henry Wadsworth Longfellow (Poem) -The Tempest – William Shakespeare (Drama – An Abridged Version) -Correction of Sentences (Grammar)

Learning Resources:

Text book:

1. Intermediate 2nd Year English Text Book – Board of Intermediate Education, A.P.

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%

Course Code	Course Name	Year & Semester	L – T - P	Credits
20PMA2101	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)

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 %

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY2101	Physics-III	II Year & I Semester	4-2-0	4

Course Learning Objectives:

1. 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.
2. Students will learn the origin of electric charges and forces between charges, electric fields associated around charges of different geometries.
3. 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.
4. 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.
5. 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.
6. 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.

Course Content:

Unit I: Waves

(10 Hours)

Wave motion: Longitudinal and Transverse waves, speed of longitudinal wave in a fluid, speed of a transverse wave on stretched string, wave interference, standing waves in a string, normal modes in a string, Displacement variation and pressure variation a progressive sound wave, speed of sound waves, Principle of superposition of waves, Reflection of waves, standing sound waves in organ pipes, fundamental mode and harmonics, Resonance, Beats, Doppler Effect

Unit II: Electrostatics-1

(10 Hours)

Electric charges and their conservation, Coulomb's law, Principle of Superposition, Electric field due to a point charge, electric field due to charge distribution (derivation of electric field due to line of charge), Electric Field Lines; Electric Dipole, Electric field of a electric dipole; torque on a dipole in a uniform electric field, Electric flux, Gauss's law and its applications to find field due to infinitely long straight uniformly charged wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell and solid sphere (field inside and outside).

Unit III: Electrostatics II

(10 Hours)

Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; Equipotential surfaces, electrical potential energy of a system of two and more point charges, electric dipoles in an electrostatic field, Conductors and insulators, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, Energy stored in a capacitor.

Unit IV: Current electricity

(10 Hours)

Electric current, flow of electric charges in a metallic conductor, Drift velocity and mobility, and their relation with electric current, Ohm's law, electrical resistance, electrical energy and power, electrical resistivity and conductivity, Combination of Resistors in series and in parallel; Internal resistance of a cell, potential difference and EMF of a cell, combination of cells in series and parallel, Kirchhoff's laws and simple applications, Wheatstone bridge.

Unit V: Magnetic Effects of Current**(10 Hours)**

Concept of magnetic field, Force on a moving charge in uniform magnetic field, Ampere's law and its applications to infinitely long straight thin wire, Force on a current-carrying conductor in a uniform magnetic field, Magnetic Field Due to Solenoid and Toroid, Magnetic field due to a current Element-Biot-Savart's law and its applications, Torque on a rectangular current loop in a uniform magnetic field and magnetic dipole,

Unit VI: Magnetism and Electromagnetic Induction**(10 Hours)**

Magnetic field lines, Earth's Magnetic Field, Magnetization, Magnetic Intensity and Susceptibility, Magnetic Properties of Materials. Electromagnetic induction, Motional Electromotive force, induced emf and Induced current, Faraday's law and Lenz's Law, eddy currents, self and mutual inductance.

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 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 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 %

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY2210	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 of electricity 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
20PCY2101	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 Boron, carbon and nitrogen family elements.

Course content:

UNIT-I: Solid State

(08 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. X-ray crystallography-Braggs equation.

UNIT-II: Electrochemistry

(12 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

(10 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: p -Block Elements

(12 Periods)

General Introduction to p -Block Elements

Group 13 Elements: General introduction, electronic configuration, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of the first element of the group. Diagonal relationship between B and Al. Preparation and properties of diborane.

Group 14 Elements: General introduction, electronic configuration, variation of properties, oxidation states, trends in chemical reactivity, anomalous behavior of first elements. Carbon-catenation, allotropic forms of carbon.

Group -15 Elements: General introduction, electronic configuration, oxidation states, trends in physical & chemical properties; Oxides of Nitrogen (Structure only); Phosphorus - allotropic forms, compounds of Phosphorus: Phosphorus Halides and Oxo acids (elementary idea only).

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 %

Course Code	Course Name	Year & Semester	L – T – P	Credits
20PCY2110	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. Cations: Pb^{2+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Zn^{2+} , Ni^{2+} , Ca^{2+} , Ba^{2+} , Mg^{2+} , NH_4^+ .
 - ii. Anions: CO_3^{2-} , S^{2-} , SO_4^{2-} , NO_3^- , NO_2^- , Cl^- , Br^- , I^- .

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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PTE2101	తెలుగు – 3	II Year & I Semester	3-0-0	3

Course Learning Objectives:

1. పీయూసీ ద్వితీయ సంవత్సరం విద్యార్థులు ఈ రెండు సెమిస్టర్లలో పద్య, గద్య భాగాలును రెండింటినీ చదువుతారు. పద్యభాగం నుండి 'తెలుగుజాతివివేకం'లోని 40పద్యాలు చదివి వాటిలోని సారాన్ని గ్రహించగలుగుతారు. , మొల్ల- హనుమత్సందేశం అనే పాఠాలు, గద్య భాగం నుండి అనువాదం, మన పండుగలు అనే పాఠాలు ఉన్నాయి.
2. పద్యభాగం నుండి విద్యార్థులు తెలుగు సాహిత్యంలోని శతకాలు, వాటికి సంబంధించిన భావాలు, వ్యాఖ్యానాలు, వాటిలోని ముఖ్య విశేషాలు తెలుసుకుంటారు. పద్యాల ద్వారా సమాజంలో ఎలా జీవించాలి, అందరితో సఖ్యతగా ఉండటం, దుర్జనుల స్వభావం, లోకంలో మనుషుల స్వభావం, సత్యం యొక్క గొప్పతనం, లోకంలో రకరకాల మనుషులు ఉంటారు వారిని ఎలా అర్థం చేసుకోవాలో తెలుసుకుంటారు.
3. 'హనుమత్సందేశం' అనే పాఠంలో కవయిత్రిగా మొల్లను గురించి తెలుసుకుంటారు. ఇంకా ఇతిహాసాలలో రామాయణం ప్రత్యేకత, అందులో సీతమ్మకు హనుమంతుడు తీసుకువెళ్ళే రామసందేశం (సుందరకాండ ఘట్టం) ఎంతో ప్రముఖమైనది. అనువాద పద్ధతులు, అనువాద దోషాలు, ప్రయోజనాలు, అనువాద సమస్యలు మొదలైనవి తెలుసుకుంటారు.
4. 'శృశానవాటి' పాఠంద్వారా సమాజంలోని అసమానతలు విద్యార్థులు గ్రహించగలుగుతారు. గుర్రం జాషువా పద్యరచనా వైశిష్ట్యాన్ని, సమాజంలోని అసమానతలు తొలగించడానికి. ఎంత వైభోగంగా బతికినా మనిషి చనిపోయిన తర్వాత శృశానంలో ఏ విధమైన అసమానతలుండవనే విషయాన్ని విద్యార్థులు గ్రహించగలుగుతారు.
5. కలవారి కోడలూ కలికి కామాక్షి పాఠ్యభాగం ద్వారా పల్లెటూళ్లలోని కుటుంబాల మధ్య అనుబంధం, ఆడపిల్లలకు పుట్టింటిపై ఉండే మమకారం, అన్నదమ్ముల పట్ల ఆడపిల్లలకు ఉండే ఆప్యాయతలు విద్యార్థులు గుర్తించగలుగుతారు.
6. మన పండుగలు పాఠ్యభాగం ద్వారా మన సమాజంలో పండుగలకు ఉన్న ప్రాశస్త్యాన్ని విద్యార్థులు తెలుసుకుంటారు. సామూహికంగా అవలంబించే పండుగలు మనుషులలో సామరస్య పూర్వక వాతావరణానికి దారితీసే పరిస్థితుల్ని అవగాహన చేసుకుంటారు.

Course Content:

Unit - I	తెలుగుజాతి వివేకం 81-100 పద్యాలు	(7 hours)
Unit - II	తెలుగుజాతి వివేకం 101 -1 20	(7 hours)
Unit - III	హనుమత్సందేశం - మొల్ల	(10 hours)
	అనువాదం	

అనువాదం – నిర్వచనం, అనువాదం – ప్రయోజనం, అనువాద దోషాలు, అనువాద లక్ష్యాలు

Unit - IV	శృశానవాటి	(6 hours)
Unit - V	కలవారి కోడలూ కలికి కామాక్షి	(6 hours)
Unit - VI	మన పండుగలు	(6 hours)

సంక్రాంతి, ఉగాది, శ్రీరామనవమి, దసరా, దీపావళి, క్రీస్మస్, రంజన్

Learning resources

Text book:

1. తెలుగు జాతి వివేకం, (నీతి, ధర్మ లోకోక్తులు), సంకలనం ఉండేల మాలకొండారెడ్డి, రాజీవ్ గాంధీ వైజ్ఞానిక సాంకేతిక విశ్వవిద్యాలయం, 2010.

Reference Books:

1. శతక పద్య మంజరి - విశాలాంధ్ర పబ్లికేషన్స్
2. తెలుగు సాహిత్య సమీక్ష - జి.నాగయ్య, నవ్య పరిశోధక ప్రచురణలు, తిరుపతి.
3. తెలుగు సాహిత్య చరిత్ర - ద్వా.నా.శాస్త్రి, ప్రగతి పబ్లికేషన్స్, విజయవాడ.
4. రోజుకో పద్యం - మల్లాది హనుమంతరావు, అన్ని పుస్తక విక్రయ కేంద్రాలు.
5. మొల్ల రామాయణం.
6. విశ్వనాథ వారి కిన్నెరసాని పాటలు, విశ్వనాథ పబ్లికేషన్స్, విజయవాడ.
7. ఉషశ్రీ రచనలు (భారతం, భాగవతం, రామాయణం), ఉషశ్రీ మహాలక్ష్మి బుక్ కార్పొరేషన్, విజయవాడ.
8. తెలుగు ఇంగ్లీషు డిక్షనరీ - శంకర నారాయణ, ఏషియన్ ఎడ్యుకేషనల్ సర్వీసెస్, ఢిల్లీ.
9. శబ్దరత్నాకరము, బహుజనపల్లి సీతారామచార్యులు, విక్టరీ పబ్లికేషన్స్, విజయవాడ.

Web resources:

1. RGUKT Course Content

పై పాఠాలకు సంబంధించి డా. రాళ్ళబండి కవితా ప్రసాద్, ఆచార్య డా. కె.కుసుమారెడ్డి, డా. ఉండేల మాలకొండారెడ్డి వంటి ప్రసిద్ధ సాహితీవేత్తల వీడియోలు ఉన్నాయి. వీటికి సంబంధించిన వీడియోలు ఆర్జీయూకేటీ వెబ్ లింక్ లో అందుబాటులో ఉంటాయి.

Course outcomes:

పీయూసీ 1 రెండవ సంవత్సరం మొదటి సెమిస్టర్లో విద్యార్థులు ఈ కింది పాఠ్యాంశాలను నేర్చుకుంటారు.

CO 1	తెలుగుజాతివివేకం పుస్తకంలోని నీతి, విలువలు నేర్చుకొంటారు. సమాజంలో ఎలా జీవించాలి. ఎవరి దగ్గర ఎలా ఉండాలి, ఎలా మాట్లాడాలి, దుర్జనుల గురించి తెలుసుకొంటారు.
CO 2	తెలుగుజాతివివేకం పుస్తకంలోని నీతి, విలువలు నేర్చుకొంటారు. సమాజంలో ఎలా జీవించాలి. ఎవరి దగ్గర ఎలా ఉండాలి, ఎలా మాట్లాడాలి, దుర్జనుల గురించి తెలుసుకొంటారు.

CO 3	‘హనుమత్సందేశం’ పాఠం ద్వారా విద్యార్థులు సంభాషణా చాతుర్యం, రాయబారికి ఉండవలసిన ముఖ్య లక్షణాలు, పెద్దలు స్త్రీలను గౌరవించడం, వినయం మొదలైన అంశాలతోపాటు రామాయణం విశిష్టత, పరమార్థం, రావణుడి చెరనుండి సీతమ్మను రాముడు తీసుకురావడం వెనుక ఉన్న అంతరార్థం ఇలా ఎన్నో విషయాలు తెలుసుకోవచ్చు. ‘అనువాదం’ పాఠం ద్వారా భాష పట్ల అవగాహన, అనువాద పద్ధతులు, రెండు భాషలలో ఉండే వ్యత్యాసాలు, భాష మీద పట్టు ఏర్పడి, అనువాదం చేయడంలో మెలకువలు వంటివి తెలుసుకుంటారు.
CO 4	శ్మశానవాటి పార్యభాగం ద్వారా మనుషుల్లోని అసమానతలు శ్మశానంలో ఎలా తొలగిపోతాయో వివరిస్తారు రచయిత. ఆయా పద్యాలను చదవడం ద్వారా విద్యార్థులు అనేక విషయాలు గ్రహించగలుగుతారు.
CO 5	తెలుగుసమాజంలోని కుటుంబాల్లో ఉండే ఆస్పాయతానురాగాలను విద్యార్థులు అర్థం చేసుకోగలరు. ఆడపిల్లలకు పుట్టింటిపై ఉండే మమకారం, తోడబుట్టిన వాళ్లమధ్య ఉండే అనురాగాలను విద్యార్థులు అవగాహన చేసుకుంటారు.
CO 6	తెలుగుసమాజంలో పండుగలకు ఎంతో ప్రాశస్త్యం ఉంది. అందరినీ ఒకచోట చేర్చి సామూహికంగా ఐక్యం చేయగలిగిన పండుగల వల్ల సాంస్కృతికంగా ఎలాంటి వ్యాప్తి ఉంటుందో, మనుషుల మధ్య మతసామరస్యాన్ని పెంపొందించగలిగిన విధానం ఎలా ఉంటుందో విద్యార్థులు అర్థం చేసుకోగలుగుతారు.

Assessment Method:

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

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT2101	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, KOSENT LEARNING SOLUTIONS INC

Web resources:

1. RGUKT course content
2. <http://cbseacademic.nic.in/cirriculum-2021.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 %

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT2110	Web designing 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, predefined 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%

Course Name	Course Code	Year & Semester	L-T-P	Credits
20PBE2101	Biology-III	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 %

Course Code	Course Name	Year & Semester	L-T-P	Credits
20PBE2110	Biology Lab-III	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 Outcome:

1. Students can understand about the identification of blood groups.
2. Student will understand about structure of human joints.
3. Student will understand the difference between histology slides of epithelium, muscle, blood smear, T.S of liver.
4. Student will understand sense organs structure of eye and ear
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
20PEG2201	English-IV	II Year & II Semester	3-2-0	3

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 vocabulary of the student in specific registers of English language
4. To improve the imaginative powers of the students vis-a-vis reading fiction
5. To infer the moral values embedded in fiction and to correlate them to the nagging issues in our society
6. To enable the student to write their CV and Cover Letter

Course Content:

UNIT-I: (08 Hours)

The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) (*About the Story, List of Characters & Chapter – I: Tom and the Fence*) -Conversation Practice – II (6-15) (Study Skills and Communication Skills) -Vocabulary

UNIT-II: (07 Hours)

The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) (*Chapter – II: Tom and Huck and Chapter –III: The Graveyard*) -Learning from the West – N.R Narayana Murthy (Prose) -The Language of Advertisements – I

UNIT-III: (07 Hours)

The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) (*Chapter – IV: Jackson's Island*) -Reading Comprehension – II (Study Skills and Communication Skills) - The Language of Advertisements – II

UNIT-IV: (08 Hours)

The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) (*Chapter – V: The Trial and Chapter –VI: The Haunted House*) (3L+2T) -Conditionals -Completing a Form

UNIT-V: (08 Hours)

The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) (*Chapter – VII: McDougal's Cave*) -Curriculum Vitae -Letter Writing – II (Formal)

UNIT-VI: (07 Hours)

The Adventures of Tom Sawyer – Mark Twain (Non-detailed Text) (*Chapter – VIII: The Treasure*) -Any Woman – Katherine Tynan (Poem) -Comprehension Passages (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%

Course Code	Course Name	Year & Semester	L – T - P	Credits
20PMA2201	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

(14 Hours)

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

Unit – II

(10 Hours)

CONIC SECTIONS: Circle, Parabola, Ellipse, Hyperbola, Classifying Conic Sections by Eccentricity, Quadratic Equations in two variables.

Unit – III

(18 Hours)

PARAMETRIZATION & POLAR COORDINATES: 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

(15 Hours)

MATRICES: 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

(10 Hours)

INFINITE SERIES: Binomial Series, Geometric Series, Arithmetic- Geometric Series, Exponential Number, Exponential Series, Logarithmic Series.

Unit – VI

(8 Hours)

VECTOR ALGEBRA: 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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY2201	Physics-IV	II Year & II Semester	4-2-0	4

Course Learning Objectives:

1. To get familiarity with behavior of passive components in Alternating current circuits and working and construction of alternating current circuits.
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: Alternating Currents

(10 Hours)

Alternating currents: Resistor circuit, capacitor circuit, inductor circuit, RC circuit, free oscillations of an LC circuit, Freely oscillating LCR circuit, forced oscillations, series oscillating RLC circuit with oscillating emf, Transformers.

Unit II: Electromagnetic Waves

(08 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

(10 Hours)

Reflection and refraction of light, law of reflection and refraction(snell's law), Total Internal Reflection and its applications, dispersion of light through a prism, plane mirror, spherical mirrors(concave and convex), mirror formula, Refraction at spherical surface, thin lenses formula, Lens-Maker's Formula, Magnification, Power of a lens.

Unit IV: Wave Optics:

(10 Hours)

Wave fronts and Huygens's Principle, Reflection and Refraction of plane wave at a plane surface using wave fronts, Interference: coherent sources, Young's double slit experiment and expression for fringe width and intensity. Diffraction due to single slit, Width of the slit and width of central maximum, intensity, Plane Polarized light and Polarization; Brewster's law.

Unit V: Dual Nature of Matter and Nuclei

(10 Hours)

Photoelectric effect and Einstein's photoelectric equation – particle nature of light, Matter waves – wave nature of particles, de Broglie Equation, Heisenberg uncertainty principle, Composition and size of nucleus and Atomic Masses, isotopes, isobars and isotones, Mass-Energy Relation of Nuclei, Nuclear Binding Energy per Nucleon and Mass Defect, Radioactivity – alpha, beta and gamma rays, Nuclear Fission and Fusion.

Unit VI: Electronic Devices**(12 Hours)**

Semiconductors: I-V characteristics of pn junction diode in forward and reverse bias, Application of a Junction diode as a rectifier. I-V characteristics of LED, photodiode, Principle of solar cell, Zener diode and Zener diode as a voltage regulator, Transistor, Transistor- characteristics; transistor as an amplifier (common emitter configuration) Logic gates (OR, AND, NOT, NAND and NOR).

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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PPY2210	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%

Course Code	Course Name	Year & Semester	L – T – P	Credits
20PCY2201	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: Organic Chemistry – III

(10 Hours)

Aldehydes & Ketones: 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 & Cannizzaro reaction only).

UNIT-II: Organic Chemistry – IV

(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. HVZ 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-basidity of amines, alkylation, acylation, diazotization, carbylamines reaction. Distinguishing amines using Hinsberg reagent (PhSO₂Cl). Aniline-preparation, and properties.

UNIT-III: 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, & aluminum from their ores, Uses of iron, copper, & aluminum.

UNIT- IV: Surface Chemistry

(08 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, Brownian movement, electrophoresis, Emulsions and cleansing action of soap

UNIT-V: d-block and coordination compounds

(12 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 chemistry: Introduction, Nomenclature of coordination compounds – Theories of coordination compounds (Werner's theory, Sidgwick's & Valence bond theory only). Isomerism (geometrical & optical isomerism).

UNIT-VI: Polymers

(10 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%

Course Code	Course Name	Year & Semester	L – T – P	Credits
20PCY2210	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

Practical Syllabus

1. Organic compound analysis. (6 organic compounds)

Functional Groups: Hydroxyl, phenol, carbohydrates, aldehyde, ketone, Carboxylic and amines

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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PTE2201	తెలుగు – 4	II Year & II Semester	3-0-0	3

Course Learning Objectives:

1. పీయూసీ ద్వితీయ సంవత్సరం విద్యార్థులు ఈ రెండవ సెమిస్టరులో పద్య, గద్య భాగాలును రెండింటినీ చదువుతారు. పద్యభాగం నుండి 'తెలుగుజాతివివేకం'లోని 40పద్యాలు, పోతన- ప్రహ్లాదుని విద్య అనే పాఠాలు, గద్య భాగం నుండి వ్యాసం, వ్యాసాలు అనే పాఠాలు ఉన్నాయి.
2. పద్యభాగం నుండి విద్యార్థులు తెలుగు సాహిత్యంలోని శతకాలు, వాటికి సంబంధించిన భావాలు, వ్యాఖ్యానాలు, వాటిలోని ముఖ్య విశేషాలు తెలుసుకుంటారు. పద్యాలలో లోకస్వభావ పద్ధతి, అహింసా పద్ధతి, వేదాంత పద్ధతి అనే వాటి ద్వారా సమాజంలో ఎలా జీవించాలి, అందరితో సఖ్యతగా ఉండటం, హింస ద్వారా కాకుండా అహింస ద్వారా దేనినైనా సాధించవచ్చునని తెలుసుకుంటారు.
3. మహాభారతంలోని 'ప్రహ్లాదుని విద్య' పాఠంలో తెలుగు సాహిత్యం పట్ల అవగాహనను కలిగించే దిశగా కొన్ని విషయాలు నేర్చుకుంటారు. ఎవరి బాధ్యత ఎంత వరకు ఉంది అనే అంశాలతోపాటు తండ్రి పిల్లవాడి పట్ల చూపవలసిన శ్రద్ధ, బాధ్యత అనే అంశాలు కనిపిస్తాయి. వీటితోపాటు తండ్రిగా హిరణ్యకశిపుడు ఎంత దుర్మార్గుడైనప్పటికీ కుమారుడి పట్ల చూపిన ప్రేమ, చదువు గురించి చెప్పిన మంచి విషయాలు గొప్పగా ఉంటాయి.
4. తెలుగుసాహిత్యంలో అలంకారాల ప్రాధాన్యాన్ని, కావ్యసౌందర్యాన్ని ఇనుమడింపజేయడంలో అర్థాలంకారాల, శబ్దాలంకారాల ప్రాధాన్యాన్ని గురించి విద్యార్థులు గ్రహించగలుగుతారు.
5. పద్యలక్షణాల్ని వివరించే ఛందస్సు ఉపయోగాన్ని విద్యార్థులు తెలుసుకుంటారు. నిర్ణీతమైన గణాల కూర్పుతో పద్యపాదాలు ఎలా ఏర్పడతాయో, వాటిలో లయ ఎంతగా ప్రాధాన్యం వహిస్తుందో విద్యార్థులు గమనిస్తారు.
6. 'వ్యాసం, వ్యాసాలు' ఈ పాఠాలు విద్యార్థులకు ఆలోచనాశక్తిని, రాయగలిగే నైపుణ్యాన్ని కలిగిస్తాయి.

Course Content:

Unit – I	తెలుగుజాతి వివేకం 121-140 పద్యాలు	(7 Hours)
Unit - II	తెలుగుజాతి వివేకం 1411-6 పద్యాలు 0	(7 Hours)
Unit - III	ప్రహ్లాదుని విద్య –బమ్మెర పోతన	(11 Hours)
Unit - IV	అలంకారాలు	(6 Hours)

శబ్దాలంకారాలు: ఛేదనానుప్రాసాలంకారం, అంత్యానుప్రాసాలంకారం, టానుప్రాసాలంకారం, వృత్తానుప్రాసాలంకారం, యమకం, అర్థాలంకారాలు: ఉపమాలంకారం, ఉత్పేక్షాలంకారం, స్వభావోక్తి, రూపకాలంకారం, అతిశయోక్తి, అర్థాంతరన్యాసాలంకారం

Unit - V	ఛందస్సు (5మాడ్యూల్స్)	(7 Hours)
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జాతులు: కందం, ద్విపద ,ఉపజాతులు: ఆటవెలది, తేటగీతి, సీసం , ముత్తాలసరం

వ్యాసం - నిర్వచనం

వ్యాసాలు (7 మాడ్యూల్స్)

పర్యావరణ పరిశుభ్రత, శాస్త్ర సాంకేతిక విజ్ఞానము, విద్యార్థులు క్రమశిక్షణ, సేవానిరతి,

మదర్ థెరిస్సా, రాజీవ్ గాంధీ

Learning resources**Text book:**

1. తెలుగు జాతి వివేకం, (నీతి, ధర్మ లోకోక్తులు), సంకలనం ఉండేల మాలకొండారెడ్డి, రాజీవ్ గాంధీ వైజ్ఞానిక సాంకేతిక విశ్వవిద్యాలయం, 2010.

Reference Books:

1. శతక పద్య మంజరి - విశాలాంధ్ర పబ్లికేషన్స్
2. తెలుగు సాహిత్య సమీక్ష - జి.నాగయ్య, నవ్య పరిశోధక ప్రచురణలు, తిరుపతి.
3. తెలుగు సాహిత్య చరిత్ర - ద్వా.నా.శాస్త్రి, ప్రగతి పబ్లికేషన్స్, విజయవాడ.
4. రోజుకో పద్యం - మల్లాది హనుమంతరావు, అన్ని పుస్తక విక్రయ కేంద్రాలు.
5. ఉషశ్రీ రచనలు (భారతం, భాగవతం, రామాయణం), ఉషశ్రీ మహాలక్ష్మీ బుక్ కార్పొరేషన్, విజయవాడ.
6. సంపూర్ణ నీతి చంద్రిక-పరవస్తు చిన్నయసూరి, రోహిణి పబ్లికేషన్స్, విజయవాడ.

Web resources:**1. RGUKT course content**

పై పాఠాలకు సంబంధించి డా. రాళ్ళబండి కవితా ప్రసాద్, ఆచార్య డా. కె.కుసుమారెడ్డి, డా. ఉండేల మాలకొండారెడ్డి వంటి ప్రసిద్ధ సాహితీవేత్తల వీడియోలు ఉన్నాయి. వీటికి సంబంధించిన వీడియోలు ఆర్జీయూకేటీ వెబ్ లింక్ లో అందుబాటులో ఉంటాయి.

Course outcomes:

పీయూసీ రెండవ సంవత్సరం రెండవ సెమిస్టర్ పాఠ్యభాగాల నుంచి విద్యార్థులు ఈ కింది అంశాలు నేర్చుకుంటారు.

CO 1	తెలుగు జాతి వివేకం లో 40 పద్యాలు నేర్చుకుంటారు. దీని ద్వారా విద్యార్థులకు ధారణాశక్తి పెరుగుతుంది. ఇంకా వీటిల్లో ఉండే పద్యాల వలన ఛందస్సు, పద్యాలను ఏ విధంగా రాయాలో కొంత నైపుణ్యం కూడా ఏర్పడుతుంది.
CO 2	తెలుగు జాతి వివేకం లో 40 పద్యాలు నేర్చుకుంటారు. దీని ద్వారా విద్యార్థులకు ధారణాశక్తి పెరుగుతుంది. ఇంకా వీటిల్లో ఉండే పద్యాల వలన ఛందస్సు, పద్యాలను ఏ విధంగా రాయాలో కొంత నైపుణ్యం కూడా ఏర్పడుతుంది.

CO 3	‘ప్రజ్ఞాదుని విద్య’ ఈ పాఠం ద్వారా విద్యార్థులకు గురువులకు, గురువులకు తల్లిదండ్రులకు, తల్లిదండ్రులకు పిల్లలకు మధ్య ఉన్న సంబంధాలు, బాధ్యతలు తెలుసుకుంటారు. అలాగే హిరణ్యకశిపుని కథ తెలుసుకుంటారు. ఇంకా మంచి-చెడుల మధ్య పోరాటం వంటి అనేక అంశాలు విద్యార్థులు తెలుసుకుంటారు.
CO 4	అలంకారాలు కావ్యానికి ఎంత సౌందర్యాన్ని కలిగిస్తాయో విద్యార్థులు గమనిస్తారు. శబ్దాలంకారాలు, అర్థాలంకారాల ప్రాధాన్యాన్ని, కావ్యంలో వాటి ప్రయోగాలను గ్రహించడానికి వీలు కలుగుతుంది.
CO 5	పద్యలక్షణాల్ని వివరించే ఛందస్సు ఉపయోగాన్ని విద్యార్థులు తెలుసుకుంటారు. నిర్ణీతమైన గణాల కూర్పుతో పద్యపాదాలు ఎలా ఏర్పడతాయో, వాటిలో లయ ఎంతగా ప్రాధాన్యం వహిస్తుందో విద్యార్థులు గమనిస్తారు.
CO 6	‘వ్యాసాలు’ ఈ పాఠం ద్వారా వ్యాసాలను కొన్ని రకాలుగా విభజన చేసి వాటిని ఏవిధంగా రాయాలో ఉదాహరణగా చూపించటం జరుగుతుంది. దీనివల్ల విద్యార్థుల్లో వ్యాసాలను రాయగలిగే నైపుణ్యం, అవగాహనాశక్తి పెరుగుతుంది. ఆలోచనాశక్తి మెరుగుపడి ఒక అంశాన్ని ఏ విధంగా రాయాలో తెలుసుకోవడంతోపాటు ఒక విషయాన్ని ఏ కోణంలో ఆలోచించాలో తెలుసుకుంటారు.

Assessment Method:

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

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT2201	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 user-defined 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 (05 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, Nested 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: List and Tuples (05 Hours)

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

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

Unit V: Strings and Dictionary

(04 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

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:

1. Python programming using problem solving approach by REEMA THAREJA
2. Introduction to programming using Python by 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%

Course code	Course name	Year & Semester	L-T-P	Credits
20PIT2210	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:

Details of the 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	<ol style="list-style-type: none"> 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 $(ax^2+bx+c=0)$ as input and compute all possible roots
Control Flow	<ol style="list-style-type: none"> 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,

	<p>1/3, 1/4, . . . ,1/10</p> <p>17. Write a program using a for loop that loops over a sequence. What is sequence?</p> <p>18. Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.</p>
Data Structures	<p>19. Python program to check whether a string is Palindrome or not</p> <p>20. Python program to create list with n elements and find the average</p> <p>21. Python program to store n elements into a list, find the Average of the list excluding zero elements</p> <p>22. Python program to create list with n elements and find the largest number without using built-in functions</p> <p>23. Python program to count the numbers of characters in the string and store them in a dictionary data structure.</p> <p>24. Python program to create dictionary with key as unique element from Tuple and value as factors of the element</p> <p>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.</p> <p>26. Python program to create dictionary with key as unique element from Tuple and value as factors of the element</p>
Files	<p>27. Python program to find the longest word from the file</p> <p>28. Write a program to print each line of a file in reverse order.</p> <p>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</p> <p>30. Write a program to compute the number of characters, words and lines in a file.</p>
Functions	<p>31. Python Program to define function with primedigitproduct() to find prime digits product of a given number</p> <p>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.</p> <p>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)</p> <p>33. Find mean, median, mode for the given set of numbers in a list</p> <p>34. Write a function dups to find all duplicates in the list</p> <p>35. Write a function unique to find all the unique elements of a list.</p> <p>36. Write a function cumulative_product to compute cumulative product of a list of numbers.</p> <p>37. Write a function reverse to reverse a list. Without using the reverse function.</p> <p>38. Write function to compute gcd, lcm of two numbers</p>

Web resources:

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

Course Outcome:

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

Course Name	Course Code	Year & Semester	L-T-P	Credits
20PBE2201	Biology-IV	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

(09 Hours)

Genetics 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, Klinefelter's syndrome Turner's syndrome and Down's syndrome)

UNIT-II

(09 Hours)

Molecular Basis of Inheritance: 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

(06 Hours)

Biotechnology

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

UNIT-IV

(06 Hours)

Biotechnology and its Applications: Agriculture; Medicine: Human Insulin and Vaccine Production, Gene Therapy; Genetically Modified Organisms- Bt Crops; Transgenic Animals; Biosafety Issues– Biopiracy and Patents.

UNIT-V

(08 Hours)

Ecology

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%

Course Name	Course Code	Year & Semester	L-T-P	Credits
20PBE2210	Biology Lab-IV	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 strategies 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%
