VIGNAN'S
Foundation for Science, Technology & Research
(Deemed to be UNIVERSITY)
-Estd. u/s 3 of UGC Act 1956

C24 Curriculum & Course Contents

B.Tech. First Year (B)

w.e.f. batch 2024-28

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COURSE STRUCTURE – C24 (Bi. P. C stream)

Induction Programme

Course Title	L	T	P	C	Course category
Orientation Session	0	2	0	1	Binary grade

I Year I Semester

Course Title	L	T	P	C	Course category
Elementary Mathematics / Matrices and Differential Equations	3	2	0	4	Basic Sciences
Applied Physics / Organic Chemistry	3	0	2	4	Basic Sciences
Fundamentals of Electrical & Electronics Engineering/ Engineering Graphics	2	0	2	3	Basic Engineering
Programming in C	2	0	4	4	Basic Engineering
English Proficiency & Communication Skills (PET)	0	0	2	1	Humanities
IT Tools & Cyber security	0	2	2	2	Basic Engineering
Environmental Studies / Management Science	2	2	0	3	Basic Sciences / Humanities
	12	**6**	**12**	**21**	
Physical Fitness, Sports & Games / Self-empowerment & Gender Sensitization	0	0	2	1	Binary grade
Constitution of India / Indian Knowledge Systems	0	2	0	1	Binary grade
	0	**2**	**2**	**2**	
	34			**23**	

I Year II Semester

Course Title	L	T	P	C	Course category
Elementary Mathematics / Matrices & Differential Equations	3	2	0	4	Basic Sciences
Applied Physics / Organic Chemistry	3	0	2	4	Basic Sciences
Fundamentals of Electrical & Electronics Engineering/ Engineering Graphics	2	0	2	3	Basic Engineering
Problem Solving through Python	2	0	2	3	Basic Engineering
Technical English Communication	2	0	2	3	Humanities
Environmental Studies / Management Science	2	2	0	3	Basic Sciences / Humanities
	14	**4**	**8**	**20**	
Physical Fitness, Sports & Games / Self-empowerment & Gender Sensitization	0	2	0	1	Binary grade
Constitution of India / Indian Knowledge Systems	0	2	0	1	Binary grade
	0	**4**	**0**	**2**	
	30			**22**	

24MT103 ELEMENTARY MATHEMATICS

Hours per week:

L	T	P	C
3	2	0	4

PREREQUISITE KNOWLEDGE: Basics of Geometry and Algebra

COURSE DESCRIPTION AND OBJECTIVES:

The objective of the course is to make student acquainted with preliminary concepts of mathematics that are useful for their engineering study. Students will learn concepts of progression, partial fractions, straight line, tw3rigonometry, calculus which will help them to apply in various aspects of engineering fields.

MODULE-1

24L+16T+0P=40 Hours

UNIT-1: MATHEMATICAL PRELIMINARIES

Partial fractions; Arithmetic progressions, Geometric progressions.

UNIT-II: STRAIGHT LINES AND TRIGONOMETRIC RATIOS

Straight lines: Point in coordinate plane, distance formula, straight line, slope, equation of straight lines in different forms.

Trigonometric ratios: Trigonometric ratios, values in different quadrants, compound angles, multiple angles.

PRACTICES:

- Splitting a given improper fraction
- Finding the general term and sum of infinite terms of a progression.
- Finding equation of a straight line in various form
- Find the tangent and normal.
- Evaluation of trigonometric function.

MODULE-2

24L+16T+0P=40 Hours

UNIT I: CALCULUS

Differential Calculus: Introduction to differentiation, Derivatives of simple functions, Product rule, Quotient rule and Chain rule of differentiation.

Integral calculus:

Integration as anti-derivative process, Standard forms, Methods of integration: by substitution, by parts, and by partial fractions; Definite integration.

UNIT II: APPLICATIONS OF CALCULUS

Tangent, normal, velocity and acceleration; Evaluation of length and area by integration.

PRACTICES:

- To calculate the profit and loss in business using graphs.
- To check the temperature variation.
- To determine the speed or distance covered.
- Derivatives and integration are used to derive many equations in Physics.
- In the study of Seismology like to find the range of magnitudes of the earthquake.

SKILLS:

- Focusing on Trigonometric Ideas.
- Know the various trigonometric functions.
- Understanding the Applications of Trigonometry and straight lines.
- Understand basic applications of calculus.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply the concepts of straight line in real life problems.	Apply	1	1, 2, 9, 10, 12
2	Apply the concepts of calculus in real life problem	Apply	2	1, 2, 9, 10, 12
3	Distinguish between finite and infinite AP and determine the general term.	Analyse	1	1, 2, 9, 10, 12
4	Categorize right angle triangles to evaluate the trigonometric ratios.	Analyse	2	1, 2, 9, 10, 12

TEXT BOOKS:

1. John Bird, "Higher Engineering Mathematics", Routledge (Taylor & Francis Group), London, New York, 2018.
2. Veerajan, T., "Engineering Mathematics", Tata McGraw Hill Publishing Co., New Delhi, 3rd edition reprint,2017.

REFERENCE BOOKS:

1. Kandasamy P et. al., "Engineering Mathematics, Vol. I", 4th revised edition, S. Chand & Co., New Delhi,2016.
2. Narayanan S., Manicavachagom Pillay T.K., Ramanaiah G., "Advanced Mathematics for Engineering students, Volume I", 2nd edition, S. Viswanathan Printers and Publishers, 2000.
3. Venkataraman M. K., "Engineering Mathematics – First Year", 2nd edition, National Publishing Co., Chennai, 2000.

24MT104 MATRICES AND DIFFERENTIAL EQUATIONS

Hours per week:

L	T	P	C
3	2	0	4

PREREQUISITE KNOWLEDGE: School level Mathematics, Differentiation and Integration

COURSE DESCRIPTION AND OBJECTIVES:

This course will help the students to learn the concepts of matrices and differential equations. Also they can apply these concepts in any engineering and science domains.

MODULE-1

24L+16T+0P=40 Hours

UNIT I: MATRICES

Definition of matrix; Types of matrices; Algebra of matrices, adjoint of a matrix, inverse of a matrix by elementary operations, Rank of a matrix, Echelon form, Normal form.

UNIT II: APPLICATIONS OF MATRICES

Consistency of system of linear equations, Solution of system of linear equations by Gauss elimination method and Gauss Jordan method, LU factorization method, Gauss-seidal method, Relaxation method.

PRACTICES:

- Identify the matrix and do various operations on it.
- Finding rank of matrix.
- Solving a system of equation using matrix method
- Find Eigen values and Eigen vectors.

MODULE-2

24L+16T+0P=40 Hours

UNIT I: ORDINARY DIFFERENTIAL EQUATIONS

First Order Differential Equations: Introduction to ODE, variable separable method, homogenous and non-homogenous differential equations, linear differential equations, Bernoulli's equations.

Second Order Differential Equations: Linear Homogeneous and non-homogeneous differential equations with constant coefficients (RHS is e^{ax}, x^n, sin(ax) or cos(ax)).

UNIT II: APPLICATIONS OF ODE:

Applications of ODE: Newton's law of cooling, Law of natural growth and decay; LC circuit.

Numerical Methods to Solve ODE: Euler's Method, Improved Euler's Method, R.K. 4^{th} Order method.

PRACTICES:

- Finding Solutions of Differential Equations.
- Apply the concepts of Differential equations.
- Check the order and degree of an ODE.
- Find solution for any four ordinary differential equations by applying suitable method.
- Find numerical solution for any four ordinary differential equations by applying suitable method.
- Discuss some applications of ODE.

SKILLS:

- Apply row transformations on Matrices to reduce them into required form.
- Classify ODEs.
- Constitute a solution for ODE.
- Find analytical solution of a differential equation using appropriate method.
- Demonstrate any one numerical method to solve differential equation.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply elementary transformations to find the rank and inverse.	Apply	1	1, 2, 9, 10, 12
2	Solve the Ordinary differential equations.	Apply	2	1, 2, 9, 10, 12
3	Apply the differential equation in various problems.	Apply	2	1, 2, 9, 10, 12
4	Examine the consistency of the system of linear equations.	Analyse	1	1, 2, 9, 10, 12

TEXT BOOKS:

1. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44 Edition, 2018.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & Sons, Inc., 2017.

REFERENCE BOOKS:

1. N. P. Bali, K. L. Sai Prasad, A Textbook of Engineering Mathematics I, II, III, Universal Science Press, New Delhi, 2018, 2nd Edition.
2. H. K. Dass and Er. Rajanish Verma, "Higher Engineering Mathematics", S. Chand & Co., Third revised edition, 2015.
3. B. V. Ramana, "Advanced Engineering Mathematics", TMH Publishers, 2015.

24PY101 - APPLIED PHYSICS

Hours per week:

L	T	P	C
3	0	2	4

PREREQUISITE KNOWLEDGE: Basic concepts of wave optics. Atomic structure and fundamentals of crystal physics.

COURSE DESCRIPTION AND OBJECTIVES: The purpose of this course is to present the principles and concepts of light waves. It enunciates the concurrent understanding of lasers and optical fibers. It provides in-depth understanding of the crystal structure of the solids. It emphasizes on the principles and applications of nanomaterials as relevant to an engineer.

MODULE-1

24L+16T+0P=40 Hours

UNIT-1: PHYSICAL OPTICS

Interference:

Introduction, superposition principle, types of superposition of waves; Division of wave front and division of amplitude, Newton rings experiment, diameter of Newton rings (bright & dark), determination of wavelength and refractive index; Anti reflection coatings (Qualitative); LIDAR.

Diffraction:

Introduction, differences between interference and diffraction; Types of diffraction, Fraunhofer diffraction at single slit; Plane transmission diffraction grating (Qualitative), determination of wavelength; Dispersive power and resolving power, Rayleigh criteria of resolution; Optical microscope; Holography (Qualitative).

Polarization:

Introduction, polarized and unpolarized light; Production of plane polarized light; Nicol prism; Quarter and half wave plates.

UNIT-2: LASERS AND FIBRE OPTICS

Lasers:

Introduction, characteristics of laser light, spontaneous and stimulated emissions; Population inversion and pumping processes; He-Ne laser and semiconductor diode laser; Applications of lasers in medical field (LASIK surgery and Cancer treatment).

Fibre Optics:

Introduction, principle of optical fibers; Acceptance angle and numerical aperture; Types of optical fibers, step index fibers and graded index fibers; Applications of optical fibers (Endoscope and Biosensor).

EXPECTED PRACTICES:

- **Newton's rings:** Determination of wavelength of a given light source.
- **Diffraction grating:** Determination of wavelength of different colors of light.
- **Laser:** Determination of wavelength of a given diode laser source.
- **Optical fiber:** Determination of numerical aperture and acceptance of an optical fiber.

MODULE-2

24L+16T+0P=40 Hours

UNIT-1: INTRODUCTION TO CRYSTALLOGRAPHY

Crystal Physics:

Introduction, crystal systems; Packing factor for SC, BCC and FCC; Miller indices, rules to find Miller Indices, important features of Miller Indices; Distance of separation between successive (h k l) planes (Qualitative); X-ray diffraction (XRD) and Bragg's law, powder method; Protein crystallography (Qualitative).

UNIT-2: ELEMENTS OF NANOMATERIALS

Elements of Nanomaterials:

Introduction, principles of nanomaterials; Synthesis of nanomaterials, top- down and bottom-up approaches, Ball-Milling method, Sol-Gel method; Medical applications of nanomaterials.

Characterization of Nanomaterials:

Electron microscopy, scanning electron microscope (SEM), transmission electron microscope (TEM); Atomic force microscope (AFM).

EXPECTED PRACTICES:

- Energy band gap of nanomaterials (DRS method)
- Estimation of the structural parameters of a given sample using XRD
- **Solar cell:** Determination of efficiency and fill factor
- Synthesis of nanoparticles using Sol-Gel method.

SKILLS:

- Apply the dynamics of light to realize various potential applications in engineering.
- Evaluate the concepts of lasers and optical fibers to realize versatile applications in Science, Engineering and Technology.
- Analyze the crystal structures and orientation of planes.
- Demonstrate the synthesis and characterization of nanomaterials in view of their applications.

COURSE OUTCOMES:

Upon successful completion of the course, students will have the ability to:

CO No	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1.	Apply the concepts of physical optics in the perspective of engineering applications.	Apply	1	1, 3, 5, 10
2.	Analyze the wavelengths of laser for applications in medicine and to foster the knowledge on optical fibers to realize fiber optic sensors.	Analyze	1	1, 3, 5, 10
3.	Unravel of various crystal structures and their relevant applications in engineering.	Apply	2	1, 2, 4, 5, 10
4.	Connect the dimensions of nanoparticles to consolidate the physical and chemical aspects of nanomaterials.	Analyze	2	1, 2, 3, 4, 5, 7, 10

TEXT BOOKS:

1. A. K. Ghatak, ''Optics'', Tata McGraw Hill, 7th Edition, 2020.
2. C. Kittel, ''Introduction to Solid State Physics'', John Wiley, 8th Edition, 2012.
3 T. Pradeep, "A Text Book of Nanoscience and Nanotechnology", Tata McGraw Hill, 2012.

REFERENCE BOOKS:

1. D. Halliday, R. Resnick and J. Walker, "Fundamentals of Physics", John Wiley and Sons, 11th Edition 2018.
2. Shatendra Sharma and Jyotsna Sharma, "Engineering Physics", Pearson India Education Services Pvt. Ltd., 2018.
3. M.N.Avadhanulu, P.G.Kshirsagar and T.V.S. Aruen Murthy, "A Text Book of Engineering Physics", S. Chand & Company Ltd., 11th Edition 2019.
4. M. R. Srinivasan, "Engineering Physics", New Age International Publishers, 2nd Edition 2021.

24CT102 – ORGANIC CHEMISTRY

Hours per week:

L	T	P	C
3	0	2	4

PREREQUISITE KNOWLEDGE: Intermediate level knowledge of chemistry

COURSE DESCRIPTION AND OBJECTIVES:

This course is aimed at offering fundamental concepts of organic chemistry which will help to design and synthesize organic compounds and understand their properties. This course will make the student familiar with basic concepts of bonding, reaction intermediates and stereochemical aspects applicable in synthetic organic chemistry and organic materials. As a first-level course for B. Tech. students with biology background, it will be a strong basis to understand advanced level mechanistic aspects of biochemical reactions and also synthesis of organic molecules with medicinal value.

MODULE-1

24L+16T+0P=40 Hours

UNIT-1: CHEMICAL BONDING AND REACTION INTERMEDIATES

Chemical Bonding: Introduction to VBT and VSEPR theory, Molecular Orbital (MO), N_2, O_2, CO, energy diagram of Ethylene.

Reaction Intermediates: Bond fissions, arrow-pushing for drawing mechanism, formation and reactivity of carbanions, carbocations, free radicals, carbenes

UNIT-2: STEREOCHEMISTRY

Representations of 3-Dimensional structures; Structural isomers and Stereoisomers; Chirality, optical isomerism - Enantiomers and Diastereomers (Lactic acid and Tartaric acid); Absolute configurations (R/S); *cis-trans* isomerism, *E, Z* nomenclature, Conformational analysis – Ethane and Butane; Resolution methods.

PRACTICES:

- Determination of melting point of organic compounds
- Determination of boiling point of organic compounds.
- Separation of organic compounds by thin layer chromatography(TLC).
- Paper Chromatography for Identification of Amino acids from the mixture
- Synthesis of Racemic BINOL using solvent free methods.
- Aldol condensation.
- Relevance of stereochemistry in biology eg. Thalidomide.

MODULE-2

24L+16T+0P=40 Hours

UNIT-1: ORGANIC REACTIONS AND MECHANISM

Organic reactions: Mechanisms for substitution (SN_1 vs SN_2), addition (Electrophilic and Nucleophilic), Elimination (E_1 and E_2) reactions; Oxidation (Jones reagent, $KMnO_4$) and reduction ($LiAlH_4$, $NaBH_4$); Introduction to catalytic hydrogenation.

UNIT-2: STRUCTURAL ELUCIDATION OF ORGANIC COMPOUNDS

IR Spectroscopy: Introduction, principle, identification of functional groups.

NMR spectroscopy: Introduction, principle, chemical shift, ^{1}H-NMR (Ethyl alcohol and other simple molecules), *cis-trans* isomers (*J* values).

Mass spectroscopy: Introduction, principle, fragmentation of simple molecules (nitrogen rule).

PRACTICES:

- Preparation and characterization of Aspirin/Paracetamol using IR.
- Analysis and Characterization (IR) of Functional groups
    - Carboxylic acids/Carbonyl compounds/Amines
- Oxidation and of an Organic compound using Potassium Permanganate ($KMnO_4$)
- Reduction and of Aldehydes using Sodium Borohydride ($NaBH_4$)
- Steam distillation for extraction of essential oils.
- To Estimate the amount of glucose present in the given solution
- Qualitative analysis of Phytochemicals
    - Alkaloid/Flavonoids

SKILLS:

- Design a scheme for an organic reaction
- Identify the stereochemical feature of a molecules based on the structure
- Apply the R&D scale to Gram scale reaction
- Choose the desired green solvent required for a reaction
- Analyse the desired product, side product and impurities formed during the course of the reaction pathway

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply the theories of bonding to predict the formation and reactivity of different reaction intermediates in organic reactions.	Apply	1	1, 2, 9, 10, 11, 12
2	Identify the stereochemical features of organic molecules and their the importance of chirality with relevance to biological activity.	Analyse	1,	1, 2, 3, 6, 8, 9, 10, 11, 12
3	Analyse various synthetic reactions for preparation of drug molecules .	Analyse	1, 2	1, 2, 3, 6, 8, 9, 10, 11, 12
4	Verify the structure of organic compound using the principles of instrumental techniques for structure determination.	Evaluate	2	1, 2, 4, 5, 9, 10, 11,12

TEXT BOOKS:

1. Arun Bahl and B.S. Bahl, "Text Book to Organic Chemistry", 22nd Edition, S. Chand & Co, 2016.
2. R.T. Morrison, R.M. Boyd and S.K. Bhattacharjee, "Organic Chemistry", 7th edition, Pearson Publications, 2018.

REFERENCE BOOKS:

1. P. Bruice, Organic Chemistry, Pearson Scientific Publications, 8th Edition. 2020.
2. J. David Rawn and Robert Ouellette, "Organic Chemistry: Structure, Mechanism, Synthesis", 2nd edition, Academic Press, 2018.
3. Graham Patrick, "A Very Short Introduction to Organic Chemistry", Oxford Publishers, 2017.
4. D.L. Pavia, G.M. Lampman, G.S. Kriz, R.G. Engel, A microscale approach to Organic Laboratory Techniques, 6th addition, Brooks/Cole, 2017.
5. Silverstein, Robert M. Bassler, G. Clayton Morrill and C. Terence, "Spectroscopic Identification of Organic Compounds", 8th Edition, John Wiley & Sons Inc, 2014.
6. J. Mendham, R. C. Denney, J.D. Bares, M. Thomas and B. Siva Sankar, "Vogel's Text book of qualitative Chemical Analysis", Pearson Publications - Volume I, 2009.
7. I. L. Finar, "Organic Chemistry", Vol–I, 6th edition, Longman Scientific Publications, 2006.
8. Vogel's Practical Organic chemistry. 5th edition, Pearson India, 2003.

24CT103 – ENVIRONMENTAL STUDIES

Hours per week:

L	T	P	C
2	2	0	3

PREREQUISITE KNOWLEDGE: General awareness regarding environmental problems and importance of environmental protection.

COURSE DESCRIPTION AND OBJECTIVES:

It is a multidisciplinary subject where we deal with different aspects using a holistic approach. It is evolving to be the education for sustainable and ethical development both at a local and global level. It helps to prepare the next generation and to plan appropriate strategies for addressing environmental issues. It identifies and create solutions that conserve to manage ecosystem and biodiversity and also helps to eliminate pollutants, toxicants, preserve air, water and soil quality. Environmental education recognize impacts of global issues, enhances the public awareness and helps to take decisions towards environmentally responsible actions.

MODULE-1

16L+16T+0P=32 Hours

UNIT-1: Sustainable Development, Natural Resources and Ecosystems

Sustainable Developments - Concepts and SDGs; Natural Resources (forest, water, land), Energy Resources (Renewable and non-renewable resources); Global energy scenario; Concept of Ecology and Ecosystem, Ecological Succession, Population Ecology, Biotic Interactions.

UNIT-2: Biodiversity and Ecosystem conservation

Biodiversity, Threats to Biodiversity, Man environment interactions; Biodiversity conservation (*in-situ* and *ex-situ* conservation strategies); Protected areas, Traditional Knowledge in biodiversity conservation, Ecosystem protection.

PRACTICES AND FIELD PROJECTS:

- Visit to biogas plant, solar power plant, waste to energy power plant (document preparation)
- Detailed study of any environmental problem/situation, Identification of factors pertaining to that problem with conclusion (Students can choose any environmental problem in the surrounding. (document preparation)
- Field project**:** river/pond/lake/forest/grassland/hill/mountain ecosystem study and report writing.
- Herbarium Sheet preparation
- Preparation of Compost
- Activity on Renewable Energy Resource Research

MODULE-2

16L+16T+0P=32 Hours

UNIT-1 Pollution Control and Environmental Sanitation

Emerging Local and Global Environmental Issues; Environmental Pollution Control Monitoring, Strategies and devices in industries; Clean technologies; Waste Management-Municipal, Industrial, Biomedical, Hazardous, Radioactive Waste, and E-waste management; Waste-water Treatment (Water Purification Technologies, Adsorption Studies).

UNIT-2 Environmental Health and Safety

Occupational Health and Hygiene; Toxicity Studies (Heavy Metal Toxicity, Xenobiotic and Carcinogenicity, Effects on Human health by Agents like Asbestos, Tobacco etc.); Bioremediation Technologies.

PRACTICES AND FIELD PROJECTS

- Field Project: Water and Waste-water analysis and Remediation techniques, Visit to Sewage Treatment Plant.
- Field Project: Assessment of Plastic Pollution on Campus and nearby Places with Possible Remediation Strategies
- Disposal of laboratory waste- Individual Practice and Report Writing, Lab Safety Awareness
- Report Writing: 12 principles of Green Chemistry for Environmental Sustainability
- Report Writing: Environmental Management (ISO 14001), Eco-mark, Eco labeling
- Lab Safety and Local Disaster Management Plan

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with Pos
1	Ability to apply knowledge, research skills and field techniques to protect environment.	Apply	1	6,7,12
2	Analyze the biodiversity of different ecosystems and formulate various conservation approaches	Analyze	1	7,8,10,12
3	Collect the data using research skills and analyze the presence of various environmental pollutants for problem solving	Analyze	2	6,7,12
4	Design and apply remediation technologies for environmental sustainability	Apply	2	3,6,7,9,12
5	Survey of various waste management approaches and recommend their implementation strategies	Evaluate	2	7,8,9,10,12

TEXT BOOKS:

1. A. Kaushik and C. P. Kaushik, “Perspectives in Environmental Studies”, 7th edition, New Age International Publishers, 2021.
2. B. Joseph, “Environmental Studies”, 3rd edition, McGraw Hill Education, 2017.

REFERENCE BOOKS:

1. Mahua Basu & S.Xavier, "Fundamentals of Environmental Studies", Cambridge University Press, 2017.
2. Sanjay K. Sharma, Ackmez Mudhoo, "Green Chemistry for Environmental Sustainability", CRC Press, 2019.
3. Ram Chandra, "Environmental Waste Management,"CRC Press, 2020.
4. Srujana Kathi, "Environmental Toxicoloy", Notion Press, 2021.
5. James E. Girard, "Principles of Environmental chemistry", 2nd edition, Jones and Bartlett Publishers, 2009.

24EE102- FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Hours Per Week:

L	T	P	C
2	0	2	3

PREREQUISITE KNOWLEDGE: Electrostatics and Electromagnetism.

COURSE DESCRIPTION AND OBJECTIVES:

This course provides an insight into the functioning of basic electrical components like resistor, inductor and capacitor. It deals with the constructional and operational details of static machines. It also deals with the basic electronic components like P-N junction diode, Zener diode.

MODULE-1

16L+0T+16P=32 Hours

UNIT-1

Trigonometric Functions: Introduction to basic trigonometric functions

Vectors: Introduction to vectors and their representation, Vector addition, subtraction and Multiplication.

Phasors: Phasor representation of sinusoidal voltage and current signals, Conversion of Polar to Rectangular form and Vice versa. Phasor diagrams and their interpretation. Phasor addition subtraction, and multiplication. Conversion between phasor and time-domain representations.

Differentiation, Integration, and Applications: Basic concepts of calculus, Differentiation: Rates of change, derivatives of basic functions, Integration: Finding areas under curves, indefinite and definite integrals.

UNIT-2

FUNDAMENTALS OF ELECTRIC CIRCUITS:

Terminal characteristics of Active Elements (Ideal voltage, current source) and passive elements (Resistor, Inductor and Capacitor), Ohm's Law, Kirchhoff's Laws, Series and parallel circuits, Voltage and current division, Power and energy calculations, calculating areas of waveforms, finding total charge, energy and Power, Introduction to circuit analysis techniques (Mesh and nodal analysis).

AC circuits: Generation of AC voltage, Frequency, Average value, R.M.S. value, Form factor, Peak factor for sinusoidal only.

PRACTICES:

- Verification of Ohm's law.
- Verification of Kirchhoff's current law.
- Verification of Kirchhoff's voltage law.
- Measurement of power and Energy in resistive circuit.

MODULE-2

16L+0T+16P=32 Hours

UNIT-1

ANALYSIS OF AC CIRCUITS AND TRANSFORMER

Generation of AC voltage, Frequency, Average value, R.M.S. value, Form factor, Peak factor for sinusoidal only; Analysis of single- phase ac circuits consisting of R, L, C, RL, RC (series and parallel), faradays law of electromagnetic induction, Principle of operation of single phase transformer, Constructional features, EMF equation (simple numerical problems).

UNIT-2

SEMICONDUCTOR DEVICES

Classification of semiconductors, P-N junction diode -operation and its characteristics, Half wave rectifier - operation, efficiency; Full wave rectifiers -types, operation, efficiency; Zener diode and its characteristics, Zener diode as Voltage regulator.

PRACTICES:

- Determination of R.M.S. Values of sinusoidal waveform.
- Verification of PN junction diode characteristics under both forward and reverse bias.
- Verification of Zener diode characteristics under reverse bias.
- Transformation ratio of a single phase transformer at different loads.
- Determination of impedance in complex AC circuits.

SKILLS:

- Distinguish between linear and nonlinear elements by looking at VI characteristics
- Develop a simple loop generator.
- Design a voltage regulator using Zener diode.
- Design a half wave rectifier using PN junction diode.
- Design a full wave rectifier using PN junction diodes.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Solve the AC (single and three phase) and DC circuits using different methods.	Apply	1, 2	1, 2, 9 ,12
2	Analyze the resistive circuits with independent sources and find its solution..	Analyze	1, 2	1, 2, 6, 9
3	Examine the different electrical equipment.	Evaluate	2	1, 2, 9, 12
4	Acquire the knowledge of semiconductor devices to create circuits.	Create	1	1, 2, 3, 9, 12

TEXT BOOKS:

1. V. K. Mehta, "Principles of Electrical Engineering and Electronics", 1st edition, S.Chand & Co., Publications, New Delhi, 2019.
2. D.P. Kothari, "Basic Electrical and Electronics Engineering", 2nd edition, TMH, New Delhi, 2017.
3. Anthony Croft and Robert Davison, "Mathematics for Engineers: A Modern Interactive Approach," Pearson/Prentice Hall, 2008.

REFERENCE BOOKS:

1. Millman and Halkias, "Electronic Devices and Circuits", Mc Graw Hill, 2006.
2. A.K. Thereja and B.L.Thereja, "Electrical Technology", Vol.–II, S. Chand & Co., Publications, 2020.
3. U. Bakshi and A. Bakshi, "Basic Electrical Engineering", 1st edition, Technical Publications, Pune, Nov 2020.

24ME101 - ENGINEERING GRAPHICS

Hours per week:

L	T	P	C
2	0	2	3

PREREQUISITE KNOWLEDGE: Basics of Geometry.

COURSE DESCRIPTION AND OBJECTIVES:
Engineering graphics is the language of engineers and is the most effective way of communicating and sharing technical ideas in the form of pictures/drawings. The objective of this course is to familiarize the students with the conventional concepts of engineering drawing and computer aided drawing.

MODULE-1

16L+0T+16P=32 Hours

UNIT-1

ENGINEERING CURVES
Types of lines; Lettering, Dimensioning, Geometric constructions - lines, polygons (Angle, ARC, General and Inscribe in circle method), Conical curves (General method), Ellipse by Oblong method.

UNIT-2

ORTHOGRAPHIC PROJECTIONS OF POINTS, LINES & PLANES
Principles of projection; Projections of points; Projection of straight lines - Inclined to one plane, inclined to both planes; Projection of planes - Inclined to one plane.

PRACTICES:

- Construction of polygons using different methods (i.e. ARC, Angle, General).
- Inscribe a regular hexagon & pentagon in a circle of the given diameter.
- Tracing of conical curves (Ellipse, Parabola, Hyperbola) by using General Method.
- Draw the projections of the points situated in all the 4 quadrants.
- Draw the projections of a line when it is inclined to one plane (HP or VP).
- Draw the projections of a line when it is inclined to both the planes (HP &VP).
- Draw the projections of a plane when it is inclined to one plane (HP or VP).

MODULE-2

16L+0T+16P=32 Hours

UNIT-1

PROJECTIONS OF SOLIDS
Projection of solids axis inclined to one reference plane - Prisms, pyramids, Cylinder and cone.

DEVELOPMENT OF SURFACES
Development of lateral surfaces of simple solids - Prisms, Pyramids, Cylinder and cone.

UNIT-2

ORTHOGRAPHIC VIEWS

Conversion of pictorial views into orthographic views.

Drafting Using Computer Package: Introduction to 2D modelling software - AutoCAD; Conversion of Isometric view into Orthographic views of simple castings; Conversion of Orthographic views into Isometric view of simple solids - Prisms, Pyramids, Cylinders and cones.

PRACTICES:

- Draw the projections of Prisms, when they are inclined to one reference plane (HP or VP).
- Draw the projections of Pyramids, when they are inclined to one reference plane (HP or VP).
- Draw the projections of cylinder & cone, when they are inclined to one reference plane (HP or VP).
- Draw the complete surface development of prisms & pyramids with the given dimensions.
- Draw the complete surface development of cylinder & cone with the given dimensions.
- Draw the orthographic view's (i. e. front view, top view, and side view) of the given pictorial view of the sketches by using AutoCAD.
- Draw the Isometric view of simple solids (Prisms & Pyramids) by using AutoCAD.
- Draw the Isometric view of simple solids (Cylinder & Cone) by using AutoCAD.

SKILLS:

- Convert isometric views of objects into orthographic views and vice versa.
- Visualize the shape of the 3D components.
- Create pictorial views by using AutoCAD
- Know projections by visualization.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Communicate the technical ideas in the form of drawings.	Apply	1	1,2,3,5
2	Apply the drawing skills in representing various geometrical features.	Apply	1	1,2,3,5
3	Develop orthographic projections and isometric views of various objects.	Apply	1	1,2,3,5
4	Estimate the lateral surface area of regular geometrical solids.	Analyze		1,2,3,5
5	Sketch simple objects and their pictorial views using AutoCAD.	Analyze	2	1,2,3,5

TEXT BOOKS:

1. J Hole, “Engineering Drawing”, Tata McGraw-Hill, 2nd Edition, 2019.
2. N D Bhatt, “Engineering Drawing”, Charotar Publication, 53rd Edition, 2014.

REFERENCE BOOKS:

1. Basant Agrawal and C.M. Agrawal “Engineering Drawing”, , Tata Mc Graw- Hill, 2nd Edition2018.
2. K L Narayana, “Engineering drawing”, SciTech Publications, 3rd Edition, 2011.
3. Colin H. Simmons, Dennis E. Maguire, Manual of Engineering Drawing, 2nd Edition, 2003.

24CY101 - IT TOOLS AND CYBER SECURITY

Hours per week:

L	T	P	C
0	2	2	2

PREREQUISITE KNOWLEDGE: Nil

(OBJECTIVE:) COURSE DESCRIPTION AND OBJECTIVES.

The coursework will introduce cyber security concepts and provide awareness about cybercrimes and preventive measures and safe practices to be followed. quantum physics concepts and their applications in quantum computing. It also familiarizes students with the to learn and practice the usage of software tools such as word, excel, ppt and LaTex, text and image editors.

MODULE-1

0L+16T+16P=16 hours

UNIT-I

Practicing exercises using software tools:

- Write a passage in a Word document. Give the passage a title, then format it according to the guidelines below:
  - Add the time and date, and make sure the title is bold, italicized, and underlined.
  - Increase the font size, style, and line spacing by two-fold.
  - Set the margins to 1.75 on the right and 1.5 on the left.
  - Set a border for the passage.
- Create a timetable using Table format of Word for your programme
- Preparation of resume
- Preparation of calendar for the current month
- Create an invitation for your department function or college day using the text box and other options
- Create a call letter for an interview using mail merge.
- Create value-added webpages about course curriculum using Hyperlink, styles, layout etc
- In Excel, create a student mark statement and determine the total, average, and percentage of marks
- Create a payroll system in Excel for 5 employees given Basic salary, 40% for D.A;12% for HRA; 10% for TA; 10% for CCA; 12% for PF; IT 10%. Calculate the gross and net salary
- Create a pivot table to analyse your worksheet data.

UNIT-II

Practicing exercises using software tools:

- Prepare a presentation on your university using PowerPoint.
- Prepare a presentation on launch of a product.
- Prepare a brochure of a value added course
- Create a hierarchy chart of your organization
- Design a Magazine cover.
- Design a poster inviting all students of your department Festival.
- Installation and demonstration of LaTeX.
- Prepare professional pdf documents using LaTeX.
- Prepare LaTex document containing mathematical equations, tables and images.

MODULE-2

0L+16T+16P=16 hours

UNIT-I

Introduction to Cyber security and Cybercrimes: Defining Cyberspace, Issues and challenges of cyber security, Cyber Hygiene, Classification of cybercrimes, Common cybercrimes targeting computers and mobiles, cyber-crime against women and children, social engineering attacks, reporting of cyber-crimes, Remedial and mitigation measures, Legal perspective of cyber-crime, IT Act 2000.

Social Media Overview and Security: Types of Social media platforms, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Best practices for the use of Social media.

UNIT-II

E-Commerce and Digital Payments: Main components of E-Commerce, Elements of E-Commerce security, E-Commerce threats, E-Commerce security best practices. Modes of digital payments, Digital payments related common frauds and preventive measures.

Device Security: End Point device and Mobile phone security, Password policy, Security patch management, Importance of regular data backups, Downloading and management of third party software, Device security policy, Significance of host firewall and Ant-virus, Management of host firewall and Anti-virus, Wi-Fi security, Configuration of basic security policy and permissions.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Create word documents, presentations and spread sheets by applying various tools.	Apply	1	2, 5
2	Usage of latex tool for report writing	Apply	2	5, 6
3	Apply the concept of Cyber security, issues and challenges associated with it, cyber-crimes, their nature, legal remedies and the process of reporting crimes and best practices to be taken up in the usage of social media.	Apply	1	6, 8
4	Apply the basic concepts related to E-Commerce, digital payments, RBI guidelines and preventive measures against digital payment frauds.	Apply	2	6, 12
5	Use basic tools and technologies to protect their devices.	Apply	2	6

SKILLS:

- Integration of various components of a computer system.
- Trouble shooting of components of a computer system.
- Installation of OS and its various tools/ applications.
- Usage of IT tools such as MSWord, LaTex etc.
- Creating the documents using MS-Word and LaTex.
- Analysing and visualizing data with excel.
- Developing vari- ous power point presentations.

TEXT BOOKS:

1. Fundamentals of Computers by Reema Thareja, Oxford University Press 2nd edition 2019, India.
2. Lamport, Leslie (1994). LaTeX: A Document Preparation System, User's Guide and Reference Manual (2nd ed.). Pearson
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd.

REFERENCE BOOKS:

1. Information Warfare and Security by Dorothy F. Denning, Addison Wesley.
2. John Walkenbach, Herb Tyson, Michael R.Groh and FaitheWempen, "Microsoft Office 2010 Bible", Wiley.

24CS101-PROGRAMMING IN C

Hours per week:

L	T	P	C
2	0	4	4

PREREQUISITE KNOWLEDGE: Fundamentals of Problem Solving

COURSE DESCRIPTION AND OBJECTIVES:

This course is aimed to impart knowledge on basic concepts of C programming language and problem solving through programming. It covers basic structure of C program, data types, operators, decision making statements, loops, functions, strings, pointers, structures and unions. At the end of this course, students will be able to design, implement, test and debug complex problems using features of C.

MODULE- 1

16L+0T+32P=48 Hours

UNIT-1

INTRODUCTION TO ALGORITHMS AND PROGRAMMING LANGUAGES

Introduction to Algorithms: Introduction to computational thinking – Problem solving with algorithms and Flowcharts-Introduction to C: Structure of a C program - pre-processor statement, inline comments, variable declaration statements, executable statements; C Tokens - C character set, identifiers and keywords, type qualifiers, type modifiers, variables, constants, punctuations and operators.

Data Types and Operators: Basic data types; Formatted I/O; Reading and writing characters; Operators - assignment, arithmetic, relational, logical, bitwise, ternary, address, indirection, size of, dot, arrow, parentheses operators; Expressions - operator precedence, associative rules.

Control Statements: Introduction to category of control statements; Conditional branching statements - if, if– else, nested-if, if – else ladder, switch case;

Iterative statements - for, while, do - while, nested loops; **Jump statements** - break, jump, go to and continue.

UNIT-2

FUNCTIONS& POINTERS

User-defined functions: Function declaration - definition, header of a function, body of a function, function invocation; Call by value, Call by address. Recursion; Library Functions; Storage classes; Scope of a variable.

Pointers: Declaration, Initialization, Multiple indirection, Pointer arithmetic.

PRACTICES:

Questions on Data Handling

- Write a program to accept a number as input from the user which denotes the temperature in Celsius, convert it to Fahrenheit reading and print it
- Write a C program to find maximum between two numbers using conditional operator.
- Write a C program to find maximum between three numbers using conditional operator.

Questions on Decision Making

- Write a program to accept two numbers as input and print the greater of the 2 numbers
- Write a program to accept 3 numbers as input and print the maximum of the 3
- Write a program to accept a number as input and check if it is positive, negative or zero.
- Write a C program to check whether a year is leap year or not.
- Write a C program to find all roots of a quadratic equation.
- Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following:

  Percentage >= 90% : Grade A

  Percentage >= 80% : Grade B

  Percentage >= 70% : Grade C

  Percentage >= 60% : Grade D

  Percentage >= 40% : Grade E

  Percentage < 40% : Grade F

Questions on Loops

- Write a program to accept a number as input print the sum of its digits
- Write a program to accept a number as input, reverse the number and print it
- Write a program to accept a number as input and check if it is an Armstrong number
- Write a program to accept a number as input and check if the prime number or not.
- Write a program to accept 2 numbers as input and find their LCM
- Write a program to accept a number as input and check if it is a palindrome
- Write a program to accept 2 numbers as input and print their HCF
- Write a program to accept a number as input and check if a number is strong number or not.
- Write a program to generate prime numbers between two intervals given as input
- Write a program to accept a number N as input from the user and print the following pattern. Sample N = 5.

  1

  12

  123

  1234

  12345

- Write a program to accept a number N as input from the user and print the following pattern. Sample N = 5.

  A

  AB

  ABC

  ABCD

  ABCDE

Questions on switch statement

- Write a C program print total number of days in a month using switch case.
- Write a C program to create Simple Calculator using switch case.

Questions on functions

- Write a C program to check whether a number is prime number or not using a function.
- Write a C program to check whether a number is an Armstrong number using a function.
- Write a C program to check whether a number is a perfect number using a function.
- Write a C program to swap two numbers using pointers.
- Write a program that finds and returns the sum, largest and average of three integer numbers using a function and pointers.
- Write a C program to find factorial of any number using recursion.
- Write a C program to generate nth Fibonacci term using recursion.
- Write a C program to find GCD (HCF) of two numbers using recursion.

MODULE-2

16L+0T+32P=48 Hours

UNIT-1

ARRAYS & STRINGS

Arrays: Introduction; Types of arrays; Single dimensional array - declaration, initialization, usage, reading, writing, accessing, memory representation, operations; Multidimensional arrays. Passing arrays to functions; Relationship between arrays and pointers, Scaling up - array of arrays, array of pointers, pointer to a pointer and pointer to an array; Dynamic memory allocation functions – Creating arrays dynamically and performing operations on them.

Strings: Character array, Reading strings from the standard input device, displaying strings on the standard output device, Importance of terminating a string, Standard string library functions.

UNIT-2

STRUCTURES, UNIONS &FILES

Structures: Defining a structure, declaring structure variable, Operations on structures, Pointers to structure - declaring pointer to a structure, accessing structure members using pointer; Array of structures, Nested structures, passing structures to functions - passing each member of a structure as a separate argument, passing structure variable by value, passing structure variable by reference/ address; Typedef and structures.

Unions: Defining a union - declaring union variable, operations on union;

Files: Introduction to files, Streams, I/O using streams – opening a stream, closing stream; Character input, Character output, File position indicator, End of file and errors, Line input and line output, Formatted I/O, Block input and output.

PRACTICES:

Questions on 1-D Arrays

- Print the contents of an array from the left to the right
- Print the contents of an array from the right to the left

- Find the maximum and minimum elements in an unsorted array
- Sort a given list of numbers in ascending order.
- Replace every element in an array with the sum of its every other element
- Reverse the elements of an array (in place replacement)
- Write a program to find the second largest and smallest elements in an unsorted array

Questions on Strings

- Implement the string length function
- Implement the string copy function
- Implement the string concatenate function
- Implement the string compare function
- Implement the count words function
- Implement the string reverse function
- Write a program to accept a string as input and check if it is a palindrome
- Implement the strstr function.
- Write a program to print the character in the string with the count where count is the occurrence of the character
- Write a program to remove the duplicate characters in the given string

Questions on 2-D Arrays

- Print the contents of a 2D array in a zig-zag order
- Print the contents of a 2D array diagonal-wise
- Print the contents of a 2D array in the lower triangular order
- Find and print the maximum and minimum elements of each row of a matrix
- Write a program to find the sum of two matrices.
- Write a program that finds the product of two matrices.
- Write a program to find the transpose of a given matrix.

Questions on Files, Structures & Unions:

- Ramesh wants to do addition on complex numbers. He did it with regular practice but Charan asked him to do with the help of structures by following below Criteria.
  Write a C program that defines a structure named 'Complex' consisting of two floating point members called "real and imaginary". Let c1 and c2 are two Complex variables; compute the sum of two variables.

  Example:
  c1= 2 8
  c2= 6 4
  Sum= 8.000000+12.000000i
- Write a C program to accept details of 'n' employee (eno, ename, salary) and display the details of employee having highest salary. Use array of structure.
- Write a C program that creates a student file containing {Roll No, Student Name, Address, Stream}, where the data will be inserted and display the list of students who are in CSE (Stream=CSE).

  Input: A file name
  Output: The attributes such as Roll_No, Student_Name, Stream, Address.
  Sample Input
  201fa4200 Raja CSE Guntur
  201fa4201 Bala IT Tenali

Sample Output

201fa4200 Raja CSE Guntur

- Write a C program that reads content from an existing text file and write the same in a new file by changing all lowercase alphabetic character to upper case. (Existing file may contain digit and special characters).

  Example:
  Input: Enter the file name.
  Output: New file with updated content
- Write a C program to count the occurrences of the given string in a file.

  Example:
  Input: Enter the File name to read the string to be counted.
  Output: Display the count of occurrences of the string.

SKILLS:

- Analysis of the problem to be solved.
- Select static or dynamic data structures for a given problem and manipulation of data items.
- Application of various file operations effectively in solving real world problems.
- Develop C programs that are understandable, debug gable, maintainable and more likely to work correctly in the first attempt

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

No.	Course Outcome	Blooms Level	Module No.	Mapping with POs
1	Identify suitable data type for operands and design of expressions having right precedence	Apply	1,2	1
2	Apply decision making and iterative features of C Programming language effectively	Apply	1,2	1
3	Select problem specific data structures and suitable accessing methods	Analyze	1,2	1,2
4	Design and develop non- recursive and recursive functions and their usage to build large modular programs and also able to design string manipulation functions	Create	1,2	3
5	Develop C programs that are understandable, debuggable, maintainable and more likely to work correctly in the first attempt	Evaluate	1,2	3,4

TEXT BOOKS:

1. Behrouz A. Forouzan, Richard F.Gilberg, "Programming for Problem Solving", 1st edition, Cengage publications, 2019.
2. Ajay Mittal, "Programming in C - A Practical Approach", 1st edition, Pearson Education, India, 2010.

REFERENCE BOOKS:

1. Reema Thareja, "Computer Fundamentals and Programming in C", 1st edition, Oxford University Press, India, 2013.
2. Herbert Schildt, "C: The Complete Reference", 4th edition, Tata McGraw-Hill, 2017.
3. Byron S Gottfried, "Programming with C", 4th edition, Tata McGraw-Hill, 2018.

24CS102– PROBLEM SOLVING THROUGH PYTHON

Hours per week

L	T	P	C
2	0	2	3

PREREQUISITE KNOWLEDGE: Prior knowledge of any programming language and object-orientedconcepts is helpful but not mandatory.

COURSE DESCRIPTION AND OBJECTIVES:

This course offers sufficient knowledge required to understand the fundamental concepts of Python programming language. This course enables students to choose appropriate data structures (lists, dictionaries, tuples, sets, strings) for the given problem. In addition, the students will be able to createreliable, modular and reusable applications using Object- Oriented Programming approaches. At the end they will get an idea of how to access database using python programming, develop web applications, and using web Services using python Programming.

MODULE-1

16L+0T+16P=32 Hours

UNIT-1

INTRODUCTION

Introduction to python, Variables, Assignment, Keywords, Built-in functions, Indentation, Comments, Basic data types - integers, float, complex, Boolean, strings; Python program development, running python using REPL shell, Python scripts.

Operators and Expressions: Operators- arithmetic operators, comparison (relational) operators, assignment operators, logical operators, bitwise operators, membership operators, identity operators;Expressions and order of evaluations.

Control Structures: Conditional control structures - if, else if, else; Loop control structures - for, while, for... else, while…else, nested loops, break, continue, pass.

UNIT-2

PYTHON DATA STRUCTURES AND FUNCTIONS

Data Structures: Lists, Tuples, Sets, Strings, Dictionary - creation, accessing, basic operators and methods; List comprehensions.

Functions: Defining functions, calling functions, Passing arguments - keyword arguments, default arguments, positional arguments, variable-length arguments; Types of functions- anonymous functions,fruitful function, recursive functions; Scope of the variables- global and local variables, Development ofrecursive and non-recursive functions.

PRACTICES:

- Given two integers N1 and N2, write a program to find their product without using multiplication (‘*’) operator and loops.
- Given two integers N1 and N2 having same value, write a program to check whether N1 and N2 points to the same object or not.
- Given an Integer N, write a program to check whether given number is even or odd

without using modulus operator.

- Given coordinates of centre of a circle, radius and a point coordinate, write a program to check whether the given point lies inside or on the circle, or outside the circle.
- Print the Nth prime number. you need to find the Nth prime number, where n is given by user
  prime numbers: 2, 3, 5, 7, 11, 13 ...
  if n = 3 then prime = 5
  Sample Input: 3
  Sample Output: 5
- Write a program to find the sum of digits in a given integer.
- Given an integer N as an input, decides the geometrical figure for which the area has to be calculated, for example N=1 for circle, N=2 for rectangle, and N=3 for triangle. Write a program to display the area of the respective figure.
- Given an integer amount X, write a program to find the minimum number of currency notes $ (500, 100, 50, 20, 10, 5, 2, 1) required for the given amount.
  Input:
  575
  Where input is the amount for which we have to calculate the number of currency notes.
  Output: 4
  Explanation: Total amount = 1(500-dollar note) + 1(50-dollar note) + 1(20-dollar note) + 1(5-dollar note) = 575, hence the minimum number of notes required is 4.
- Given a list L of N numbers (integers), Write a program to find the sum of the elements of given list L with the corresponding elements of the reverse of list L. If list L has elements [1,2,3], then reverse of the list L will be [3,2,1] and the resultant list should be [4,4,4].
- Given a positive integer number n. Write a program to generates a dictionary d which contains (i, i*i*i) such that i is the key and i*i*i is its value, where i is from 1 to n (both included). Print the content of the dictionary d.
- Write a program to create a data structure to store student information such as regd no, name, percentage of marks, phone number and display the student details based on the order of percentage of marks.
- For a Given a string, design and implement functions to perform the following:
  a) remove vowels in the given string.
  b) count number of uppercase and lowercase letters.
  c) remove all special characters.
  d) check whether it is a palindrome or not.
  e) swap case of each letter.
- Create a function that receives 3 numbers and returns the median, i.e. the number that is not the min and not the max, but the one in between.
- Given two lists of integer numbers, write a function to perform the following operations.
  a. print elements that are common in both the lists. (Print without duplicates).
  b. print elements that are present in the first list and not present in second list.
  c. print elements that contain the first element of the first list and last element of the second list.
  d. print largest number of both the lists.
  e. print smallest number of both the lists.

- Create a function to find Common Elements in Two Lists Using Sets
- Implement a program to calculate GCD using recursive functions.
- Given two non-negative integers num1 and num2 represented as strings, return the product of num1 and num2, also represented as a string.
  Input: num1 = "2", num2 = "3"
  Output: "6"
- Create a Python function that rotates a list by a specified number of positions to the right. For instance, if the list is [1, 2, 3, 4, 5] and the rotation count is 2, the resulting list should be [4, 5, 1, 2, 3].
  Example:

  Input: [1, 2, 3, 4, 5], 2
  Output: [4, 5, 1, 2, 3]

  Input: [1, 2, 3, 4, 5], -1
  Output: [2, 3, 4, 5, 1]

  Input: ['a', 'b', 'c', 'd'], 3
  Output: ['b', 'c', 'd', 'a']

MODULE-2

16L+0T+16P=32 Hours

UNIT-1

MODULES, PACKAGES AND OOPS

Creating modules, Import Statement, From...Import Statement, Name Spacing, Creating user definedmodules.

Standard Modules: sys, math, date, time, os, random and itertools modules.

Packages: Package Initialization, Importing * From a Package, Sub packages.
Object Oriented Programming: Classes and Objects, Attributes and Methods, Constructors and Destructors- (__init__and__del__methods), Encapsulation - bundling of data and methods within a class, promotes data integrity and prevents unauthorized access, use of access modifiers to control access to attributes and methods; Inheritance, Method Overriding, Polymorphism, Abstraction, Class and Instance Variables - Differentiate between class variables (shared among all instances) and instance variables (unique to each instance), Access Modifiers-access modifiers and their role in controlling access to class members. **Operator Overloading:** customization of operators for user- defined classes- define methods such as add,_sub,_mul_, etc.

UNIT-2

ERRORS AND EXCEPTIONS AND FILES

Introduction to Exceptions, Handling Exception, Try Except Else and Finally Block, Raising Exceptions.

File Processing: Reading and writing files -creating a new file, writing to a file, reading text files, openingand closing files, reading, writing, tell (), seek (), rename ().

PRACTICES:

- Program that defines a function large in a module which will be used to find larger of two values and called from code in another module
- Write a program to find the number of lines, words and characters in the file.
- Write a program to append the data to an already existing file.
- Write a program that reads a file line by line. Each line read from the file is copied to another file with line numbers specified at the beginning of the line.
- Define the following functions that are more robust to erroneous input data
  a) To divide two numbers (To handle Zero Division Error).
  b) To read two integer numbers and display them (To handle Value Error).
  c) To display elements of a list (To handle Index Error).
  d) To open a file and display file contents (To handle File Not Found Error).
- Write a python program to handle multiple exceptions using raise keyword.
- Write a program that uses class to store the name and marks of students. Use list to store the marks in 3 subjects
- Write a program with class Employee that keeps a track of the number of employees in an organization and also stores and display their name, designation and salary details.
- Write a program that has classes such as Student, Course and Department. Enroll a student in a course of a particular department
- Write a program that has an abstract class Polygon. Derive two classes Rectangle and Triangle from Polygon and write methods to get the details of their dimensions and hence calculate the area.
- Write a Program that overloads the + operator on a class Student that has attributes name and marks
- Write a Program to overload the - operator to subtract two Distance objects.
- Write a program to overload the * operator to multiply two complex numbers

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Analyze various features of programming language and their application in problem solving in computer programming to write, compile, and debug programs in python language.	Analyze	1	1, 2
2	Make use of different data types to design programs involving decisions, loops, and functions.	Apply	1	1, 2, 5
3	Analyze the usage of different data structures for practical and contemporary applications for a given problem.	Analyze	1	1, 2, 3, 5
4	Choose appropriate programming paradigms, interrupt and handle exceptions using files to propose solution through reusable modules	Apply	2	1, 2, 3,5
5	Develop applications for a range of problems using object-orientedprogramming techniques.	Apply	2	1, 2,3,4,5

TEXT BOOKS:

1. Kenneth A. Lambert, "The Fundamentals of Python: First Programs", Cengage Learning, 2011.
2. Mark Lutz, "Learning Python", 5th edition, Orielly Publishers, 2013.
3. Reema Thareja, 'Python Programming using problem solving approach", oxford university press,2017

REFERENCE BOOKS:

1. Introduction to Computation and Programming Using Python. John V. Guttag, The MIT Press.
2. James Payne, "Beginning Python using Python 2.6 and Python 3", Wrox publishing.
3. Paul Gries, "Practical Programming: An Introduction to Computer Science using Python 3",The Pragmatic Bookshelf, 2nd edition, 4 Oct. 2013.
4. Allen B. Downey, "Think Python", 1st edition, Orielly publishing.

24EN101 – ENGLISH PROFICIENCY AND COMMUNICATION SKILLS

Hours per week

L	T	P	C
0	0	2	1

PREREQUISITE KNOWLEDGE: Basics of grammar, Read and understand for global context, Cultural sensitivity and Basic writing skills.

COURSE DESCRIPTION AND OBJECTIVES:

English Proficiency and Communication Skills seeks to develop the students' abilities in grammar, speaking, reading, writing and overall comprehension skills. The course will provide students an exposure on a wide range of language use in everyday situations. It will make the students to equip with functional English and make them use it confidently in their professional and social contexts. Finally, students will strengthen their reading, writing, listening and speaking skills in English

MODULE-1

0L+0T+16P=16 Hours

UNIT-1

MY LIFE AND HOME – MAKING CHOICES – HAVING FUN

Reading: Understanding main message, factual information global meaning, specific information and paraphrasing.
Writing: Developing hints based mail, Writing short messages/paragraphs.
Listening: Understanding short monologues or dialogues and choose the correct visual.
Speaking: Express simple opinions /cultural matters in a limited way.
Vocabulary: Discerning use of right word suiting the context, B1 Preliminary word list.
Grammar: Frequency Adverbs, State Verbs, AFV and Prepositions.

UNIT-2

ON HOLIDAY - DIFFERENT FEELINGS – THAT'S ENTERTAINMENT!

Reading: Longer text for detailed comprehension, gist and inference.
Writing: Developing notes and responding to penfriends or 'e-pals'.
Listening: Understand straightforward instructions or public announcements.
Speaking: Describing people, things and places in a photograph.
Vocabulary/Grammar: Comparatives and Superlatives, Gradable and non-gradable adjectives, Cloze tests.

PRACTICES:

- Developing hints based mail.
- Writing short message.
- Writing paragraphs.
- Expressing opinions and cultural matters.
- Understanding short monologues.
- Understanding straightforward instructions and public announcements.
- Describing people, things and places in a photograph.

MODULE-2

0L+0T+16P=16 Hours

UNIT-1

GETTING AROUND – INFLUENCES - STAY FIT AND HEALTHY

Reading: Reading for understanding coherence of the text and drawing inferences.
Writing: Reading an announcement from a magazine or website for preparing an article.
Listening: Discussion activities and listening to understand the gist of each short dialogue.
Speaking: Snap Talks, Make and respond to suggestions, discuss alternatives and negotiate agreement.
Vocabulary / Grammar: Punctuation, Prepositions, Phrasal Verbs, B1 Preliminary word list.

UNIT-2

LOOKS AMAZING! – THE NATURAL WORLD – EXPRESS YOURSELF!

Reading: Content, Communicative Achievement, Organisation and Language.
Writing: Developing a story with clear links to the given opening sentence.
Listening: An interview for a detailed understanding of meaning and to identify attitudes
and opinions.
Speaking: Discuss likes, dislikes, experiences, opinions, habits, etc.
Vocabulary / Grammar: Modals, Conditionals, Verb forms (Time and Tense).

PRACTICES:

- Listening to understand the gist of each short dialogue.
- Listening to an interview for a detailed understanding of meaning and to identify attitudes and opinions.
- Preparing an article.
- Discuss for alternatives and negotiate agreement.
- Discussion on likes, dislikes, experiences, opinions, habits, etc.

SKILLS:

- Use of appropriate grammar and vocabulary with syntactic patterns in short texts.
- Read and extract the main message, global meaning, specific information, detailed comprehension, understanding of attitude, opinion and writer purpose and inference.
- Listen to understand key information, specific information, gist and detailed meaning and to interpret meaning.
- Understand questions and make appropriate responses and talk freely on everyday topics.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply to read and grasp content on a range of topics/texts related to their everyday life like notifications, advertisements, travel brochures, news reports, articles.	Apply	1	7, 8, 9, 10, 12
2	Apply suitable strategies to achieve comprehension, like listening for main points and checking comprehension using contextual clues etc.	Apply	1	7, 8, 9, 10, 12
3	Demonstrate vocabulary beyond that of the familiar subjects.	Analyze	1, 2	7, 8, 9, 10, 12
4	Show sufficient control of English grammar and sentence variety to coherently organise information at sentence and discourse levels.	Evaluate	2	7, 8, 9, 10, 12
5	Use functional English to communicate and interact effectively in everyday situations.	Create	2	7, 8, 9, 10, 12

TEXT BOOKS:

1. Emma Heyderman and Peter May, "Complete Preliminary", Student's Book with Answers, 2nd edition, Cambridge University Press, 2019.

REFERENCE BOOKS:

1. Annette Capel and Rosemary Nixon, "Introduction to PET", Oxford University Press, 2009.
2. Adrian Doff and Craig Thaine, "Empower Pre intermediate", Cambridge University Press, 2015.
3. Louise Hashemi and Barbara Thomas, "Objective PET", Cambridge University Press, 2010.

24EN102 – TECHNICAL ENGLISH COMMUNICATION

Hours per week

L	T	P	C
2	0	2	3

PREREQUISITE KNOWLEDGE: Basic sentence formation, understanding contextual meanings, basic writing skills and moderate fluency in English.

COURSE DESCRIPTION AND OBJECTIVES:

In this course students will read, analyze, and interpret material from technical and general fields, and practice reading, writing, listening and speaking skills to gain exposure and functional English on a variety of contemporary topics. The overall course objective is to provide English for Specific Purposes(ESP) instruction to enhance students' reading, writing, listening and speaking skills through a practice in the language. It will aim to build students' confidence and motivation through exposure to academic skills like Note making/taking, Paraphrasing, Summarizing, Report Writing, Making Presentations etc., so as to generate interest in the language from an ESP perspective. Finally, students are expected through the course to gain key strategies and expression for communicating with professionals and non-specialists.

MODULE-1

16L+0T+16P=32 Hours

UNIT - 1

GENETICS

Reading: Reading for **Note Making** Sub skills: Reading for global understanding (skimming), specific information (scanning), understanding main ideas and supporting ideas, guessing contextual meanings from the text. -Vocabulary building: commonly used roots, prefixes, and suffixes.

Writing: Note making, organising main points and sub points, numbering and sequencing, suggesting titles, paraphrasing and summarising. **Functional grammar:** Common Errors in Articles and Prepositions (Handout).

Listening: Listening for **Note Taking**: top down and bottom up approach, listening for main ideas and supporting points.

Speaking: Presentation in teams - ideas on the topic summarised, making a PPT, effective introductions and conclusions, logical organisation of content, using appropriate structure and cohesive devices.

UNIT - 2

NEW-AGE ENTREPRENEURS

Reading: Reading: predicting, skimming, scanning, reading for inference, extrapolative reading **Vocabulary building:** Academic vocabulary from the text: synonyms, antonyms, Words often confused.

Writing: Paragraph writing; writing a topic sentence, supporting sentences, effective introductions and conclusions, use of cohesive devices. Types of Paragraphs: Descriptive, narrative, argumentative and expository. **Functional grammar**: Common Errors in Verb forms and Conditional sentences (Handout) Model verbs.

Listening: Listening for identifying parts from a description, listening to and sorting information, listening for specific information.

Speaking: Narrating/Retelling an incident, using suitable cohesive devices/discourse markers Speaking of past and present habits/ activities/events - Speaking of future plans.

PRACTICES:

- Note making.
- Summarizing.
- Paragraph Writing.
- Reading Comprehension
- Error Correction and Restructuring.
- Vocabulary building.
- Process Description.
- Tenses.

MODULE-2

16L+0T+16P=32 Hours

UNIT - 1

SOCIAL MEDIA

Reading: Reading for factual information researching for supporting evidence - skimming, scanning, **Vocabulary building:** One-word substitutes.

Writing: Letter Writing - E-mail writing – New age communication – Format, protocol, and style- WhatsApp, Facebook and Twitter **Functional grammar:** Common Errors in Sub-Verb Agreement and Modals.

Listening: Listening to a **Business Presentation**: Listening for deducing information, for abstract details and specific details, listening for taking a message.

Speaking: Making a presentation with a PPT on a topic assigned- organising the presentation using appropriate discourse markers - presenting a point of view - Extempore.

UNIT - 2

HEALTH AND NUTRITION

Reading: Reading for data interpretation and information transfer from graphical aids to text reports (pictograms. tables, graphs, pie charts, flow charts), deducing specific information and general information -**Vocabulary building:** business vocabulary, collocations**,** idioms and phrasal verbs.

Writing: Writing a **Report**: Drafting general and factual reports - **w**riting an overview - an effective introduction - organising information into paragraphs (Stages of writing: planning /organising /writing /editing /rewriting) - **Functional grammar:** transformations and miscellaneous common errors.

Listening: Listening to a Ted talk and sorting information – taking notes from a discussion.

Speaking: Group Discussion – prerequisites -generating content - initiating a discussion - expressing one's opinion ~ leading a discussion - agreeing/ disagreeing to someone's view - cutting into a speech - body language and voice modulation.

PRACTICES:

- E-mail writing.
- Letter writing.
- Report writing.
- Process Description
- Data Interpretation
- Messaging in Social media.
- Writing Reviews.
- Group Discussion

SKILLS:

- Apply different subskills like skimming, scanning, reading for information, reading for inference etc. to understand different kinds of text.
- Apply different sub skills like top down, bottom up approaches to listening.
- Use functional vocabulary relevant to engineering and technology to express ideas lucidly.
- Use appropriate sentence structure, cohesive devices to construct simple text in regular correspondence like e-mails and letters.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply a variety of strategies to interpret and comprehend spoken texts/ discourse using contextual clues.	Apply	1	6, 7, 8, 9, 10, 12
2	Apply appropriate reading strategies to interpret content / material related to engineering and technology domain.	Apply	1	6, 7, 8, 9, 10, 12
3	Participate in discussions and make short presentations on general and technical topics.	Analyze	1, 2	6, 7, 8, 9, 10, 12
4	Possess an ability to write clearly on topics related to technology and workplace communication.	Evaluate	2	6, 7, 8, 9, 10, 12
5	Choose functional language, grammar structures, cohesive devices and skills of organisation to express clearly in speaking.	Create	2	6, 7, 8, 9, 10, 12

TEXT BOOKS:

1. N P Sudharshana & C Savitha, "English for Technical Communication", Cambridge University Press, 2016.

REFERENCE BOOKS:

1. Balasubramanian T, "A Text book of Phonetics for Indian Students", Orient Longman, New Delhi, 1989.
2. Krishnaswamy, N and Sriraman, T, "Current English for Colleges", Trinity publications, 2016.
3. Mohan Krishna and Meera Banerjee, "Developing Communication Skills", Macmillan India Ltd. New Delhi, 1990.
4. Ashraf Rizvi M, "Effective Technical Communication", 2nd Edition, McGraw Hill Education, 2017.
5. Narayanaswamy V R, "Strengthen your Writing", Third Edition Orient Black Swan, New Delhi, 2005.
6. Naterop, Jean, B. and Rod Revell, "Telephoning in English", 3rd Edition Cambridge University Press, Cambridge, 2004.

24MS101 MANAGEMENT SCIENCE

Hours per week:

L	T	P	C
2	2	0	3

PREREQUISITE KNOWLEDGE: Basic knowledge on the concepts of Management.

COURSE DESCRIPTION & OBJECTIVES: The objective of this course is to examine the ramifications of managerial practices within the field of engineering and Students will understand the significance of operation management and develop the ability to analyse the markets, customers, competitors, and accordingly plan HR function effectively.

MODULE- 1

16L+16T+0P=32 Hours

UNIT-1

INTRODUCTION TO MANAGEMENT

Concepts of Management and organization - nature, importance and Functions of Management, Evolution of Management Thought - Taylor's Scientific Management Theory, Fayol's Principles of Management, Administrative Management Theory, Mayo's Hawthorne Experiments, Maslow's Theory of Human Needs, Herzberg's Theory, Leadership Styles, Corporate Social Responsibility in Indian perspectives.

UNIT-2

OPERATIONS MANAGEMENT

Principles of plant location, Principles and types of plant layout, Operations and productivity, Project Management - Project Planning, Project Scheduling and Project Controlling, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure and Stores Management. Statistical process Control: Control Charts for variables – Setting Mean Charts Limits (X Charts) and Setting Range Chart Limits (R Charts). Control Charts for attributes- P-charts and C-charts.

PRACTICES:

- Design a comprehensive management strategy for a startup company, incorporating elements of planning, organizing, leading, and controlling.
- Develop a quality management plan for a software development project, outlining procedures for testing and validation with a view of project management procedure.
- Critically evaluate the effectiveness of different styles of leadership in crisis situations versus during times of stability with suitable examples from different organisations.
- Determining the various statistical controlling methods such as, X and R Charts for a specific company with the data.

MODULE- 2

16L+16T+0P=32 Hours

UNIT- 1

HUMAN RESOURCES MANAGEMENT

Concepts of Human Resource Management, Basic functions of HR Manager - Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary

Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

UNIT- 2

MARKETING MANAGEMENT

Evolution of Marketing, Functions of Marketing Selling Vs Marketing, 4 P's of Marketing – Product Mix - Product Life Cycle, Place Mix – Channels of Distribution, Price Mix – Pricing Methods, Promotion Mix – Tools of Promotions. 7p's of marketing - Product, Price, Promotion, Place, People, Packaging, and Process.

PRACTICES:

- Select any Designation in an organization and describe its job description and job specifications.
- Develop a procedure on how to deal with grievances at your work with suitable example.
- Analyze marketing mix competencies for product as well as services.
- Analyze the Product Mix strategies of a select company with appropriate examples.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to

Co No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Analyze the nature and consequence of management.	Analyze	1	1,2,4,6,8,9,11,12
2	Explore significance of operations management.	Analyze	1	1, 2, 3, 4,5,7,10
3	Plan and control the HR function effectively.	Apply	2	1,2,3,4,5,6,8,11,12
4	Evaluate the markets, customers, and competition.	Evaluate	2	1,2,4,5,6,7,9,10

TEXT BOOKS:

1. Stoner, Freeman, Gilbert, "Management", Pearson, 6th edition, 2018.
2. Aryasri, "Management Science", McGraw Hill, 4th edition, 2014.

REFERENCE BOOKS:

1. Kotler Philip & Keller Kevin Lane, "Marketing Management", Pearson, 15th Edition,2020.
2. Koontz & Weihrich, "Essentials of Management", Mc Graw Hill,11th Edition, 2020.
3. PC Tripathi, PN Reddy & Ashish Bajpai "Principles of Management", Mc Graw Hill, 7th Edition, 2021.

24SA101 - ORIENTATION SESSION

Hours per week:

L	T	P	C
0	2	0	1

PREREQUISITE KNOWLEDGE: Nil

COURSE DESCRIPTION AND OBJECTIVES:

This course is intended to help the students in getting adjusted with the new environment, to develop bondage with other students and faculty along with learning the institutional policies. The purpose of the orientation course is to create awareness on various issues that are essential for any individual.

It engages with the new students as soon as they come into the institution, before regular classes start. At the start, the incumbents learn about the institutional policies, processes, practices, culture and values, and their mentor groups are formed under SAGE (Socializing, Associating, Governing,Experiencing)

OBJECTIVES:

- To familiarize the fresh entrants with the new environment and system in engineering education.
- To make the students a responsible citizens.
- To promote smooth transition from +2 level education to graduate program among students.

MODULE-1

0L+16T+0P=16Hours

UNIT-1

Socializing: Interaction with faculty members, Deans, peers, student bodies and alumni.

UNIT-2

Associating: Eco-friendly practice and sustainable living, teaching sessions to school children of adopted villages, Interaction with farmers and identifying the problems, Field Visits

PRACTICES

- Stress assessment and management
- Sustainable living
- Iconic visit

MODULE-2

0L+16T+0P=16Hours

UNIT-1

Governing: Brief about regulations and assessment pattern, Interaction with the functionaries i.e. Chancellor, Vice Chancellor and Registrar

UNIT-2

Experiencing: Physical activity, Creative arts, Literary activities, Customizing Daily routines and Habits, Practicing Meditation.

PRACTICES

- Yoga and meditation
- Sports and Games
- Any of the one creative art

COURSE OUTCOMES:

Upon successful completion of the course, students will have the ability to:-

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Become familiar with the institute ethics and culture	Apply	1	7,8,9,10,12
2	Cope up with stress management through meditation	Analyze	1	7,8,9,10,12
3	Socially conscious towards the society and environment	Apply	2	7,8,9,10,12
4	Build bonds with peers and faculty members	Apply	2	7,8,9,10,12

24SA103 - PHYSICAL FITNESS, SPORTS AND GAMES

Hours per week:

L	T	P	C
0	0	2	1

PREREQUISITE KNOWLEDGE: Nil

COURSE DESCRIPTION AND OBJECTIVES:

Physical fitness is a state of health and well-being and, more specifically, the ability to perform aspects of sports, occupations, and daily activities. Being physically active can improve brain health, help manage weight, reduce the risk of disease, strengthen bones and muscles, and improve ability to do everyday activities.

~~**OBJECTIVES**:~~

- ~~To make an individual physically fit, mentally alert, emotionally balanced, socially well adjusted, morally true and spiritually uplifted.~~
- ~~To make them agile and efficient for hard work and effective instruments for the achievement of their life's objectives.~~

MODULE – 1 & 2

The activities proposed under physical fitness are -

- Yoga and meditation
- 100 m
- 400 m
- Push Ups
- Individual game warm up
- Volleyball, Basketball, Kabaddi, Kho Kho, Badminton and Football- Basic skills of the game will be taught on rotation basis each week

PRACTICES

- Yoga and meditation
- 100 m
- 400 m
- Push Ups

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Understand the knowledge about the practice of Yoga and its nature.	Analyze	1,2	1,2,6,9
2	Make familiar with the different system of the body.	Apply	1,2	1,2,9,12
3	Skills in explanation and demonstration of meditation.	Apply	2	1,2,3,9,12
4	Understood the information about the importance of diet and nutrition.	Evaluate	2	1,2,9,12
5	Ability to set up Yoga therapy center and skill to maintain case studies.	Create	1	1,2,3,9,12

TEXT BOOKS:

1. Sachitra Yoga pradipika: B. K. S. Ayyanger, ISBN 9788125016779
2. Yoga Chaitanya Pradipika: Yogacharya Dr. Raparthi Ramarao, Telugu, Year Published: 2003

REFERENCE BOOKS:

1. Asana pranayama Mudras Bandhas: Swami Satyananda Saraswati, Saraswati, Swami Satyananda, and Janez Kristijan Hiti. Asana pranayama mudra bandha. Bihar, India: Yoga Publications Trust, 1996.

24SA102 - SELF EMPOWERMENT & GENDER SENSITIZATION

Hours per week:

L	T	P	C
0	0	2	1

PREREQUISITE KNOWLEDGE: Gender Sensitisation and Personality Development

COURSE DESCRIPTION AND OBJECTIVES: To comprehend the dynamics of gender roles and relations within social and cultural contexts, and to evaluate legal and behavioral frameworks that promote gender equality and personal growth.

MODULE-I

0L+0T+16P=16Hours

UNIT-1

UNDERSTANDING GENDER:
Understanding of Gender, Gender Roles & relations, gender & culture, gender based violence,

UNIT-2

GENDER LAWS:

Gender & labour, Gender constitutional & Legal Perspectives.

PRACTICES:

- Conduct a survey on gender roles and relations in the banking and IT sectors to assess employee attitudes and resistance to policy changes.
- Undertake a study to identify the impact of cultural perceptions on gender-based violence and its effects on workplace productivity.
- Analyze the characteristics and components of gender laws to evaluate their effectiveness in promoting labor rights and reducing gender discrimination.
- Perform a study on the determinants of gender roles and culture by reviewing media content and social norms to understand their influence on attitudes.
- Conduct a comparative analysis of constitutional and legal perspectives on gender equality to assess their impact on labor practices and gender sensitivity in various industries.

MODULE-2

0L+0T+16P=16Hours

UNIT-1
SELF EMPOWERMENT:
Types of personality, Good Manners & Etiquettes, Ways to develop positive attitude

UNIT-2

PERSONALITY DEVELOPMENT: Decision Making Skills, Interpersonal Skills, Time Management, Stress Management, Conflict Management, Leadership Skills.

PRACTICES:

- Survey on different personality types and their impact on workplace performance and team dynamics.
- Undertake a study on the effectiveness of etiquette training programs in improving professional interactions and workplace relationships.
- Analyze strategies for developing a positive attitude and their impact on employee engagement and job satisfaction.
- Conduct a study on time management practices and their influence on productivity and work-life balance.
- Perform a study on conflict management techniques and their effectiveness in resolving workplace disputes and improving team cohesion.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Analyze the influence of gender roles and cultural norms on individual behavior and social structures.	Analyze	1	3
2	Apply legal perspectives and gender laws to assess their impact on gender equality and labor rights.	Apply	1	2
3	Analyze various personality types and develop strategies to apply good manners and etiquette in diverse settings.	Analyze	2	4
4	Apply decision-making and time management skills to enhance personal and professional effectiveness.	Apply	2	6
5	Analyze conflict management and leadership skills to effectively handle interpersonal and organizational challenges.	Analyze	2	1

REFERENCES:

1. A World of Equals: A Textbook on Gender, Susie Tharu, Uma Maheswari Bhrugubanda (2022), Orient Blackswan Pvt Limited
2. Chitra Chellam (2022), Personality Development, Sara Book Publication.

24SS101-CONSTITUTION OF INDIA

Hours per week:

L	T	P	C
0	2	0	1

PREREQUISITE KNOWLEDGE: High School-level Civics and Social Studies.

COURSE DESCRIPTION AND OBJECTIVES:

To provide students with a basic understanding of Indian Polity and Constitution and make students understand the functioning of government at the center and state level besides local self-government. This course also equips students with knowledge pertaining to fundamental rights and fundamental duties of a citizen in a democracy such as India.

MODULE-1

0L+16T+0P=16 Hours

UNIT-1

HISTORICAL BACKGROUND TO THE INDIAN CONSTITUTION

Meaning of the constitution law and constitutionalism; Historical perspective of the Constitution of India; Salient features and characteristics of the Constitution of India.

UNIT-2

FUNDAMENTAL RIGHTS, DUTIES, DIRECTIVE PRINCIPLES, AND AMENDMENT

Scheme of the fundamental rights - scheme of the Fundamental Right to Equality Article 14, scheme of the Fundamental Right to certain Freedom under Article 19, scope of the Right to Life and Personal Liberty under Article 21; Scheme of the Fundamental Duties and its legal status; Directive Principles of State Policy – its importance and implementation; Amendment of the Constitution - Powers and Procedure.

PRACTICES:

- Enactment of Constituent Assembly debates to further understand the rationale for the provisions of the constitution.
- Fundamental Rights in our popular culture - discussion in the movie Jai Bhim.
- Understanding the application of DPSPs in the law making procedure of the country
- Critically evaluating the challenges in the amendment of the constitution- reference to supreme court judgments.

MODULE-2

0L+16T+0P=16 Hours

UNIT-1

STRUCTURE AND FORM OF GOVERNMENT

Federal structure and distribution of legislative and financial powers between the Union and the States; Parliamentary Form of Government in India – The constitution powers and status

of the President of India; Emergency Provisions-National Emergency, President Rule, Financial Emergency.

UNIT-2

LOCAL SELF GOVERNMENT

Local Self Government – Constitutional Scheme in India – 73rd and 74th Amendments (PRIs)

PRACTICES:

- Debate on the challenges to federalism in India.
- Critical presentation on the functioning of local self-government- references to the principle of decentralization
- Analyzing the implementation of reservation for women/marginalized communities in the local body elections.
- The financial challenges in the functioning of local self-governments- references to the devolution of the funds by the Finance commission of India (Article-280)

SKILLS:

- Understanding the basics of the Indian constitution.
- Know the fundamental rights, fundamental duties, and Directive Principles of State Policy.
- Fair knowledge about the functioning of various institutions in a democracy.

COURSE OUTCOMES:

Upon successful completion of the course, students will have the ability to:

CO No.	CO's	Blooms Level	Module No.	Mapping with PO's
1	Analyze major articles and provisions of the Indian constitution.	Analyze	1	6,8,9,10,12
2	Appreciation for the constitution and safeguarding individual rights.	Apply	1	6,8,9,10,12
3	Evaluating functions of various organs of the State in a democracy.	Evaluate	2	6,8,9,10,12
4	Evaluating distribution of powers at the various levels of the Government	Evaluate	2	6,8,9,10,12

TEXTBOOKS:

1. PM Bhakshi, "Constitution of India", Universal Law Publishing, 15th edition, 2018.
2. DD Basu "Introduction to Constitution of India", LexisNexis Publishing, 23rd edition, 2018.

REFERENCE BOOKS:

1. B. R. Ambedkar, "The Constitution of India" Educreation Publishing, India, 2020.
2. Subhash Kashyap, "Our Constitution", National Book Trust, India, 2nd edition, 2011.
3. Arun K. Thiruvengadam, "The Constitution of India: A Contextual Analysis", Hart Publishing India, 2017.

24SS102 - INDIAN KNOWLEDGE SYSTEMS

Hours per week:

L	T	P	C
0	2	0	1

PREREQUISITE KNOWLEDGE: High School – level knowledge on Indian history and society.

COURSE DESCRIPTION AND OBJECTIVES:

The course introduces students to India's rich and diverse knowledge traditions and heritage. The profound insights, timeless wisdom, and diverse perspectives, originating from the ancient past have played a major role in shaping the country's cultural identity. The richness of India's intellectual heritage is vindicated by the existence of innumerable texts and thinkers in the country. By exploring India's knowledge traditions, the course aims to help students learn how the country's culture developed across the ages and to enable them look beyond conventional methods in finding solutions to scientific and technological issues.

MODULE-1

0L+16T+0P=16 Hours

UNIT-1

Overview of Indian Knowledge Systems (IKS)

Definition, Scope, and Significance of Indian Knowledge Systems; Various fields of study in IKS; Texts and sources of information for IKS; Vedic, Buddhist, Jain and other philosophies

UNIT-2

Ancient Contributions to Indian Knowledge Systems (IKS)

Contribution of ancient centers of learning; Contribution of prominent ancient philosophers

PRACTICES:

- Collecting information on Indian Knowledge Systems mentioned in the daily newspapers that report on unearthing new archeological discoveries, technologies, artforms, etc.
- Engaging in practical application of traditional indigenous techniques such as Yoga, Meditation, body art, martial arts viz. Karra saamu, etc.
- Group presentations on various indigenous sites of significance
- Poster display of profiles of prominent ancient philosophers

MODULE-2

UNIT-1 **0L+16T+0P=16 Hours**

Discipline-Specific Indian Knowledge Systems

Role of IKS within the discipline; Identifying and defining key concepts of IKS within the discipline; Demonstration of IKS via real-life examples (of technology, machinery, practices, artforms, architecture, etc.)

UNIT-2

IKS in the Modern World

Relevance of IKS in Contemporary Society; Challenges and Opportunities in Preserving and Utilizing IKS; Contributions of IKS to Global Knowledge Systems; Future Directions: Integrating IKS with Modern Science and Technology

PRACTICES:

- Exploring native technology, strategies, and methodologies specific to the discipline.
- Documenting various indigenous knowledge traditions.
- Using internet to gain awareness on various indigenous intellectual properties that are at risk of international appropriation.
- Group discussion on challenges to IKS from within the discipline

SKILLS:

- Analyzing and evaluating IKS practices in the context of modern challenges.
- Inculcates problem-solving skills by applying IKS principles to address contemporary issues.
- Sharpens research skills by gathering and analyzing information related to IKS.
- Inspires to work with others in preserving and promoting IKS.
- Motivates to learn and practice traditional skills like weaving, pottery, herbal medicine, etc.

COURSE OUTCOMES:

Upon successful completion of the course, students will have the ability to:

CO No.	CO's	Blooms Level	Module No.	Mapping with PO's
1	To understand the history, ancient knowledge and cultural practices of the people of India and apply its relevance to contemporary world	Apply	1, 2	6, 9, 10, 12
2	To analyze various case-studies from ancient India in the fields of science, technology, psychology, and society	Analyze	1, 2	6, 9, 10, 12
3	To analyze global implications of protecting indigenous knowledge systems	Analyze	1, 2	6, 9, 10, 12
4	To revive and revitalize ancient knowledge and evaluate the applicability of the concepts to contemporary scientific/technical methods, individual well-being and society at large	Evaluate	1, 2	6, 9, 10, 12

TEXTBOOKS:

1. B. Mahadevan, Vinayak Rajat Bhat, Nagendra Pavana R. N., "Introduction to Indian Knowledge System: Concepts and Applications", PHI Learning Private Limited, Delhi, 2023.
2. Mukul Chandra Bora, "Foundations of Bharatiya Knowledge System", Khanna Book Publishing, 2023.

REFERENCE BOOKS:

1. Dhirendranath Banerjee and Sanjit Kumar Sadhukan (ed.), "Ancient Indian Scientific Thought and Modern Theories: An Overview", National Mission for Manuscripts and D. K. Printworld, 2019.
2. Shaik Taufiq Khalil, "Indian Knowledge System: Arthshastra by Kautilya", Notion Press, 2023.
3. Chauhan Bhag Chand, "IKS: The Knowledge System of Bharata", Garuda Prakashan, 2023.