First Year (FY B. Tech.) Electronics and Telecommunication Engineering
w.e.f. AY:2025- 2026 (2025 Pattern)

SEMESTER-I

Course Code	Courses Name	Teaching Scheme			Examination Scheme and Marks							Credits			
		TH	PR	TUT	CAA	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
BS25101	Engineering Mathematics - I	3	-	1	10	30	60	30	-	-	130	3	-	1	4
BS25104	Engineering Chemistry	2	2	-	10	-	60	30	-	-	100	2	1	-	3
ET25101	Basic Electronics Engineering	2	2	-	10	-	60	30	-	-	100	2	1	-	3
ME25101	Engineering Graphics	2	2	-	10	-	60	30	-	-	100	2	1	-	3
CO25101	Fundamentals of Programming Languages	2	2	-	10	-	60	30	-	-	100	2	1	-	3
CO25102	Software lab	1	2	-	10	-	-	50	-	-	60	1	1	-	2
HS25102	Indian Knowledge System	2	-	-	-	-	-	30	-	30	60	2	-	-	2
HS25104	Physical Education - Exercise and Field Activities	-	4	-	-	-	-	50	-	-	50	-	2	-	2
	Total	14	14	1	60	30	300	280	-	30	700	14	07	01	22

SEMESTER-II

Course Code	Courses Name	Teaching Scheme			Examination Scheme and Marks							Credits			
		TH	PR	TUT	CAA	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
BS25102	Engineering Mathematics - II	3	-	1	10	30	60	30	-	-	130	3	-	1	4
BS25103	Engineering Physics	2	2	-	10	-	60	30	-	-	100	2	1	-	3
EL25101	Basic Electrical Engineering	2	2	-	10	-	60	30	-	-	130	2	1	-	3
CE25101	Applied Mechanics	2	2	-	10	-	60	30	-	-	100	2	1	-	3
ET25102	Electronics Measuring Instruments & Tools	3	-	-	10	30	60	-	-	-	100	3	-	-	3
ET25103	Workshop	1	2	-	10	-	-	50	-	-	60	1	1	-	2
HS25102	Communication and Professional Skills	2	-	-	-	-	-	30	-	30	60	2	-	-	2
HS25103	Art and Culture	-	4	-	-	-	-	50	-	-	50	-	2	-	2
	Total	15	12	1	60	60	300	250	00	30	700	15	06	01	22

Dean Academic

Dean Autonomy

HOD

Principal

Vidya Prabhithan's

BS25101-Engineering Mathematics-I (Linear Algebra and Calculus)		
Teaching Scheme **Theory: 3 Hours/Week** **Tutorial: 1 Hour/Week**	**Credits** **03+01=04**	**Examination Scheme** **Course Activity: 10 Marks** **In-Semester: 30 Marks** **End-Semester: 60 Marks** **Term Work: 30 Marks**

Prerequisites:
Differentiation, Integration, Basics of Matrices and Determinants.

Course Objectives:
To make the students familiar with the concepts and techniques of calculus and matrices. The aim is to equip them with the methods to understand advanced-level mathematics and its applications to enhance analytical thinking power, useful in their disciplines.

Course Outcomes (COs): The students will be able to
CO1: Expand function in power series using Taylor's and Maclaurin's series and evaluate indeterminate form using L' Hospital Rule.
CO2: Understand basic concepts of periodic functions, Fourier series, and harmonic analysis.
CO3: Develop basic concepts of partial derivatives and apply to solve various problems on partial derivatives.
CO4: Apply partial differentiation to evaluate Jacobian, extreme values of the functions and estimate Error & Approximation.
CO5: Apply the concept of rank to solve systems of linear equations, examine linear dependent and independent vectors, and analyze systems of linear equations and transformation.
CO6: Understand the concept of Eigenvalues and eigenvectors and apply it to solving Engineering problems.

Course Contents

Unit 1: Differential Calculus **[07 Hours]**
Expansion of Functions: Taylor's series, Maclaurin's series, Indeterminate Forms, L' Hospital rule, Evaluation of limits.

Unit 2: Fourier Series **[07 Hours]**

Definition, Dirichlet's conditions, Full Range Fourier Series, Half Range Fourier Series, Harmonic Analysis and Applications to Problems in Engineering.

Unit 3: Partial Differentiation [07 Hours]

Introduction to functions of several variables, Partial Derivatives, Euler's Theorem on Homogeneous functions, Partial derivative of Composite Function, Total Derivative.

Unit 4: Applications of Partial Differentiation [07 Hours]

Jacobian and its applications, Errors and Approximations, Maxima and Minima of functions of two variables, Lagrange's method of undetermined multipliers.

Unit 5: Linear Algebra-Matrices, System of Linear Equations [07 Hours]

Rank of a Matrix, Echelon form and Normal form, System of Linear Equations, Linear Dependence and Independence, Linear and Orthogonal Transformations, Application to Problems in Engineering.

Unit 6: Linear Algebra-EigenValues and EigenVectors, Diagonalization [07 Hours]

Eigenvalues and Eigenvectors, Cayley Hamilton theorem, Diagonalization of a matrix and Applications.

Textbooks:

1. Higher Engineering Mathematics by B. V. Ramana 1st ed (Tata Mcgraw Hill, 2011)
2. Applied Mathematics (Vol. I & Vol. II) by P.N.Wartikar and J.N.Wartikar (Pune Vidyarthi Griha Prakashan, 2009.)

Reference Books:

1. Engineering Mathematics: A tutorial approach by Ravish R Singh and Mukul Bhatt (1st ed, McGraw Hill Education India Pvt Ltd, 2013)
2. Higher Engineering Mathematics by B. S. Grewal (44th ed: Khanna Publication, 2019).
3. Advanced Engineering Mathematics by Erwin Kreyszig (10th ed: Wiley India, 2023).
4. Advanced Engineering Mathematics by Peter O'Neil (8th ed: Cengage Learning, 2024)

Guidelines for Tutorial and Term Work:

1. Tutorial for the subject shall be engaged in a minimum of three batches per division (Batch size of 23 students maximum)
2. Term work shall consist of six assignments on each Unit-1 to Unit-6 and is based on Performance and continuous internal assessment.

BS25104: Engineering Chemistry		
Teaching Scheme:	**Credits:03**	**Examination Scheme:**
TH: 02 Hrs/Week		**Course Activity: 10 Marks**
		End-Semester Exam: 60 Marks
PR: 02 Hrs/Week		**Term-Work: 30 Marks**

Prerequisite Courses:

Knowledge of water and pollution, periodic table, Titrations- volumetric analysis, structure property relationship, types of crystals, classification and properties of polymers, knowledge of fuels, electromagnetic radiations, electrochemical series and corrosion

Companion Course, if any: Laboratory Practical

Course Objectives:

1. To understand technology involved in the analysis of water for improving its quality as a commodity by purification.
2. To understand the fundamentals of corrosion with its mechanisms and study preventive methods for corrosion control.
3. To understand chemistry of engineering materials and learn the importance of speciality polymers and nanomaterial.
4. To study conventional and green fuels with respect to their composition, properties and applications and to explore energy storage technologies in batteries.

Course Outcomes

On completion of the course, learner will be able to

CO-1: Apply their knowledge to real-world water quality challenges and treatment solutions.

CO-2: Explain causes of corrosion and methods used for minimizing corrosion along with finishing of metals with technological importance.

CO-3: Illustrate the knowledge of advanced engineering materials for various engineering applications on the basis of structure and properties.

CO-4: Assess fuels and evaluate the potential of different energy sources for future applications along with energy storage.

Course Contents

Unit I: Water Treatment **(7 Hrs)**

Impurities in water (Suspended, Biological & Dissolved chemicals), Hardness of water- Types, Units (no conversions) & Numericals. Analysis of water: alkalinity, hardness (EDTA method)- Numericals. Water Softening methods: Demineralization, Electrodialysis and Reverse Osmosis method.

Unit II: Corrosion and Corrosion Control **(7 Hrs)**

Introduction, Types of corrosion – Dry and Wet corrosion. Nature of oxide films and Pilling-Bedworth's rule. Mechanism of Dry and wet corrosion, Electrochemical theory of wet corrosion – galvanic cell corrosion, differential aeration corrosion. Factors influencing rate of corrosion: nature of metal, nature of environment. **Methods of corrosion control and prevention:** Metallic coatings and its types, surface preparation, methods to apply metallic coatings - hot dipping (galvanizing & tinning), metal cladding and electroplating.

Unit III: Engineering Materials: **(7 Hrs)**

Polymers: Introduction, Classification of polymers, Thermoplastics and Thermosets, Polymer terminologies, properties of polymers- Crystallinity and Glass transition temperature. Speciality Polymers: Introduction, Structure, properties and applications of the following polymers- **Biodegradable Polymers:** Poly lactic acid (PLA) and Polyhydroxy Butyrate Valerate, PHBV **Polymer composites:** Fiber reinforced plastic (FRP)- Carbon reinforced polymer composite. **(Introductory part of Polymer must be given for self-preparation)**

Nanomaterials: Definition, Importance of nanomaterials Classification with examples. **Quantum dots**: Definition, difference between Nanomaterials and quantum dots, Synthesis of Metal, Metal oxide and Metal Sulphide nanomaterials by Co-Precipitation method.

Unit IV: Renewable Energy Sources **(7 Hrs)**

Introduction (definition, classification of fuels and characteristics of an ideal fuel), Calorific value (CV): Higher calorific value (HCV) and Lower calorific value (LCV), **Green Fuels:** Introduction to Power alcohol and Biodiesel. Preparation reactions, properties, advantages and disadvantages of Power alcohol and Biodiesel. Hydrogen gas as a future fuel: synthesis by Steam reforming method, difficulties in the storage of hydrogen (gas-Liquid and Physical forms). **Batteries:** H_2-O_2 Fuel Cell, Solar cell and Li-ion Battery- Principal, Construction and Working with applications.

Books & Other Resources:

Text Books:

1. Engineering Chemistry, Wiley India Pvt. Ltd.
2. Engineering Chemistry by O. G. Palanna, Tata McGraw Hill Education Pvt. Ltd.
3. Textbook of Engineering Chemistry by Dr. S. S. Dara, Dr. S. S. Umare, S. Chand & Company Ltd.

Reference Books:

1. Basic Concept of Analytical Chemistry, 2ed, S. M. Khopkar, New Age-International Publisher.
2. Recent trends in Fuel Cell Science and Technology- Suddhasatwa Basu, Anamaya Publishers, New Delhi.
3. Polymer Science, V. R. Gowarikar, N. V. Viswanathan, Jayadev Sreedhar, Wiley Eastern Ltd.
4. F.W. Billmeyer, Text Book of Polymer Science, John Wiley & Sons, 4th Edition, 1999.
5. Principles of Physical Chemistry, B.R. Puri, L.R. Sharma & M.S. Pathania, S. Nagin Chand & Co., 41st Edition, 2004.
6. Instrumental Methods of Chemical analysis, V. K. Ahluwalia, Springer Nature publisher. (ebook)

Guidelines for Laboratory - Term work Assessment:

1. The distribution of weightage of term work marks should be informed to students before start of the semester.
2. Term work assessment should be on continuous basis. At frequent intervals students are expected to inform about their progress/lagging.

Guidelines for Laboratory Conduction:

1. DO's and DONT'S, along with precautions, are need to be displayed at prominent location in the laboratory.
2. Students should be informed about DO'S and DON'T and precautions before performing.

LIST OF PRACTICALS [Any 10 (9+1) to be performed by the student]

1. To determine hardness of water by EDTA method.
2. To determine alkalinity of water.
3. To determine strength of strong acid using pH meter.
4. Titration of a strong acid with strong base using conductivity meter.
5. To determine molecular weight/radius of macromolecule polystyrene/ polyvinyl alcohol by viscosity measurement.
6. Determination of fixed carbon content of coal by proximate analysis.
7. Study of corrosion of metals in a medium of different pH.
8. Estimation of percentage of iron in the given rust solution using standard Potassium Dichromate solution (External indicator method).
9. Electroplating of copper on zinc/iron plate.
10. Saponification/acid value of oil.
11. To Determine Chloride content of water by Mohr's method.
12. To determine maximum wavelength of absorption of $CuSO_4$/$FeSO_4$/ $KMnO_4$, verify Beer's law and find unknown concentration of given sample.

Demonstration Experiments:

13. Synthesis of Conducting Polyaniline from Aniline by Chemical Oxidative Polymerization and Conductivity measurements.
14. Study of pH sensitive Keto-enol tautomerism in curcumin (Turmeric).

Subject: Basic Electronics Engineering (ET25101)		
Teaching Scheme: **TH: 02 Hrs./week** **PR: 02 Hrs./week**	**Credits: 03**	**Examination Scheme** **Course Activity: 10 Marks** **End - Semester: 60 Marks** **Term work: 30 Marks**

Course Objectives:

- The principle of electronics and working principle of PN junction diode and special purpose diodes.
- The functioning of transistors like BJT, MOSFETs and OPAMP.
- Basics of various logic gates, digital circuits and their applications.
- Working and functions of various electronic instruments.
- The operating principles and applications of various active and passive sensors.
- Basic principles of communication systems.

Course Outcomes: On completion of the course, the learner will be able to–

CO1: Know the working of the P-N junction diode and its circuits.

CO2: Understand the working of BJT & MOSFET, their characteristics & compare.

CO3: Build and test digital circuits using universal/basic gates and flip-flops.

CO4: Select sensors for specific applications. Describe the basic principles of communication systems.

Course Contents

Unit I: Introduction to Electronics and Diode Circuits (06 Hrs.)

Evolution of Electronics, Impact of Electronics in industry and society. Introduction to active and passive components.

P-N Junction Diode and applications: P-N Junction diode: construction and its working in forward and reverse bias condition, V-I characteristics of P-N junction Diode. Diode Applications: Diode as a switch, Half Wave Rectifier, Full wave center taps and Bridge Rectifier,

Special purpose diodes: Zener diode, Light Emitting Diode (LED) and photo diode along with V-I characteristics and their applications.

Unit II: Transistor and Op-amp (06 Hrs.)

Bipolar Junction Transistor: Construction, type, Operation, Different configurations of BJT, operating regions of BJT, input and output characteristics in CE configurations, DC load line and operating point, Applications of BJT: BJT as switch, Common Emitter Amplifier.

Metal Oxide Semiconductor Field Effect Transistors (MOSFET): Construction, Types, Operation, V-I characteristics, Regions of operation, MOSFET as switch & amplifier.

Operational amplifier

Functional block diagram of operational amplifier,

Ideal & practical values of performance parameters, Op-amp applications: Inverting, Non-inverting amplifier.

Unit III Number System and Logic Gates (06 Hrs.)

Number System: Binary, BCD, Octal, Decimal, Hexadecimal and their conversions, Signed and unsigned numbers, Binary arithmetic, Binary subtraction using 2's complement Boolean Algebra, De-Morgan's theorem.

Basic Gates: AND, OR, NOT, Universal Gate: NAND, NOR, XOR, XNOR.

Logic Circuits: Half adder, Full adder, Flip Flop's - SR, JK, T and D.

Introduction to Microprocessor and Microcontroller (Only block diagram and explanation).

Unit IV Sensors and Communication Systems (06 Hrs.)

Active /Passive Sensors, Selection Criteria/Characteristics of sensor, Motion Sensors (LVDT, Accelerometer), Temperature Sensors (Thermocouple, Thermistor, RTD), Optical Sensors (LDR),

Mechanical Sensors (Strain Gauge, Load Cell, Pressure sensors).
Block diagram of IoT-based Data Acquisition system.

Communication Systems

Block Diagram, Communication Media: Wired and Wireless, Electromagnetic Spectrum, Cellular concept, Block diagram of GSM system.

Books and Other Resources:

Text Books:

1. Thomas. L. Floyd "Electronics Devices", 9th Edition, Pearson (Unit I, II)
2. R.P. Jain, "Modern Digital Electronics", 4th Edition, Tata McGraw Hill (Unit III)
3. H.S. Kalsi, "Electronic Instrumentation", 3rd Edition, Tata McGraw Hill (Unit IV)
4. D. Patrnabis, "Sensors and Transducers", 2nd Edition, PHI (Unit V)
5. by Kennedy and Davis "Electronic Communication Systems", 4th Edition, Tata McGraw Hill (Unit VI)
6. M. Schwartz, "Mobile Wireless Communication", Cambridge University Press (Unit VI)

Reference Books:

1. Thomas. L. Floyd, "Digital Fundamentals", 11th Edition, Pearson
2. J. Schiller, "Mobile Communication", 2nd Edition, Pearson
3. S. Soloman, "Sensors Handbook", 2nd Edition.

List of Laboratory Experiments/Assignments

1.	**Electronic Components:** Study of Active and Passive components.
2.	**Measurements using various measuring equipment:** a) Set up CRO and function generator for measurement of voltage, frequency b) Measure voltage, current and resistance using a digital multimeter.
3.	**Diode Characteristics** a)V-I characteristics of PN Junction diode
4.	**Rectifier circuits:** Implement half-wave, full-wave and bridge rectifier using diodes
5.	**Frequency response of BJT :** To plot the frequency response of the BJT amplifier. **(Simulation)**
6.	**Test and verify the truth tables of:** a) Basic and Universal Gates **(Study the data sheet of respective ICs)** b) Half and Full Adder
7.	**Case Study any one of the electronic appliances (Microwave oven, AC, TV, Mobile, Washing Machine) with block diagram, specification etc.**
8.	Study of transducers/sensor (Any3)

HOD E&TC
Dr BH Patil

Dean Autonomy
Dr CB Nayak

Dean Academics
Dr SM Bhosle

Principal
Dr SB Lande

FYB. Tech (Sem-I and Sem-II)

ME25101- Engineering Graphics (2025 pattern)

Teaching Scheme:	**Credit**	**Examination Scheme:**
TH : 02 Hr/Week	**03 (TH: 02, PR:01)**	**CAA: 10 Marks**
PR : 02 Hr/Week		**End Sem: 60 Marks**
		TW: 30 Marks

Engineering Graphics is a fundamental subject in engineering that involves creating and interpreting graphical representations of objects, designs, and systems. It serves as a communication tool among engineers, designers, and other stakeholders in the engineering field. It is considered as a language of an engineer.

Prerequisite: Basic trigonometry and knowledge of basic drawing instruments

Course Objectives:

1. To communicate design concepts effectively through graphical representation.
2. To Gain knowledge of conic sections, their significance in engineering applications, and methods of constructing conic shapes.
3. To acquire knowledge of development of lateral surfaces for optimizing material usage.
4. To develop visualization skills through orthographic and isometric projections.
5. To make use of Computer Aided Design (CAD) software for developing technical drawings.

Course Outcomes:

On completion of the course, learner will be able to:

CO1: **Understand** the need for engineering drawing and design, applying sheet layout, line types, dimensioning, and projections of points and lines in first and third quadrants.

CO2: **Construct** engineering curves such as ellipses, parabolas, hyperbolas, helixes, and cycloids using appropriate methods.

CO3: **Develop** lateral surfaces for solids like cones, pyramids, prisms, and cylinders, applying industrial applications of these concepts.

CO4: **Apply** orthographic projection principles, creating accurate views from pictorial representations using first and third angle projection methods.

CO5: **Create** isometric projections of simple and compound solids using isometric scales and converting given orthographic views into isometric views.

Unit-1: Fundamentals of Engineering Graphics	**[6 Hrs.]**
Need of Engineering Drawing and design, Sheet layout, Line types and simple geometrical constructions, Dimensioning- Methods of Dimensioning. **Projections of points:** Theory of projections (reference plane and auxiliary planes, first and third angle method of projections), Projections of point only on first and third quadrant with all possible positions. **Projections of Line:** Projections of line [by first angle method of projection only] inclined to horizontal plane, frontal plane and both i.e oblique lines, on reference and auxiliary plane, true length of a line by rotation of a view and rotation of plane method, traces of lines *[Note: no application oriented questions]*	
Unit 2 – Engineering Curves and Development of Lateral Surfaces	**[8 Hrs.]**
Engineering Curves: Conic Section- Ellipse, Parabola and hyperbola by focus directrix and rectangle method, Helix for cylinder, involute of a circle, cycloid, and Archimedean spiral. *[Note: construction of tangent and normal is not expected in examinations]* Introduction to development of lateral surfaces and its industrial applications. Draw the development of lateral surfaces for cut sections of cone, pyramid, prism, Cylinder etc.	
Unit-3: Orthographic Projection	**[6 Hrs.]**
Principles of Orthographic Projections, types of orthographic projections–First angle and third angle projections, obtaining orthographic projections of given pictorial views by using first angle projection method along with sectional views. *[Note: only full sectional orthographic view to be asked for examination]*	
Unit-4: Isometric Projection	**[6 Hrs.]**
Principles of Isometric projection – Isometric and natural Scale, Isometric views of simple and compound solids, drawing isometric views from given orthographic views.	

Text Books:

1) Bhatt N.D and Panchal V.M, Elementary Engineering Drawing, (Plane and Solid Geometry), Charotar Publishing House, 53rd Edition.
2) Jolhe Dhananjay, Engineering Drawing with An Introduction to AutoCAD, Tata McGraw Hill Publishing Company Limited,5th Edition 2017.
3) K. Venugopal, K, (2015), "Engineering and Graphics", New Age International, New Delhi
4) Dhawan, R. K., (2000), "A Textbook Of Engineering Drawing", S. Chand, New Delhi

Reference Books:

1) Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
2) Madsen, D. P. and Madsen, D. A., (2016), "Engineering Drawing and design", Delmar Publishers Inc., USA
3) Rathnam, K., (2018), " A First Course in Engineering Drawing", Springer Nature Singapore Pte. Ltd., Singapore.
4) NPTEL Course on Engineering Graphics and Design, IIT Delhi by Prof. Naresh Varma Datla and Prof. S.R Kale, Link: https://onlinecourses.nptel.ac.in/noc24_me140/preview

Practical Session (Term work assessment guidelines):

Draw minimum two problems on each assignment on the A3 size drawing sheet.

Suggested List of Laboratory Experiments/Assignments:

Assignment 1: Draw projection of a line and find inclinations

Assignment 2: Construct any Engineering Curve

Assignment 3: Draw the development of lateral surface of a solid/ truncated solid

Assignment 4: Orthographic view of any machine element along with sectional view.

Assignment 5: Draw Isometric view for given orthographic views.

Assignment 6: Construct any one above assignments using CAD software.(Print on A4 size sheets)

Assignment 7: Write Autolisp Programme for any one 2-D drawing

List of Activities: (10 Mark Each)

1. **Engineering Drawing Interpretation and Problem-Solving:**
   Activity: Provide students with a complex orthographic drawing and ask them to analyze and interpret the missing views.
2. **Investigation-Based Orthographic to Isometric Conversion:**
   Activity: Give students real-life industrial components (e.g., a mechanical bracket, pipe joint, or valve body). They must create both orthographic and isometric drawings of the object.
3. **Safety Symbol Representation in Engineering Graphics:**
   Activity: Students must research and sketch engineering safety signs & symbols used in industries (e.g., hazard signs, chemical safety symbols).
4. **Case Study on Environmental Impact of Engineering Design:**
   Activity: Students analyze an engineering drawing of an industrial layout **(**e.g., a factory, chemical plant) and identify possible environmental & safety concerns**.** They must propose modifications for sustainability**.**
5. **Team-Based CAD Modeling and Design Challenge:**
   Activity: In teams, students design and model a simple mechanical/chemical equipment (e.g., a mixing tank, pump casing) using CAD software.

CO25101 : Fundamentals of Programming Language

Teaching Scheme:	Credit: 03	Examination Scheme:
TH: 02 Hrs./Week	TH Credit :02	CAA : 10 Marks
PR: 02 Hrs./Week		End-Semester : 60 Marks
		Termwork: 30 Marks

Prerequisite: Basic Knowledge of Computers.

Course Objective:

- Learn the structural components of a C Program
- Develop Problem-Solving Skills Using C
- Learn data structures like arrays and structures to obtain solutions to solve the problems.
- Learn concepts of modular programming to design the solutions to the problems.

Course Outcomes:

1. Develop C programs utilizing variables, operators and expressions effectively
2. Implement C programs using decision-making constructs, and looping mechanisms to solve computational problems efficiently.
3. Utilize arrays, strings, and structures in C programming to develop efficient and structured solutions.
4. Apply modular programming using function.

Course Contents

Mapping of Course Outcomes for Unit I	CO1

UNIT I	INTRODUCTION TO C PROGRAMMING	06 Hours

Overview of C: History and importance of C, Structure of C program, executing a C program, Algorithms and flowcharts

Constants, Variable and Data Types: Keywords and Identifiers, Constants, Variables, Data types, Declaration of variables, Assigning values to variables, Defining symbolic constants.

Input and Output Operations: Input output statements, Formatted input, Formatted output.

Operators and Expressions: Introduction, arithmetic, Relational, Logical, Assignment, Increment and Decrement and Bitwise operators, Arithmetic expressions, Evaluation of expressions, Precedence and Associativity of operators, Type conversions in expressions,

Mapping of Course Outcomes for Unit II	CO2

UNIT II	CONTROL STRUCTURES	06 Hours

Decision Making and Branching: Introduction, Decision making with IF statement, Simple IF statement, If-Else statement, Nested if-else statements, The Switch statement, The Conditional operator, The goto statement.

Decision Making and Looping: Introduction, The for statement, The while Statement, The do-while statement, nested loops, break and continue statements

Mapping of Course Outcomes for Unit III	CO3

UNIT III	ARRAY AND STRUCTURE	06 Hours

Characteristics of an array, One dimension and two dimensional arrays, concept of multi-dimensional arrays. Array declaration and Initialization. Operations on Arrays. Character and String input/output and String related operations. Introduction and Features of Structures, Declaration and Initialization of Structures, array of structures.

Mapping of Course Outcomes for Unit IV	CO4

UNIT IV	FUNCTIONS	06 Hours

Concept and need of functions. **Library functions:** Math functions, String handling functions, **User defined functions** - function definition, functions declaration, function call, scope of variables - local variables, global variables. **Function parameters**: Parameter passing- call by value & call by reference.

Books and Other Resources

Reference Books:

1. Kernighan B.W and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, 2015, Pearson Education India, ISBN: 978-93-3254-944-9.
2. Byron S. Gottfried," Schaum's outline of theory and problems of programming with C" 2nd Edition, McGRAW -HILL , ISBN 0-07-024035-3
3. Pradip Dey, Manas Ghosh, "Programming in C", 2nd Edition, 2018, Oxford University Press, ISBN: 978-01-9949-147-6.
4. Yashavant P. Kanetkar, "Let Us C", 16th Edition, 2019, BPB Publications, ISBN: 978- 93-8728-449-4.
5. Jacqueline A Jones and Keith Harrow, "Problem Solving with C", Pearson Education. ISBN: 978-93-325-3800-9.

References :

- http://www.studytonight.com/c/overview-of-c.php
- https://www.tutorialspoint.com/cprogramming

MOOCs Courses link:

- http://nptel.ac.in/courses/106105085/2
- http://nptel.ac.in/courses/106104074/1
- https://nptel.ac.in/courses/106/105/106105171
- https://nptel.ac.in/courses/106/106/106106212/

Guidelines for Term Work Assessment :

Term work assessment will be based on overall performance of Laboratory assignments performed by a students. Each Laboratory assignment assessment will assign grade/marks based on parameters, such as timely

completion, performance, efficient codes, and punctuality.

Guidelines for Practical Examination :

Problem statements will be formed based on assignments and performance will be evaluated by Internal and External Examiner. During practical assessment, maximum weightage should be given to satisfactory implementation of the problem statement. Relevant questions may be asked at the time of evaluation to test the student‘s understanding of the fundamentals, effective and efficient implementation.

Guidelines for Laboratory Conduction :

Operating System recommended :- 64-bit Open source Linux or its derivative

Programming tools recommended: - C, Visual Studio Code

Practical Assignments

1. Write a program that takes a student's marks as input and assigns a grade based on the following criteria:

   Grade: Distinction If per>=75
   Grade: A If per>=60 and Per<75
   Grade: B If per>=55 and Per<60
   Grade: Pass >=40 and Per<55
   Grade: Fail if per<40

2. Write C Program to print following patterns using loops.

```
    *
   * * *
  * * * * *
 * * * * * * *
```

3. Write a program to check whether the number is a prime number or not.
4. Write C program to find the largest and smallest element from an array.
5. Write C program to perform addition, transpose and multiplication of two 3X3 matrices using Two Dimensional Array.
6. Create a structure called "Student" with members name, age, and total marks. Write a C program to input data for five students and display the information.
7. Write C program to perform following operations without using standard string functions.
   i) Calculate Length of given string
   ii) Print string in the reverse order.
   iii) Copy one string to other
   iv) Concatenation
8. Write a function to find the factorial of the number.
9. Write a function to search an element from the array.

CO25102 : Introduction to Python Programming

Teaching Scheme: TH: 01 Hrs/Week PR: 02 Hrs/Week	**Credit: 02** TH Credit :01 PR Credit :01	**Examination Scheme:** Course Activity: 10 Marks Term Work: 50 Marks

Prerequisite: Students are expected to have a good understanding of basics of Programming and Problem Solving

Course Objective:

- To understand and implement various data types and structures in Python.
- To impart knowledge about problem-solving techniques using Python.
- To familiarize students with data types, operators, control structures, functions, and modules.
- To enhance skills in handling data structures, strings, and file operations.
- To explore foundational data science libraries: NumPy, SciPy, Pandas, and Matplotlib (without advanced visualization).

Course Outcomes:

At the end of the course, students will be able to:

CO 1: Apply Python's data types, strings, and numerical data to create efficient programs.

CO 2: Implement sequence types, mapping, control structures, and logical expressions to solve problems systematically.

CO3: Develop modular, reusable code using user-defined functions and apply regular expressions for data extraction and manipulation.

CO4: Use data science libraries (NumPy, SciPy, Pandas, Matplotlib) for basic data manipulation and analysis**.**

Course Activity :

The course coordinator should identify relative and innovative activities for course activity. Below are some suggested course activity for course coordinator

1. Mini Project using Python
2. Quiz in Python
3. NPTEL course on Python

Course Contents

Mapping of Course Outcomes for Unit I	**CO1**

UNIT I	**Data Types, Strings, and Numerical Data Fundamentals**	**03 Hours**

Basics of Python Programming: Writing and executing Python program, Literal constants, variables and identifiers, Data Types in Python: Mutable and Immutable Data Types, Type Conversion. String Handling: Creating, Indexing, Slicing, Built-in Functions, String Methods. Numerical Data: Integers, Floats, Complex Numbers, Mathematical Operations. Input operation, Comments, Reserved words, Indentation, Installation of Python.

Mapping of Course Outcomes for Unit II	**CO2**

UNIT II	**Control Flow, Sequences, and Mapping Structures**	**03 Hours**

Operators, Expressions and Operator Precedence, Sequence Types: Lists, Tuples, Ranges. Mapping Types: Dictionaries. Set Types: Sets and Frozen Sets. Boolean Types and Logical Operations. Conditional Statements: if, if-else, nested if-else. Looping Statements: for, while, nested loops, break, continue, pass.

Mapping of Course Outcomes for Unit III		CO3
UNIT III	**Functions, Regular Expressions, and Modules**	**03 Hours**

Functions: Definition, Call, Scope, Lifetime, Argument Passing, Return Statements, Recursive Functions, Lambda (anonymous) functions Regular Expressions: Introduction, Pattern Matching, Functions, Metacharacters. Modules and Packages in Python. Good Programming Practices.

Mapping of Course Outcomes for Unit IV		CO4
UNIT IV	**Data Science Foundations with Libraries**	**03Hours**

NumPy: Arrays, Operations, Indexing, Slicing, Mathematical Functions. SciPy: Functions for Scientific Computing, Optimization, Statistics. Pandas: DataFrames, Series, Data Analysis, File I/O Operations. Matplotlib: Plotting Graphs, Customization of Plots. Introduction to File Handling: Text and Binary Files.

Books and Other Resources

Text Books:

1. Reema Thareja, “Python Programming Using Problem Solving Approach”, Oxford University Press
2. R. Nageswara Rao, “Core Python Programming”, Dreamtech Press

Reference Books:

1. Fabrizio Romano, "Learning Python: Learn to code like a professional with Python – an open-source, versatile, and powerful programming language", Packt Publishing, 5th Edition, ISBN-13: 978-1789955750.
2. Paul Barry, "Head First Python: A Brain-Friendly Guide", O’Reilly Media, 2nd Edition, ISBN-13: 978-1491919538.
3. Martin C. Brown, "Python: The Complete Reference", McGraw Hill Education, 1st Edition, ISBN-13: 978-9387572942.

E-Resources:

1. Programming, Data Structures and Algorithms Using Python- https://onlinecourses.nptel.ac.in/noc24_cs45/preview
2. Programming in Python- https://onlinecourses.swayam2.ac.in/cec22_cs20/preview
3. The Joy of Computing using Python IIT Ropar- https://onlinecourses.nptel.ac.in/noc24_cs57/preview

Guidelines for Term Work Assessment :

Term work assessment will be based on overall performance of Laboratory assignments performed by students. Each Laboratory assignment assessment will assign grade/marks based on parameters, such as timely completion, performance, efficient codes, and punctuality.

Guidelines for Practical Examination :

Problem statements will be formed based on assignments and performance will be evaluated by Internal and External Examiner. During practical assessment, maximum weightage should be given to satisfactory implementation of the problem statement. Relevant questions may be asked at the time of evaluation to test the student‘s understanding of the fundamentals, effective and efficient implementation..

Guidelines for Laboratory Conduction :

Use of open source software is encouraged. Based on the concepts learned.
Operating System recommended :- 64-bit Open source Linux or its derivative Programming

Practical Assignments

1. A financial application requires user input for various calculations. The system must identify whether the input represents an integer (e.g., number of transactions), a float (e.g., account balance), a string (e.g., customer name), or a complex number (e.g., financial modeling parameter). Develop a solution that categorizes user input correctly for further processing.

2. Develop a security checkpoint program where users must enter a password. Assess its strength based on specific criteria and categorize it as weak, moderate, or strong. Provide feedback to help users enhance security.

3. A cybersecurity company needs to ensure secure key generation by verifying prime numbers before encryption. They require an efficient method to check if a number is prime. The process should be fast and provide clear feedback to users.

4. A supermarket tracks product stock levels using matrices. To manage inventory efficiently, it needs to update stock (matrix addition) and predict demand (matrix multiplication). Develop a solution that takes two matrices as input, processes them using nested loops, and displays the updated inventory and demand forecast.

5. A software engineer wants to compare the execution time of iterative and recursive algorithms. The Fibonacci sequence is a common test case for evaluating these two approaches. Write a Python program that generates the Fibonacci series up to a given number using both loops and recursion.

6. A user wants to organize their daily tasks efficiently. They can add new tasks, remove completed ones, sort tasks alphabetically, reverse the list for priority changes, and identify the longest or shortest tasks to adjust workload accordingly.

7. Extracting contact details from customer feedback is crucial for businesses. Given a paragraph of user-submitted text, identify and structure all phone numbers and email addresses using regular expressions.

   Ex. *"I recently visited your store and had an issue with my purchase. I tried calling customer support at (123) 456-7890 but couldn't get through. I also sent an email to support@example.com but haven't received a response. Please reach out to me at 987-654-3210 or john.doe@mail.com as soon as possible. Looking forward to your prompt assistance."*

8. A school wants to automate its grading system. Teachers enter student marks, and the system should calculate the total, average, and final grade. This will help in generating report cards efficiently. Define a Python function that takes marks for multiple subjects as input, calculates the total and average, and assigns a grade (A, B, C, D, F) based on predefined criteria. Display the student's performance summary.

9. A research lab deals with large datasets stored in numerical arrays. They require a Python program to manipulate these datasets by performing mathematical operations such as addition, multiplication, and reshaping. Write a Python program that creates a NumPy array and performs basic operations like addition, multiplication, and reshaping. Display the modified arrays as output.

10. A retail business stores sales data in CSV files. The management team needs to analyze this data by viewing key metrics such as total revenue, maximum and minimum sales, and trends. Write a Python program that loads a CSV file into a Pandas DataFrame. The program should display the first 10 rows,

extract column names, and calculate basic statistics such as total sales, highest and lowest sales figures, and average sales per day.

F Y B. Tech. (2025-26 Course)		
Indian Knowledge System (HS25102)		
Teaching Scheme: **Theory:** 2 Hours/Week	**Credits: 02**	**Examination Scheme:** **Term Work** 30 Marks **Oral Exam**: 30 Marks

Course Objectives:

1. To create awareness about the history and rich cultural heritage of Bharata.
2. To introduce the principles of Vedic mathematics for faster calculations.
3. To explore the contributions of traditional Bharatiya knowledge in science and astronomy.
4. To understand the contributions of traditional Bharatiya knowledge in engineering and technology.

Course Outcomes:

Students will be able to

1. Understand the antiquity of Bharatiya civilization, traditional knowledge systems, ancient education institutions, and contributions to life sciences, healthcare, and philosophy.
2. Apply the principles of Vedic mathematics for efficient problem-solving in arithmetic, algebra, geometry.
3. Analyze the scientific and astronomical advancements of ancient Bharata, including concepts of matter, gravity, aeronautics, and cosmology, and their relevance to modern science.
4. Explore the engineering, technological, and architectural innovations of ancient Bharata,

Course Syllabus

UNIT -I: **Bharatiya Civilization and Development of Knowledge System: (4 hours)**

Genesis of the land, Antiquity of civilization, the Saraswati-Sindhu Civilization, Traditional Knowledge System, The Vedas, Main Schools of Philosophy, Ancient Education System, the Takṣaśila University, the Nālandā University. Ethnic Studies, Life Science studies, Agriculture, Ecology and Environment, Ayurveda, Integrated Approach to Healthcare, Medicine, Microbiology, Surgery, and Yoga. Life and work of Rishi's, Brahmavadini.

UNIT-II: Vedic Mathematics: (8 hours)

Indian Mathematicians: Varahmihir, Brahmagupta, Srinivasa Ramanujan, Neelkanth Somayya, Bharti Krishna Tirtha, Introduction to sutras, and sub sutras, Methods for Addition, Multiplication, division, squaring and square roots, cube and cube roots, Factorization. Differentiation and Integration methods. Easy Solution of linear equations, Quadratic equations,

High-Speed Matrix. Algebra.
Vedic Geometry: Different forms of straight lines, The Triangle, The Cyclic Quadrilateral, Squares, and the Circle, Geometrical constructions (such as Altars), Transformation of simple shapes, Kalpa Sutras,Srauta Sutras and Sulbha Sutras.

UNIT-III: Science, Astronomy: (4 hours)

Concepts of Matter. Life and Universe, Gravity, Sage Agastya's Model of Battery, Velocity of Light, Vimāna: Aeronautics (Sundar Vimana,Rukma Vimana,Tripur Vimana Vedic Cosmology and Modern Concepts, Bhāratīya Kāla-gaṇanā, History and Culture of Astronomy, Sun, Earth, Moon, and Eclipses, Earth is Spherical and Rotation of Earth, Archeoastronomy.

UNIT-IV: Engineering, Technology and Architecture: (4 hours)

Pre-Harappan and Sindhu Valley Civilization, Laboratory and Apparatus, Juices, Dyes, Paints and Cements**,** Glass and pottery, Metallurgy, Engineering Science and Technology in the Vedic Age and Post-Vedic Records, Iron Pillar of Delhi, Rakhigarhi, Mehrgarh, Sindhu Valley Civilization, Marine Technology, and Bet-Dwārkā. Vastu Shastra,Architecture the Root of Civilization and Art work of Bharatiya Knowledge.

Textbooks:

1. Textbook on The Knowledge System of Bharata by Bhag Chand Chauhan,
2. Engineering and Technology in Ancient India by Ravi Prakash Arya
3. History of Science in India Volume-1, Part-1, Part-II, Volume VIII, by Sibaji Raha, et al. National Academy of Sciences, India and The Ramakrishna Mission Institute of Culture, Kolkata (2014).
4. Science and Technology in Ancient Indian Texts by Bal Ram Singh, Nath Girish. Umesh Kumar Singh
5. Vedic Mathematics, Swami Bharati Krishna Trithaji, Motilal Banarsidass, New Delhi.
6. Mayamatam – Indian Treatise on Housing, Architecture and Iconography (2 volumes), Bruno Daegens, Indira Gandhi National centre for Arts. 2007
7. Glimpse into Kautilya’s Arthashastra, Ramachandrudu P., Sanskrit Academy, Hyderabad. 2010
8. Supriya Lakshmi Mishra, Culture and History of Ancient India (With Special Reference of Sudras), 2020.
9. Ranganathananda, Swami. The Massage of the Upanishads. Bombay: Bharathya Vidya

Bhaven, 1985

Reference Books:

1. Pride of India- A Glimpse of India's Scientific Heritage edited by Pradeep Kohle et al. Samskrit Bharati (2006).
2. Vedic Physics by Keshav Dev Verma, Motilal Banarsidass Publishers (2012).
3. India's Glorious Scientific Tradition by Suresh Soni, Ocean Books Pvt. Ltd. (2010).
4. Modern Introduction to Ancient Indian Mathematics, T S Bhanumurthy, Wiley Eastern Limited, New Delhi
5. Advanced Vedic Mathematics, Rajkumar Thakur, Rupa Publications India Pvt. Ltd 2019
6. Vedic Geometry Course, S. K. Kapoor, Lotus Press
7. NPTEL Course: Indian Knowledge System (IKS): Concepts and Applications in Engineering https://onlinecourses.swayam2.ac.in/imb23_mg53/pre view
8. Rigvedadi Bhashya Bhumika: Swami Dayananda Saraswati publisher Arya samaj, Vedic Mission West Midlands.
9. Patanjali Yoga Sutra a commentary by Shri Shri Ravishankar, Arktos media.
10. NPTEL Course: Sohoni Pushkar, Introduction to the History of Architecture in India, IISER Pune, 2020. https://onlinecourses.nptel.ac.in/noc22_ar03/preview.

Examination Scheme:

1. Term Work: (30 Marks)

- **Attendance:** 5 Marks
- **Vedic Mathematics Test:** 10 Marks
- **Activity:** Participation in courses like NPTEL Art of Living Poster, Presentations, Models Making. 15 Marks

2. Oral Exam: (30 Marks)

Oral Examination will be conducted on the complete syllabus.

F Y B. Tech. (2025-26 Course)		
Physical Education Exercise and Field Activities (HS25104)		
Teaching Scheme: **PR:** 4 Hour/Week	**Credits: 02**	**Examination Scheme:** **TW- 50 Marks**

Course Objectives:

1. To develop physical fitness through structured training, conditioning, and injury prevention.
2. To gain practical knowledge and skills in various team and individual sports.
3. To learn the fundamentals of sports management, including event organization and safety measures.
4. To understand the role of nutrition and a balanced diet in maintaining overall fitness and athletic performance

Course Outcomes (COs): Upon completing this course, student will be able to

1. Explain the significance, history, rules, and modern trends in physical education and sports.
2. Demonstrate physical fitness training, conditioning techniques, and injury prevention strategies.
3. Develop skills and practical understanding of selected indoor and outdoor games, including rules and strategies.
4. Apply knowledge of physical education to organize and manage sports events, including warm-up exercises and game regulations.

Course Contents

1. Introduction to Sports and Health. (04 Hours)

Need and Importance, History, Types, Typical equipment and other requirements, Precautions, Benefits, Rules and regulations, and Modern trends of Physical Education, Sports (Through class room videos interaction/Self learning videos)

2. Physical Fitness Practice: (12 Hours)

1. Fundamental of Physical Education.
2. Physical Fitness Training and Conditioning.
3. Team and Individual sport
4. Spots Management and injury Prevention management.
5. Introduction to Nutrition and Balanced Diet for Fitness
6. General & Specific warm up exercises
7. Recreation Games and Fitness

3. Sports and Games (12 Hours)

Student should select one unique game out of the following.

Outdoor Games: Volleyball, Basketball, Softball Baseball, Football, Netball, Athletics, Cricket, Kho Kho, Kabaddi. .

Indoor Games: Yoga, Badminton, Table Tennis, Chess.

Students will submit a report on a specific game consisting following points
History of game, diagram of ground with measurements, Team strength, Skills, and five award winnings players with suitable photographs, etc.

Students will organize the sports competitions by

1. **Creating a schedule:** Plan out the timing and sequence of event
2. **Preparing the Venue:** Ensure that the playing fields and facilities are in good condition.
3. **Assigning officials**: Ensure that there are sufficient referees, umpires and scorers.
4. **Conducting** the competition successfully and prepare the necessary reports.

Specially abled students will be given a choice of their sports in which they are comfortable along with opportunities in organization and management of these competitions.

Text Books:

1. Physical Education: A Handbook for Teachers by A.V. Bapat
2. DK (2021) Know your sport, DK India.
3. J Bains (2019), Essential of physical education, Kalyani publication.
4. Physical Fitness and Conditioning by Brian J. Sharkey
5. Team Sports: A Comprehensive Guide by Richard D. Ginsburg

Reference Books:

1. William Martin (2023), the book of sports.
2. Om book editorial team (2016), Encyclopaedia: Sports Encyclopaedia Om book International.
3. V.K.Sharma (2022), Health and physical education, new sarawati house India Pvt. Ltd.
4. Youtube and other online resources.

BS25102 - Engineering Mathematics-II (Ordinary Differential Equations, Integral Calculus, and Statistics)		
Teaching Scheme **Theory: 3 Hours/Week** **Tutorial: 1 Hour/Week**	**Credits** **03+01=04**	**Examination Scheme** **Course Activity: 10 Marks** **In-Semester: 30 Marks** **End-Semester: 60 Marks** **Term Work: 30 Marks**

Prerequisites:
Differentiation, Integration, Differential Equations.

Course Objectives:
To help the students with mathematical modeling of physical systems using differential equations advanced techniques of integration, tracing of curves, multiple integrals, and their applications. The aim is to equip them with the methods to understand advanced-level mathematics and its applications that enhance thinking power, which is useful in their disciplines.

Course Outcomes (COs): The students will be able to
CO1: Solve first-order first-degree differential equations using suitable methods.
CO2: Apply the concept of differential equations for various physical systems such as Newton's law of cooling, electrical circuits, rectilinear motion, mass-spring systems, and heat transfer.
CO3: Represent, visualize, and analyze Statistics data and learn basic concepts of probability.
CO4: Evaluate definite improper integrals using techniques like Gamma, Beta function, DUIS, and Error functions.
CO5: Sketching the curve of a given equation and measuring the arc length of various curves.
CO6: Evaluate multiple integrals and apply them to calculate area, volume, Center of gravity, and moment of inertia.

Course Contents

Unit 1: First Order Ordinary Differential Equations [07 Hours]
Formation of Differential Equation, Exact differential equations, Equations reducible to exact form. Linear differential equations, Equations reducible to linear form, Bernoulli's Equation.

Unit 2: Applications of Differential Equations [07 Hours]
Applications of Differential Equations to Orthogonal Trajectories, Newton's Law of Cooling, Kirchhoff's Law of Electric Circuits, Rectilinear Motion, One Dimensional Conduction of Heat.

Unit 3: Statistics and Probability [07 Hours]

Importance of Statistics in Engineering. Data Types, Measures of Central Tendency and their Applications. Probability Theory. Classical definition, Sample Space. Conditional Probability, Bayes Theorem, Applications.

Unit 4: Integral Calculus **[07 Hours]**

Reduction Formulae, Beta and Gamma functions, Differentiation under Integral Sign and Error functions.

Unit 5: Curve Tracing **[07 Hours]**

Tracing of Curves Cartesian, Polar and Parametric curves, Rectification of curves.

Unit 6: Multiple Integrals and their Applications **[07 Hours]**

Double and Triple integrations, change of order of integration, Applications to find Area, Volume, Mass, Centre of Gravity and Moment of Inertia.

Textbooks:

1. Higher Engineering Mathematics by B. V. Ramana 1st ed (Tata Mcgraw Hill, 2011)
2. Applied Mathematics (Vol. I & Vol. II) by P.N.Wartikar and J.N.Wartikar (Pune Vidyarthi Griha Prakashan, 2009.)
3. Engineering Mathematics: A tutorial approach by Ravish R Singh and Mukul Bhatt (1st ed, McGraw Hill Education India Pvt Ltd, 2013)

Reference Books:

1. Higher Engineering Mathematics by B. S. Grewal (44th ed: Khanna Publication, 2019).
2. Advanced Engineering Mathematics by Erwin Kreyszig (10th ed: Wiley India, 2023).
3. Advanced Engineering Mathematics by Peter O'Neil (8th ed: Cengage Learning, 2024)
4. Schaum's Outlines: Differential Equations by Richard Bronson and Gabriel B. Costa.
5. Schaum's Outlines: Calculus by Frank Ayres and Elliott Mendelson.
6. Fundamentals of Mathematical Statistics by S. C. Gupta and V. K. Kapoor (Sultan Chand & Sons, 2020)

Guidelines for Tutorial and Term Work:

1. The tutorial for the subject shall be engaged in a minimum of three batches (Batch size of 23 students maximum) per division.
2. Term work shall consist of six assignments, and on each Unit-1 to Unit-6, and is based on Performance and continuous internal assessment.

BS25103: Engineering Physics		
Teaching Scheme: **TH : 02 Hrs./week** **PR : 02 Hrs./Week**	**Credits** **03**	**Examination Scheme:** **Activity: 10 Marks** **End Semester: 60 Marks** **TW: 30 Marks**

Course objectives

1. To escalate conceptual understanding of Optics, Semiconductors & Quantum mechanics.
2. To inculcate the importance of Physics concepts in diverse engineering applications.
3. To explore developments in Physics via. Lasers, Optical Fibre, and Superconductivity.

Course Outcomes: After learning this course, pupils (stakeholders) will be able to:

1. Understand the optical phenomena including interference and polarization, and relate them to various engineering applications.
2. Learn laser mechanism, optical fibre and their prominent applications in various fields.
3. Evaluate the advent of quantum mechanics and distinguish the wave nature of a matter particle at an atomic dimension.
4. Apply concepts of semiconductors for the explanation of charge carrier kinetics in electronic devices and analyse properties of superconductors and their applications in cutting-edge technologies

Course content

Unit I: Wave Optics (07 Hrs.)

Interference: Introduction to interference, Constructive and destructive interference, Path difference and phase difference, Interference in a thin film of uniform thickness (with derivation), Interference in a thin film wedge shape (qualitative), Applications of interference: testing optical flatness, anti-reflection coating. applications of Newton's Ring: Determine the unknown wavelength, numerical.

Polarization: Polarization of light, Malus law, Double refraction, geometry of calcite crystal, Huygen's theory of double refraction, Specific rotation (qualitative only), Optically active materials, numerical.

Unit II: Laser and Optic Fiber (07 Hrs.)

Laser: Introduction, interaction of light with matter-absorption, spontaneous emission, stimulated emission, population inversion, metastable state, active system, resonant cavity, characteristics of the laser, Ruby laser, He-Ne laser. Applications of lasers: Holography, IT, industrial, medical.

Optic Fiber: Introduction, structure of optical fiber, Acceptance Angle, Acceptance Cone, Numerical Aperture and its derivation, Advantages of optical fiber communication over conventional methods, numerical.

Unit III: Quantum Mechanics (07 Hrs.)

Introduction, need of quantum mechanics, wave-particle duality of radiation & matter, De-Broglie hypothesis, De-Broglie wavelength in terms of kinetic energy and potential, concept of the phase, and group velocity (qualitative only), Heisenberg Uncertainty Principle, Properties of matter-wave, Wave-function, and its physical significance, Schrodinger's equations: time-independent and time-dependent, Application of Schrodinger's time independent wave equation - Particle enclosed in infinitely deep potential well (Particle in Rigid Box), Tunneling effect: tunnel diode and numerical.

Unit IV: Semi- and Superconductor Physics (07 Hrs.)

Semiconductor Physics: Introduction, classification of solids based on band theory. Conductivity of conductors and semiconductors, Hall effect: Derivation for Hall voltage, Hall coefficient, applications of Hall effect, Formation of PN junction with band diagram (forward and reverse bias), Solar cell (basic principle with band diagram) I-V Characteristics.

Superconductivity: Introduction, superconductivity, Properties: Zero electrical resistance, Meissner effect, Critical magnetic field, Persistent current, Type I and Type II superconductors, Applications of superconductors: SQUID, Maglev, etc.

Books:

Text Books:

1. Engineering Physics - Avadhanulu, Kshirsagar, S. Chand Publications
2. A textbook of optics - N Subrahmanyam and Brij Lal, S. Chand Publications
3. Engineering Physics - Gaur, Gupta, Dhanpat Rai, and Sons Publications

Reference Books

1. Fundamentals of Physics, Resnick, and Halliday (John Wiley and Sons)
2. Optics, Jenkins and White (Tata McGraw Hill)
3. Principles of Physics, Serway, and Jewett (Saunders College Publishing)
4. Introduction to Solid State Physics, C. Kittel (Wiley and Sons)
5. Principles of Solid-State Physics, H. V. Keer, New Age International
6. Laser and Non-Linear Optics, B. B. Laud (Oscar publication)

List of experiments (Any 8)

1. To determine the radius of curvature of a plano-convex lens by Newton's ring method.
2. To determine wavelength by using a plane diffraction grating.
3. Determination of specific rotation of a solution with Laurent's Half Shade Polarimeter.

4. Experiment based on Laser (Thickness of wire, determination of grating element).
5. To determine the energy band gap of a given semiconductor.
6. To study I-V characteristics and determine the fill factor of a solar cell.
7. To determine the Hall coefficient and charge carrier density.
8. To determine ultrasonic velocity in liquid using an ultrasonic interferometer and its compressibility.
9. To verify cosine law of Malus.
10. Determination of electrical resistivity of given semiconductor using four probe method.
11. To find out the Magnetic susceptibility of a given material.
12. Determination of Acceptance angle and Numerical Aperture using fiber optic cable.
13. Study of quantum tunneling effect using tunnel diode.
14. Determination of angle of divergence of a laser beam using DIODE laser mains operated.
15. Determination of wavelength of laser light using semiconductor laser diffraction
16. To determine the absorption coefficient of the sound of a given material.

First Year B. Tech. (2025 Course)		
EL25101: Basic Electrical Engineering		
Teaching Scheme: **TH: 02 Hrs/Week** **PR: 02 Hrs/Week**	**Credits:03**	**Examination Scheme:** **Course Activity: 10 Marks** **End-Semester Exam: 60 Marks** **Term-Work: 30 Marks**

Prerequisite Courses:

Fundamentals of Physics**,** Electron theory and Electromagnetism.

Companion Course, if any: Laboratory Practical

Course Objectives:

1. To introduce fundamental concepts of DC circuits, Star-Delta transformation, KCL, KVL and theorems to find the solution of circuits.
2. To impart knowledge of electromagnetic circuits and differentiate electromagnetic circuits with electric circuits.
3. To impart fundamentals of Electrostatics and AC fundamentals to determine various parameters of alternating sinusoidal quantities, differentiate various types of phase angles and perform various arithmetic operations of phasor quantities
4. To provide knowledge about fundamental parameters of single phase AC circuits consists of resistance, inductance and capacitance with different waveforms and phasor diagrams.

Course Outcomes

On completion of the course, learner will be able to

CO-1: Apply star-delta transformation techniques to simplify the resistive circuits and find out the solution of DC circuits by using KVL, KCL and different network theorems

CO-2: Apply the knowledge of electromagnetic circuits to calculate various parameters and to differentiate magnetic circuits with electrical circuits.

CO-3: Apply the knowledge of Electrostatics and AC fundamentals to determine various parameters of alternating sinusoidal quantities, differentiate various types of phase angles and perform various arithmetic operations of phasor quantities.

CO-4: Identify type of single phase AC circuits consisting of resistance, inductance and capacitance with different waveforms and phasor diagrams and calculate various parameters of it.

Course Contents

Unit I: D.C Circuits (07 Hrs)

Classification of electrical networks, classification of voltage as well as current sources: ideal and practical, numerical based on source transformation techniques, numerical based on simplification of networks to find equivalent resistance by using Series and parallel combinations, Star to Delta and delta to star conversion (including derivations). Kirchhoff's Voltage and Current Laws to find solutions of networks using loop analysis, Superposition theorem, Thevenin's theorem and Norton's theorem.

Unit II: Electromagnetism (07 Hrs)

Magnetic effect of an electric current, cross and dot conventions, right hand thumb rule, nature of magnetic field of long straight conductor, solenoid and toroid. Definition and units: magnetomotive force, flux, flux density, reluctance, permeability and field strength, and their relationships. Series magnetic circuit, only theory of parallel magnetic circuit and comparison of electric circuit with magnetic circuit. Force on current carrying conductor placed in magnetic field, Fleming's left hand rule, Faraday's laws of electromagnetic induction, Fleming's right hand rule, statically and dynamically induced e.m.f, self and mutual inductance, coefficient of couplings. Energy stored in a magnetic field.

Unit III: Electrostatics and AC Fundamentals (07 Hrs)

A) Electrostatics: Electrostatic field, electric flux density, electric field strength, absolute permittivity, relative permittivity and capacitance. Capacitor, capacitors in series and parallel, energy stored in capacitors, charging and discharging of capacitors (no derivation) and time constant. **(03 Hrs)**

B) AC Fundamentals: Sinusoidal voltages and currents, their mathematical and graphical representation, Concept of cycle, Period, frequency, instantaneous, peak (maximum), average and r.m.s. values, peak factor and form factor. Phase difference, lagging, leading and in phase quantities and phasor representation. Rectangular and polar representation of phasor.**(04 Hrs)**

Unit IV: Single Phase AC Circuits (07 Hrs)

Study of AC circuits consisting of pure resistance, pure inductance, pure capacitance, series R-L, R-C and R-L-C circuits, phasor diagrams, voltage, current and power waveforms, resonance in series and parallel RLC circuits, concept of impedance and admittance, concept of active, reactive, apparent, complex power and power factor, only theory of Parallel AC circuits.

Books & Other Resources:

Text Books:

1. Principles of Electrical Engineering, V. D. Toro,Prentice Hall India, 1989
2. Theory and Problems of Basic Electrical Engineering, D. P. Kothari, I.J. Nagrath, PHI Publication
3. Basic Electrical Engineering,V.K. Mehta, Rohit Mehta, S Chand Publications
4. A text book on electrical technology Vol-I, B. L. Theraja

Reference Books:

1. Electrical technology, H Cotton, CBS Publications
2. Fundamentals of Electrical Engineering‖, L. S. Bobrow, Oxford University , 2011.
3. Electrical and Electronics Technology‖, E. Hughes, Pearson, 2010.
4. Basic Electrical Engineering, D. C. Kulshreshtha, McGraw Hill, 2009

Guidelines for Laboratory - Term work Assessment:

1. The distribution of weightage of term work marks should be informed to students before the start of the semester.
2. Term work assessment should be on a continuous basis. At frequent intervals students are expected to inform about their progress/lagging.

Guidelines for Laboratory Conduction:

1. DO's and DON'TS, along with precautions, are needed to be displayed at prominent locations in the laboratory.
2. Students should be informed about DO'S and DON'T and precautions before performing.

Guidelines for Students Lab Journal:

The Student's Lab Journal should contain following related to every experiment –

1. Theory related to the experiment.
2. Apparatus with their detailed specifications.
3. Connection diagram /circuit diagram.
4. Observation table/ simulation waveforms.
5. Sample calculations for one/two readings.
6. Result table.
7. Graph and Conclusions.
8. There should be continuous assessment for the TW.
9. Assessment must be based on understanding of theory, attentiveness during practical, understanding Session, how efficiently the student is able to make connections and get the results, and timely submission of journals.

LIST OF PRACTICALS (Any 08 to be performed by the student)

1. To study safety precautions while working on electrical systems, handling various equipment such as multimeter, ammeters, voltmeters, wattmeter, real life resistors, inductors and capacitors.
2. To demonstrate different types of electrical protection equipment such as fuses, MCB, MCCB, and ELCB.
3. To verify KVL and KCL.
4. To verify the Superposition theorem.
5. To verify Thevenin's theorem in a DC network.
6. To verify Norton's theorem in a DC network.
7. To observe charging and discharging response of capacitor on storage oscilloscope using DC step input.
8. To observe voltage and current waveforms of series RL and series RC circuit on storage oscilloscope and verify the calculated value of phase angle of impedance with the measured value of phase angle between voltage and current waveforms.
9. To measure mutual induced voltage by using a single phase transformer .
10. To study residential Electricity Bill.
11. To measure insulation resistance of three core cables by using Megger.
12. To draw and make connections of Staircase wiring and Godown wiring.

Note :

The list of experiments is not limited to the above, but a course coordinator may design a few new experiments based on recent technologies/trends in the relevant Engineering Domain. However the course coordinator needs to get approval by the Program Assessment Committee and Chairman BOS/HOD well in time.

Course Activity (Any one of the following) :

1. Concept test
2. Powerpoint presentation

Course Name with Code: Applied Mechanics (CE25101)		
Teaching Scheme: **TH: 02 Hours/week** **PR: 02 Hours/Week**	**Credits** **03**	**Examination Scheme:** **Activity: 10 Marks** **End Semester: 60 Marks** **TW: 30 Marks**

Prerequisites:

Basic principles of trigonometry, Algebra, Linear differentiation and integration, Principles of Physics (equations of motions)

Course Objectives:

1. To impart knowledge about force systems and methods to determine resultant of force system.
2. To impart knowledge about Principle of equilibrium to determine- reaction of beams, support reactions, friction forces.
3. To study the structural members and calculate member forces in trusses, cables and frames.
4. To train students to solve application problems related to particle mechanics using principles of kinematics, kinetics and work, power and energy.

Course Outcomes:

On completion of the course, learner will be able to–

CO1: Determine resultant of various force systems and centroid of area.

CO2: Determine reactions of beams, sphere, strings and friction forces using principles of equilibrium.

CO3: Solve trusses, cables for finding member forces and apply principles of equilibrium.

CO4: Calculate position, velocity and acceleration of particle using principles of kinematics & Kinetics.

Course Contents

Unit I: Resolution and Composition of Forces & Centroid of Plane Lamina (07 Hours)

Introduction and Principle of statics, force systems, resolution and composition of forces, resultant of concurrent forces, moment of a force, Couple, Varignon's theorem, Centroid of plane lamina basics and numerical.

Unit II: Equilibrium and Friction (07 Hours)

Equilibrium

Free body Diagram, equilibrium of concurrent, parallel forces in a plane, equilibrium of general forces in plane equilibrium of three forces. Types of beams: simple and compound beams, type of loads, types of supports.

Friction- Introduction to friction, Law of friction, application of friction on Blocks and ladder, application to flat belt.

Unit III: Analysis of Structures (07 Hours)

Analysis of plane trusses by method of joint, analysis of plane trusses by method of section, cables with supports at same and different level subjected to point loads, Analysis of simple plane frame.

Unit IV: Kinematics & Kinetics of Particle (07 Hours)

Kinematics of linear motion, constant acceleration, motion under gravity, equations of motions in cartesian and path coordinates for curvilinear motion, projectile motion.

Newton's second Law and its applications to rectilinear motion, curvilinear motion, and introduction to work energy principle and impulse momentum equation, direct and central impact, coefficient of restitution.

Books & Other Resources:

Text Books:

1. Vector Mechanics for Engineers STATICS - Beer & Johnston, Tata McGrawHill Publications, 12th Edition, (2018)

2. Vector Mechanics for Engineers DYNAMICS - Beer & Johnston, Tata McGrawHill Publications, 12th Edition,(2018)

3. Engineering Mechanics: Statics and Dynamics - A. K. Tayal, Unmesh Publications, 11th Edition, (2000)

4. Engineering Mechanics- Bhavikatti , Newage Publications, 8th Edition, (2017)

Reference Books:

1. Engineering Mechanics -Singer Harper & Row, Hill Publishers, 3rd Edition, (1975)

2. Engineering Mechanics - Meriam and Crage , Wiley Publications, 9th Edition, (2020)

3. Engineering Mechanics -Timoshenko and Younge, McGraw Hill Publications, 5th Edition, (2013)

4. Introduction of Engineering Mechanics- S. Rajshekaran and G Sankarasubramanian,

Vikas Publications, 1st Edition, (2011)

5. Engineering Mechanics- R.S. Khurmi, S. Chand Publications, 3rd Edition, (2019)

Laboratory Course

Guidelines for Instructor's Manual

An instruction manual with aim, objective, apparatus, procedure and calculations to be performed for each experiment to be provided for students called as Lab Manual. Every year problems for assignment should be changed. It is advisable to give different data to different batches.

Guidelines for Student's Lab Journal

Journal should be hand written Guidelines for Lab /TW Assessment Each and every experiment should be assessed and given mark out of 10. Finally, the marks can be converted as per given in the structure.

Suggested List of Laboratory Experiments/Assignments

1. To verify the law of polygon of forces by using universal force table.

2. To determine support reaction of cantilever or simply supported beams using beam apparatus.

3. Determine the coefficient of friction using belt.

4. To study the curvilinear motion of the particle.

5. Determine the coefficient of restitution using different materials.

6. Determine the reactions at support for the loaded simply supported truss.

Activity:

Assignment of minimum five problems on every unit to be solved during practical.

Course Coordinator PAC-1 PAC-2 Dept. Autonomy Coordinator BOS Chairman

Subject: Electronics Measuring Instruments & Tools (EMIT)(ET25102)		
Teaching Scheme: **TH: 03 Hrs./week** **PR: --**	**Credits** **03**	**Examination Scheme** **Course Activity: 10 Marks** **In - Semester: 30 Marks** **End - Semester: 60 Marks**

Pre-Requisites: NIL

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

CO1: Identify various electronic components and their specifications.

CO2: Study basic analog circuits using OPAMP and uses in measuring instruments.

CO3: Study performance parameters of instrument and process of calibration

CO4: Study different laboratory instruments and component testers.

CO5: Apply tools to design printed circuit boards for simple circuits and learn emerging trends in Electronics and Telecommunication.

CO6: Describe the basic principles of communication systems.

Syllabus

Module 1 (6 Hrs.)

Introduction to Components: Resistors, inductors, Capacitors, ICs, Breadboards, PCBs, ICs, IC sockets, cables and connectors, Diodes, Transistors, and 7-segment displays. Introduction to testing of components: Active & Passive components testing, IC testers.

Module 2 (06 Hrs.)

Operational amplifier

Differential amplifiers, Functional block diagram of operational amplifier, ideal operational amplifiers and parameters, OP AMP applications: Op-amp as Inverting and Non-inverting amplifier, Summing amplifier, Comparator, Integrator and differentiator.

Module 3 (06 Hrs.)

Basics of Measurement

Introduction to Electronic measurement and its advantages, Functional Elements of an instrument, Performance characteristics: Calibration, Static characteristics and Dynamic characteristics, Instrument Classification, Methods of measurement: Direct and indirect measurement method.

Module 4 (06 Hrs.)

Instruments and their working: CROs, DSOs, DVMs, DMMs, Frequency counters, Waveform generators, working with power supplies, Assembling and Disassembling a gadget/ simple instrument.

Module 5 (6 Hrs.)

Introduction to PCB Design: Soldering and desoldering techniques, SMD soldering methods, bread boarding, general-purpose PCBs, PCB artwork, Various types of Printed Circuit Boards (Single-Sided Boards, double-sided plate-through-hole Boards, multilayer Boards), study of Packages of Electronic Components, study of SMD Components, process of PCB design and product development flow, Design of PCBs for simple circuits, PCB Drills, and Hand tools.

Module 6

Communication Systems (06 Hrs.)

Basic block diagram of communication system, Modes of Communications, Communication Media: Types of Wired and Wireless media, Electromagnetic Spectrum, Allotment of frequency band for different applications, necessity of modulation, Introduction to AM and FM Modulation, Modulation index, spectrum, waveforms and

equations of AM and FM wave, comparison between FM and AM.
Text Books: 1. Instrument manuals published by respective Manufacturers. 2. Kalsi H.S "Electronic Instrumentation", Tata McGraw Hill, 2004. 3. Thomas. L. Floyd "Electronics Devices", 9th Edition, Pearson 4. R.P. Jain, "Modern Digital Electronics", 4th Edition, Tata McGraw Hill 5. Kennedy and Davis "Electronic Communication Systems", 4th Edition, Tata McGraw Hill Reference Books: 1. Thomas. L. Floyd, "Digital Fundamentals", 11th Edition, Pearson 2. J. Schiller, "Mobile Communication", 2nd Edition, Pearson **Other Resources:** 1. Lab charts/manuals. 2. Equipment manuals. 3. Datasheets.

HOD E&TC **Dr BH Patil**	**Dean Autonomy** **Dr CB Nayak**	**Dean Academics** **Dr SM Bhosle**	**Principal** **Dr SB Lande**

Subject: Workshop E&TC (ET25103)		
Teaching Scheme: **Theory: 01 Hr./week** **PR: 02 Hrs./week**	**Credits: 02**	**Examination Scheme** **CAA: 10 Marks** **Term work: 50 Marks**

Course Objectives:

1. Familiarise the versatile MATLAB programming language
2. Apply the fundamental techniques through MATLAB Programming
3. Familiarise the versatile Arduino programming language
4. Apply the fundamental techniques through Arduino Programming

Course Outcomes: On completion of the course, the learner will be able to–

CO1: Be able to use MATLAB for interactive computations and apply the knowledge and techniques for the implementation of simple programs on MATLAB.

CO2: Understand the fundamentals of Arduino and apply the knowledge and techniques for the implementation of simple programs on Arduino.

Module I: MATLAB and SIMULINK (7 Hours TH, 14 Hours WS)

MATLAB: Introduction to MATLAB, Data Types and Variables, Basic MATLAB Functions, Script Files, Arrays Operations, Graphics.

MATLAB SIMULINK: Basic Waveforms, Trigonometric Functions, Differential Equations.

Module II: Introduction of Arduino (7 Hours TH, 14 Hours WS)

Introduction and Familiarization: Hardware Overview, Download and Install the Arduino IDE, Arduino IDE and Sketch Overview, Understanding Arduino Syntax.

Basics: Understanding and Using Variables, Blinking an LED, digital Read() and Serial Port Communication, analog Read() and Serial Port Communications, Reading Analog Pins and Converting the Input to a Voltage, Fade an LED with Pulse Width Modulation using analogWrite().

Implementation: Blink an LED Without using the delay() Function, Using Buttons, State Change Detection and the Modulo Operator, Debouncing a Button, Analog I/O and Serial Communications

Study Resources:

1. MATLAB Onramp: Learn the basics of MATLAB through this introductory tutorial on commonly used features and workflows. Get started with the MATLAB language and environment so that you can analyze science and engineering data. https://MATLABacademy.mathworks.com/details/MATLAB-onramp/gettingstarted
2. MATLAB Fundamentals: Learn core MATLAB® functionality for data analysis, visualization, modeling, and programming. Implement a common data analysis workflow that can be applied to many science and engineering applications. https://MATLABacademy.mathworks.com/details/MATLAB-fundamentals/mlbe
3. "Internet of Things: Case Studies", Libelium Inc, White papers, Spain http://www.libelium.com/resources/case-studies
4. NPTEL Course on "Introduction to IoT", by Prof. Sudip Misra, IIT Kharagpur Link of the Course: https://nptel.ac.in/courses/106105166

List of Practical:

1. Write a basic MATLAB program to declare variables, perform basic operations on variables and use the trigonometric function (Sine/Cosine) & plot the graph.
2. Write a MATLAB program to define an array & perform various operations. Create a matrix & perform the addition of two matrices.
3. Write MATLAB code to print the sum of the first 10 natural numbers using (For Loop).
4. Create a SIMULINK model to generate basic waveforms.
5. Create a SIMULINK model for a given differential equation.
6. Interface LED with Arduino & write a program for LED Blinking with a delay function.
7. Interfacing various sensors like temperature, humidity, and buzzer with Arduino board.
8. Interface LED with Arduino & write a program to fade an LED with Pulse Width Modulation.
9. To study block-wise construction of an analog oscilloscope & function generator.
10. To study block-wise construction of a multimeter & frequency counter.
11. Measurement of voltage, frequency & phase with the help of CRO.
12. Study of various types of Active & Passive Components based on their ratings.
13. Identification of various types of Printed Circuit Boards (PCB) and soldering Techniques.

HS25101: Communication and Professional Skills F.Y. B. Tech (Sem-I and Sem-II)		
Teaching Scheme: **Th.: 2 Hr. / Week**	**Credits: 02**	**Evaluation Scheme:** **Term Work: 30 Marks** **Oral Test: 30 Marks**

Course Objectives:

1. To communicate well using meaningful sentences for conversation or speech
2. To comprehend communication process and write effectively and enhance formal communication
3. To acquire better presentation skills and participate in healthy discussion: both formal and informal among peers
4. To be confident in facing interviews, acquiring professional skills and be industry ready

Course Outcomes: On completion of the Course, learner will be able to:

CO1: Communicate with their peers and professionals confidently.

CO2: Understand how to analyse their personality using SWOC analysis technique.

CO3: Develop presentation and participate in group discussion.

CO4: Understand and implement etiquette in workplace and in society at large.

Course Contents

Unit I: English Grammar and Linguistic Competence Building [07 Hrs.]

Tenses in English, Modal Auxiliary Verbs, Enhancement of Word Power, Essentials of Pronunciation in English

Unit II: Language Skills and Presentation Skills Enhancement [07 Hrs.]

Listening, Speaking, Reading and Writing, Making an Effective Presentation, Group Discussion: Dos and Don’ts of Group Discussion

Unit III: Business Writing [07 Hrs.]

Letter Writing, Resume Writing, Report Writing, Email Writing

Unit IV: Job Readiness [07 Hrs.]

Professional Etiquette, SWOC Analysis, Types of Interviews, Interview Skills, Mock Interview, Facing an Interview

- **Evaluation Scheme**

- **Term Work: 30 Marks—**Term work will be evaluated based on individual and group activities assigned like group discussion and presentation.
- **Oral Test: 30 Marks**

Textbooks:

- *Effective Communication Skills*, Kulbhushan Kumar, Khanna Publishing House, New Delhi, 2018.
- *Communication Skills*, Pushpa Lata and Sanjay Kumar, Oxford University Press, 2015.
- *Communication Skills for Technical Students* by T. M. Farhatullah, Orient Longman, 2002.
- *Communication for Business: A Practical Approach*, Shirley Tailor and V Chandra, Pearson, 2010.

- **Reference Books:**

- *Corporate Communication*, Jaishri Jethwaney, Sage, 2018.
- *Written Communication in English*, Saran Freeman, Orient Longman, 2010.
- *Business Correspondence and Report Writing*, R. C. Sharma and Krishna Mohan, Tata McGraw Hill, 2017.
- *A Foundation Course in Human Values and Professional Ethics*, R R Gaur and R Sangal and G P Bagaria, Excel Books, 2010.
- *Functional Grammar and Spoken and Written Communication in English*, Bikram K Das, Orient Blackswan, 2006.
- *77 Ways to Perfect Your Communications Skills: Enhancing Your Personal and Professional Relationships*, Frank H Leone, 2020.
- *Handbook of Pronunciation of English Words*, J Sethi, Eastern Economy Edition, 2010.

FY B. Tech Subject Name: Art and Culture Subject Code: -HS25103		
Teaching Scheme: **PR: 04 Hrs./Week**	**Credits: 02**	**Examination Scheme:** **TW: 50 Marks**

Introduction:

Cocurricular activities like music, art, drama, and clubs help students discover and develop their passions, creativity, and talents. Engaging in activities outside the classroom can reduce stress and mental fatigue, helping students maintain better focus in their studies.

Course Objectives:

1. To introduce students to various co-curricular activities across music, dance, theatre, literature, fine arts, and applied arts, emphasizing their significance in holistic development.
2. To provide hands-on experience in performing and creative arts, including singing, instrumental music, dance, drama, literary events, and art & craft activities, enabling students to develop skills and confidence.
3. To encourage active participation in clubs and competitions, fostering teamwork, leadership, and creativity in both individual and group settings.
4. To enhance students' ability to express themselves through performing arts, literary activities, and digital media, improving communication and presentation skills.

Course Outcomes:

On completion of the course, learner will be able to –

CO1: Express themselves creatively.

CO2: Demonstrate teamwork, organizational skills and collaboration with peers.

CO3: Develop a deeper understanding of storytelling through movement, acting, and visual arts.

CO4: Enhance experiential learning through use of technology for effective communication.

CO5: Utilize acquired skills in cultural, artistic, and literary fields for career development, social engagement, and lifelong learning.

Course Contents

Unit I: Introduction to Co-curricular Activities (6 Hrs.)

Types, Theory (of Music, Dance, Theater, Literary, Fine Art, Applied and Other Forms), Programmes and Competitions, Benefits, Professional Aspects

Unit II: Performing Activities (16 Hrs.)

(a) Music and Singing: Singing and Instrumental (Percussion Group: Keyboard, Tabla, Flute etc.) and String Group: (Tambora, Veena, Guitar, Violin, Banjo etc.), Folk Type: Dafali, Ektari, Dholki. Types: Classical, Semi-classical, and Westerns
(b) Dance: Types: Classical, Semi-classical, Contemporary
(c) Theater: Drama, One-act-play, Mono-act, Skit, Mime, Mimicry,
(d) Literary: Poetry, Elocution, Quiz, Debate
(e) Art and Craft and Fine Art: Drawing, Painting, Rangoli, Cartooning, Knitting, Weaving, Embroidery, Quilling, Paper Folding, Clay Modeling Tattoo Making Photography, Videography, Digital Art (Related to Computers, Media)
(f) Other Activities: Gardening, Cooking, etc.

Unit III: Post Activity (4 Hrs.)

Report preparation/ performance video/ Participation/ Group Activities/ Professional Certification.

Term work: Guidelines for students

Student **must join anyone** of the clubs mentioned in the syllabus and perform activities on given theme in group or as an Individual.
Activities assigned by the club teacher should be completed by the student under term work for continuous assessment.

Guidelines for Laboratory -Term Work Assessment:

1. The distribution of weightage of Term Work marks should be informed to students before start of the semester.

2. Student progress should be observed on a continuous basis. At frequent intervals students are expected to inform about their progress/lagging. At the end Competitions/exam will be conducted as a part of Term Work assessment.