



**B.Tech - INFORMATION TECHNOLOGY
Course Structure R-22**

SEMESTER I

S.No.	Course Classification	Course Code	Name of the subject	L	T	P	C	I	E	Total
1	BS	D1BSM1	Linear Algebra and Ordinary Differential Equations	3	1	0	4	40	60	100
2	BS	D1BSAP1	Applied Physics	3	1	0	4	40	60	100
3	ES	D1ESCP4	Problem Solving using C Programming	3	0	0	3	40	60	100
4	ES	D1ESBEE	Basic Electrical Engineering	3	0	0	3	40	60	100
5	ES	D1ESCEG	Computer Aided Engineering Graphics	1	0	4	3	40	60	100
6	BS	D1BSAP2	Applied Physics Lab	0	0	2	1	40	60	100
7	ES	D1ESCP5	Problem Solving using C Programming Lab	0	0	2	1	40	60	100
8	ES	D1ESBES	Basic Electrical and Simulation Lab	0	0	2	1	40	60	100
TOTAL				13	2	10	20	320	480	800

SEMESTER II

S.No.	Course Classification	Course Code	Name of the subject	L	T	P	C	I	E	Total
1	BS	D2BSM5	Statistical Methods and Vector Calculus	3	1	0	4	40	60	100
2	BS	D2BSEC1	Engineering Chemistry	3	1	0	4	40	60	100
3	HS	D2HSE1	English for Skill Enhancement	2	0	0	2	40	60	100
4	ES	D2ESPP6	Problem Solving using Python	3	0	0	3	40	60	100
5	ES	D2ESED1	Electronic Devices and Circuits	2	0	0	2	40	60	100
6	BS	D2BSEC2	Engineering Chemistry Lab	0	0	2	1	40	60	100
7	HS	D2HSE2	English Language and Communication Skills Lab	0	0	2	1	40	60	100
8	ES	D2ESPP7	Python Programming Lab	0	0	2	1	40	60	100
9	ES	D2ESED2	Electronics Devices and Circuits Lab	0	0	2	1	40	60	100
10	ES	D2ESITW	IT Workshop	0	0	2	1	40	60	100
TOTAL				13	2	10	20	400	600	1000

L-Lecture hours per week; T-Tutorial hours per week; P-Practical hours per week; I-Internal Marks; E-External Marks; S-Satisfactory



INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

**L/T/P/C
3/1/0/4**

LINEAR ALGEBRA AND ORDINARY DIFFERENTIAL EQUATIONS (D1BSM1)

Pre-requisites: Mathematical Knowledge at pre-university level

COURSE OBJECTIVES

To learn:

- Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations
- Concept of Eigen values and Eigen vectors and to reduce the quadratic form to canonical form.
- Methods of solving the differential equations of first order.
- Find general solution to linear, homogeneous and non-homogeneous ODEs with constant coefficients.
- Evaluation of double integrals.

COURSE OUTCOMES

After learning the contents of this paper the student must be able to

CO1: Discuss the matrix representation of a set of linear equations and to analyse the solution of the system of equations.

CO2: Reduce the quadratic form to canonical form using orthogonal transformation.

CO3: Identify whether the given DE of first order is exact or not.

CO4: Can find applications of first order ODE.

CO5: Solve higher differential equation and apply the concept of differential equation to real world problems.

CO6: Evaluating double integrals and applying them to compute the areas of regions.

UNIT I

Matrices & System of Equations

Types of matrices - rank of a matrix by Echelon form and normal form- inverse of nonsingular matrices by Gauss-Jordan method - System of linear equations- solving system of homogeneous and non homogeneous equations- Gauss elimination method.

UNIT II

Eigen Values and Eigen Vectors

Eigen values and Eigen vectors and their properties - Cayley-Hamilton theorem (without proof) finding inverse and powers of a matrix by Cayley-Hamilton theorem- diagonalization of a Matrix - linear transformation and orthogonal transformation - quadratic forms and nature of the quadratic forms- reduction of quadratic form to Canonical forms by orthogonal transformation.

UNIT III**Ordinary Differential Equations of First Order, First Degree and its applications**

Exact- linear and Bernoulli's equations- orthogonal trajectories - applications - Newton's law of cooling-law of natural growth and decay.

UNIT IV**Second Order Ordinary Linear Differential Equations:**

Second order linear differential equations with constant coefficients- Non-Homogeneous terms of the type e^{ax} - $\sin ax$ - $\cos ax$ - polynomials in x - $e^{ax}V(x)$ and $xV(x)$ - method of variation of parameters.

UNIT V**Double Integrals and Applications:**

Evaluation of double Integrals (cartesian and polar coordinates) - change of order of integration(only cartesian form)- change of variables (cartesian to polar) for double integrals- applications of double integrals to evaluate surface areas of curves (only in Cartesian Coordinates).

TEXT BOOKS

1. B.S.Grewal- Higher Engineering Mathematics- Khanna Publishers- 40th Edition- 2015.
2. Ramana B.v.- Higher Engineering Mathematics- Tata McGraw Hill New Delhi- 11th Reprint- 2010.
3. Engineering Mathematics by TKV Iyengar, B. Krishna Gandhi, S. Chand and publications

REFERENCE BOOKS

1. N.P. Bali and Manish Goyal- A text book of engineering Mathematics-Laxmi Publications-Reprint-2008.
2. Erwin Kreyszig –Advanced Engineering Mathematics- 10thEdition- Wiley - 2021
3. Advanced Engineering Mathematics by S.R.K. Iyengar R.K. Jain – NarosaPublications.



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INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

L/T/P/C

3/1/0/4

APPLIED PHYSICS (D1BSAP1)

COURSE OBJECTIVES

Students will be able to

1. Demonstrate competency and understanding the concepts of quantum mechanics.
2. Understand the knowledge on fundamentals of band theory of solids, and enables classify the materials on the basis of energy gap.
3. Explore the concepts of semiconductor physics for different engineering applications
4. Gain the knowledge on the optoelectronic and display devices for various engineering applications
5. Study the characteristics of optical fibers and their applications and quantum information science

COURSE OUTCOMES

After completion of student would able to

1. Summarize the fundamentals of quantum mechanics to understand the quantum physics in the physical world,
2. By understand the fundamentals of band theory of solids; students will be able to classify the materials on the basis of energy gap.
3. Knowing the physics behind the semiconductors, enables the students to use them in different engineering applications
4. Establishing a strong foundation on the different kinds of opto-electronic, dielectric and display materials and paves a way for them to use in at various technical and engineering applications
5. Knowledge on fiber optics and quantum information enables the students to apply them in systems like optical communications and advanced quantum communication.

UNIT I

QUANTUM PHYSICS

Wave particle duality, de-Broglie's matter waves, characteristics of matter waves, Davisson and Germer's experiment, Heisenberg's uncertainty principle, Schrödinger time-independent wave equation, Physical significance and characteristics of wave function, Particle in a one-dimensional box and extension to 3D.

UNIT II

BAND THEORY OF SOLIDS

Free electron theory (Classical & Quantum): Fermi level, Density of states. Periodic potential, Bloch theorem, Kronig-Penny model, E-k diagram, Concept of effective mass,

Origin of energy bands in solids, Classification of materials into conductors semiconductors and Insulators.

UNIT III

SEMICONDUCTOR PHYSICS

Intrinsic and Extrinsic semiconductors, Carrier concentration in Intrinsic semiconductor , carrier concentration in Extrinsic semiconductor: donor concentration in n-type and acceptor concentration in p-type semiconductors, Variation of Fermi level with temperature and doping concentration, Carrier transport diffusion and drift, Formation of PN junction, V-I characteristics of PN diode, Hall effect and its applications.

UNIT IV

OPTOELECTRONIC, DIELECTRIC AND DISPLAY DEVICES

Optoelectronics devices: Direct and Indirect band gap semiconductors, Construction and working of LED, Laser diode, Photodiode, PIN diode, Avalanche photo diode (APD) and solar cells.

Dielectric and Display Materials: Basic definitions, Types of polarizations (qualitative) - Ferroelectric, Piezoelectric and Pyroelectric materials, Applications, Luminescence, Photoluminescence, Cathodoluminescence, Electroluminescence, Injection electroluminescence. Displays: working principles of plasma, LCD and numerical displays

UNIT V

FIBER OPTICS AND QUANTUM INFORMATION SCIENCE

Fiber Optics: Introduction to optical fiber, Construction and working principle of an Optical Fiber, Acceptance angle and numerical aperture, Types of Optical fibers, step and graded index fibers, Attenuation in optical fiber, Applications of optical fiber : Optical fiber communication system.

Quantum information science: Introduction, Quantum mechanical bit, Superposition and entanglement, Representation of quantum mechanical state using Dirac notation, Hilbert space, Quantum state vector, Bloch sphere representation of Qubit, Quantum logic gates: Single Qubit gates, Multiple Qubit gates, Applications.

TEXT BOOKS

1. P.K PalaniSwami, Engineering Physics-II, 2ndedition Scitech publication-2012
2. P.K.Palaniswamy Engineering Physics, 4th edition Scitech publication-2014
3. Avadhanulu M N., Kshirsagar P G, A text book of Engineering Physics, S Chand publications Pvt. Ltd, 2014.
4. D.K. Bhattacharya and PoonamTandon, Engineering Physics, Oxford Higher Education press,2015
5. Bhavana P. Butey, Applied Physics for Engineering, Oxford University Press

REFERENCE BOOKS

1. Gaur R K., Gupta S L, Engineering Physics, DhanpatRai Publications, 2012.
2. AjoyGhatak, Basic Quantum Mechanics, 5th Edition, Trinity/Laxmi Publications Ltd., 2014.
3. Mehta V K., Mehta Rohit, Principles of Electronics, S. Chand Publications Pvt. Ltd, 2014.
4. David Halliday, Robert Resnick, Jearl Walker, Fundamentals of Physics, 10th Edition, Wiley Publishers, 2013.
5. Jack D Hidary, Quantum Computing: An Applied Approach, Springer, 2019.
6. Seiki Akama, Elements of Quantum Computing: History, Theories and Engineering Applications, Springer; 2015.



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INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

**L/T/P/C
3/0/03**

PROBLEM SOLVING USING C PROGRAMMING (D1ESCP4)

COURSE OBJECTIVES

To impart knowledge on

- Write solutions using problem solving techniques and appropriate programming constructs
- Develop programs using selection, iteration statements and arrays
- Construct programs using functions and strings
- Implement programs using pointers, structures and unions
- Write programs using files and preprocessor directives

COURSE OUTCOMES

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

CO1: Write solutions using problem solving techniques and appropriate programming constructs for solving problems

CO2: Develop programs using selection, iteration statements and arrays for a given scenario

CO3: Construct programs using functions & strings for a given application

CO4: Implement programs using pointers, structures & unions for various real time applications

CO5: Write programs using files & preprocessor directives and graphics functions for a given scenario

Unit I

C Programming Basics

General Problem solving strategy - Program development cycle - Problem Solving Techniques: Algorithm, Pseudo code and Flow Chart - Overview of C - Structure of C program - C Character set - keywords - Identifiers -Variables and Constants - Data types - Type conversion - Operators and Expressions - Managing formatted and unformatted Input & Output operation.

Unit II

Control Structures and Arrays

Storage classes - Statements: Selection statements - Jump statements - Iteration statements. Arrays: Characteristics of Array - Single-dimensional array - Two-dimensional array - Array Operations - Applications: Linear search, Selection sort, Matrix Operations.

Unit III**Functions and Strings**

Functions: Declaration & Definition - Return statement - Classification of functions - Parameter passing methods: call by value - call by reference - Passing Array to a Function - Returning Array from a function - Recursion. Strings: Declaration and Initialization of string - Display of strings with different formats - String library Functions - String conversion functions.

Unit IV**Pointers, Structures and Union**

Pointers: Features and Types of pointers - Operations on pointers - Pointers to an Array. Structures: Declaration & Initialization of Structures - Structure within Structure - Array of Structures - Pointer to Structures - Structure and Functions - typedef. Union: Declaration & Initialization of Union - Operations on Union - Enumerations.

Unit V**Files and Preprocessor Directives**

Introduction to Files - Streams and File Types - File operations (Open, close, read, write) - Command line arguments - Preprocessor Directives: Macro Expansion, File Inclusion, Conditional Compilation - Graphics functions.

TEXT BOOK

1. Ajay Mittal, "Programming in C: A Practical Approach", 3rd Edition, Pearson Education, 2010.
2. A.N.Kamthane,"Programming in C" 3rd Edition" Pearson Education, 2015.
- 3.

REFERENCE BOOK

1. Venit S, and Darke E, "Prelude to Programming Concepts and Design", 6th Edition, Pearson Education, 2015.
2. Ashok N. Kamthane," Programming in C", 3rd Edition, Pearson Education, 2015.
3. Yashavant P.Kanetkar, "Let Us C" 16th Edition, BPB Publications, 2018.
4. Pradip Dey, Manas Ghosh, " Computer Fundamentals and programming in C", 2nd Edition, Oxford University Press, 2013

Web References:

1. <http://www.cprogramming.com/>
2. <https://www.learn-c.org/>
3. <https://www.programiz.com/c-programming>
4. <https://www.w3schools.com/c/>
5. <https://www.javatpoint.com/c-programming-language-tutorial>



INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

**L/T/P/C
3/0/0/3**

BASIC ELECTRICAL ENGINEERING (DIESBEE)

Prerequisites: Linear Algebra and Calculus

COURSE OBJECTIVES

Objectives of this course are

1. To introduce the concept of DC and AC electrical circuits and its applications.
2. To determine the performance of single phase transformer.
3. To study the concepts of different types of Electrical Machines.
4. To acquire knowledge about various configurations for electrical installations and its applications.

COURSE OUTCOMES

After this course, the student will be able to

1. Understand and analyze DC, AC circuits using basic principles.
2. Analyze and evaluate electrical circuits using various theorems.
3. Understand the characteristics and performance of Electrical Machines and Transformers.
4. Understand the applications of various electrical installations.

UNIT I

DC Circuits

Electrical circuit elements (R, L and C), Dependent and Independent of voltage and current sources, Kirchhoff current and voltage laws, Analysis of Resistive circuits-Mesh, Nodal Analysis and Star-Delta Transformations, Superposition, Reciprocity, Thevenin, Norton, Maximum Power Transfer Theorems, Numerical problems.

UNIT II

AC Circuits

AC Fundamentals: Sinusoidal voltage and currents, mathematical and graphical representation, concept of cycle period, frequency, instantaneous, peak, average, RMS values, peak factor, form factor, phase difference, lagging, leading and in phase quantities and phasor representation. Rectangular and polar representation of phasors. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC and RLC combinations (series and parallel). Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT III**Transformers**

Magnetic circuits, Construction and working principle of Ideal and Practical Transformer, Equivalent Circuit, Losses in Transformers, Regulation and Efficiency, OC & SC test on 1-phase Transformer. Auto-Transformer. Three-phase transformer connections.

UNIT IV**Electrical Machines**

Construction of DC machines, Armature windings – DC Generator – Principle of operation - EMF Equation– DC Motor – Principle of operation – Back EMF - Torque Equation, Generation of rotating magnetic fields, Construction and working principle of a three-phase and Single-phase induction motor, torque- speed characteristics, Construction and working principle of synchronous generators.

UNIT V**Electrical Installations**

Basic concept of wiring systems, Service Mains, Meter board and Distribution board, Concept of Earthing. Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

TEXT BOOKS

1. D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.
2. S.K.Bhattacharya, “Electrical installations and House Wiring”, Pearson Publications.

REFERENCE BOOKS

1. S.K.Bhattacharya, “Basic Electrical & Electronics Engineering”, Pearson Publications.
2. V. N. Mittal and Arvind Mittal, “Basic Electrical Engineering” McGraw Hill.
3. Edward Hughes, “Electrical Technology,” Pearson Education.
4. Edminister.J., “Electrical Circuits” Schaum’s Outline Series, Tata McGrawHill.
5. Sudhakar and Shyam Mohan, “Circuits and Networks Analysis and Synthesis, Tata McGrawHil



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INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

L/T/P/C

1/0/4/3

COMPUTER AIDED ENGINEERING GRAPHICS (D1ESCEG)

COURSE OBJECTIVES

- To develop the ability of visualization of different objects through technical drawings
- To acquire computer drafting skill for communication of concepts, ideas in the design of engineering products

COURSE OUTCOMES

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

- Apply computer aided drafting tools to create 2D and 3D objects
- sketch conics and different types of solids
- Appreciate the need of Sectional views of solids and Development of surfaces of solids
- Read and interpret engineering drawings
- Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting

UNIT I

Introduction to Engineering Graphics: Principles of Engineering Graphics and their Significance, Scales – Plain & Diagonal, Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid and Hypocycloid, Introduction to Computer aided drafting – views, commands and conics

UNIT II

Orthographic Projections: Principles of Orthographic Projections – Conventions – Projections of Points and Lines, Projections of Plane regular geometric figures. Auxiliary Planes. Computer aided orthographic projections – points, lines and planes

UNIT III

Projections of Regular Solids – Auxiliary Views - Sections or Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views, Computer aided projections of solids – sectional views

UNIT IV

Development of Surfaces of Right Regular Solids – Prism, Cylinder, Pyramid and Cone, Development of surfaces using computer aided drafting

UNIT V

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts. Conversion of Isometric Views to Orthographic Views and Vice-versa – Conventions. Conversion of orthographic projection into isometric view using computer aided drafting.

TEXT BOOKS

1. Engineering Drawing N.D. Bhatt / Charotar
2. Engineering Drawing and graphics Using AutoCAD Third Edition, T. Jeyapoovan, Vikas: S.Chand and company Ltd.

REFERENCE BOOKS

1. Engineering Drawing, Basant Agrawal and C M Agrawal, Third Edition McGraw Hill
2. Engineering Graphics and Design, WILEY, Edition 2020
3. Engineering Drawing, M. B. Shah, B.C. Rane / Pearson.
4. Engineering Drawing, N. S. Parthasarathy and Vela Murali, Oxford
5. Computer Aided Engineering Drawing – K Balaveera Reddy et al – CBS Publishers

Note: - External examination is conducted in conventional mode and internal evaluation to be done by both conventional as well as using computer aided drafting



INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

L/T/P/C

0/0/2/1

APPLIED PHYSICS LAB (D1BSAP2)

COURSE OBJECTIVES

1. Study of wavelength and V-I characteristics of Laser diode.
2. Understand the numerical aperture and bending loss of an optical fiber.
3. Study of variation of current with voltage for optoelectronic devices.
4. Understand the Hall Effect in semiconductor.
5. Acquire the knowledge to find the Plank's constant experimentally.

COURSE OUTCOMES

1. Identify the V-I characteristics of Laser diode.
2. Evaluate the numerical and bending loss of given optical fiber.
3. Analyze the V-I characteristics of LED and photodiode devices.
4. Identify the type of semiconductor by using Hall Effect experiment.
5. Calculate the Plank's constant using Photocell.

LIST OF EXPERIMENTS:

1. Energy Band gap: To determine the energy band gap of a given semiconductor diode.
2. Plank's Constant: To determine the Plank's constant using photoelectric effect.
3. Hall Effect: To evaluate the Hall coefficient of a given semiconductor.
4. LED: To study the V-I characteristics of Light Emitting Diode.
5. Laser diode: To study the V-I characteristics of semiconductor laser diode.
6. Laser Diffraction: To determine the wavelength of given Laser beam.
7. Numerical aperture: To determine the numerical aperture of an optical fiber
8. Losses in optical fibers: To estimate the bending loss in an optical fiber.
9. Photodiode: To study the V-I characteristics and measure the dark current in the photodiode.
10. Solar Cell: To find the fill factor of solar cell using V-I characteristics.

Note: Any eight experiments are to be performed compulsory

REFERENCE BOOKS

1. Ruby Das, Rajesh Kumar, C. S. Robinson, Prashant Kumar Sahu, A Textbook of Engineering Physics Practical, Second Edition, University Science Press, New Delhi, 2016.
2. C.V. Madhusudana Rao, V. Vasanth Kumar, Engineering Physics Lab Manual, Scitech publications(India) Pvt.Ltd.-2014
3. Dr.Y. Aparna & Dr .K.VenkateswaraRao, Laboratory Manual of Engineering Physics, V.G.S Book Links, Vijayawada,2010



INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

L/T/P/C

0/0/2/1

PROBLEM SOLVING USING C PROGRAMMING LAB (D1ESCP5)

COURSE OBJECTIVES

To impart knowledge on

- Write solutions using problem solving techniques and appropriate programming constructs
- Develop programs using selection, iteration statements and arrays
- Construct programs using functions and strings
- Implement programs using pointers, structures and unions
- Write programs using files and preprocessor directives

COURSE OUTCOMES

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

- CO1:** Write solutions using problem solving techniques and appropriate programming constructs for solving problems
- CO2:** Develop programs using selection, iteration statements and arrays for a given scenario
- CO3:** Construct programs using functions & strings for a given application
- CO4:** Implement programs using pointers, structures & unions for various real time applications
- CO5:** Write programs using files & preprocessor directives and graphics functions for a given scenario

List of Exercises

1. Programs to process data types, operators and expression evaluation
2. Programs using decision and looping statements
3. Programs using arrays and strings
4. Programs using functions and pointers
5. Programs using structures and union
6. Programs using files and graphics functions

TEXT BOOKS

1. Ajay Mittal, "Programming in C: A Practical Approach", 3rd Edition, Pearson Education, 2010.
2. A.N.Kamthane,"Programming in C" 3rd Edition" Pearson Education, 2015.

REFERENCE BOOKS

1. Venit S, and Darke E, "Prelude to Programming Concepts and Design", 6th Edition, Pearson Education, 2015.
2. Ashok N. Kamthane," Programming in C", 3rd Edition, Pearson Education, 2015.
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4. Pradip Dey, Manas Ghosh, " Computer Fundamentals and programming in C", 2nd Edition, Oxford University Press, 2013

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1. <http://www.cprogramming.com/>
2. <https://www.learn-c.org/>
3. <https://www.programiz.com/c-programming>
4. <https://www.w3schools.com/c/>
5. <https://www.javatpoint.com/c-programming-language-tutorial>



INFORMATION TECHNOLOGY

B.Tech I YEAR I SEMESTER

L/T/P/C

0/0/2/1

BASIC ELECTRICAL & SIMULATION LAB (D1ESBES)

Prerequisites: Basic Electrical Engineering

COURSE OBJECTIVES

1. Students will gain the basic knowledge of electrical circuits using various laws.
2. Identify and apply different theorems for electrical circuits.
3. Assess the performance of different types of Electrical machines and single phase transformer.
4. Apply basic electrical engineering knowledge for house wiring practice.

COURSE OUTCOMES

After the completion of this laboratory course, the student will be able to

1. Apply various laws to solve electrical networks.
2. Apply network theorems to solve complex electrical networks.
3. Evaluate the performance of different types of Electrical machines and single phasetransformer by conducting various tests
4. Understand and analyze electrical installations using different lamp controlled methods, staircase wiring and different wiring connection

List of Experiments: (Any 10 Experiments)

1. Verification of Ohm's, Kirchhoff's current law and Voltage law using hardware and digitalsimulation.
2. Mesh analysis using hardware and digital simulation.
3. Nodal analysis using hardware and digital simulation
4. Verification of Thevenin and Norton theorems using hardware and digital simulation.
5. Verification of Superposition and Reciprocity theorems hardware and digital simulation.
6. Magnetization characteristics of DC shunt generator.
7. Conduct brake test on dc shunt motor.
8. To perform open circuit and short circuit test on single phase transformer.
9. Make circuit for series and parallel connection of lamps.
10. Make a circuit for stair case wiring.
11. Make a circuit for Godown wiring.
12. Make a electrical bell connection practice boad.



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INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

**L/T/P/C
3/1/04**

STATISTICAL METHODS AND VECTOR CALCULUS (D2BSM5)

Pre-requisites: Mathematical Knowledge at pre-university level

COURSE OBJECTIVES

To learn

1. To introduce the concepts of Statistics.
2. To understand the basic statistical tools for analysis & interpretation of qualitative and quantitative data.
3. To understand the basic concepts of Time Series.
4. The physical quantities involved in engineering field related to vector valued functions.
5. The basic properties of vector valued functions and their applications to line-surface and volume integrals.

COURSE OUTCOMES

After learning the contents of this course the student must be able to

CO1: Apply Statistical logic for solving the problems.

CO2: Analyse the qualitative & quantitative data.

CO3: Analyse the time series for the given data

CO4: Explain and compute derivatives of vector valued functions, gradient functions

CO5: Evaluate the line- surface and volume integrals and converting them from one to another.

UNIT I

Introduction of Statistics

Functions of statistics, Collection of data, Classification of data, Tabulation of data, diagrammatic and Graphical representation of data. Measures of Central Tendency- Mean, Median, Mode, Geometric Mean and Harmonic Mean.

UNIT II

Measures of Dispersion

Range, Quartile deviation, Mean Deviation, Standard deviation and Coefficient of variation, Skewness: Karl Pearson's co-efficient of skewness, Bowley's co-efficient of skewness, Kelleysco-efficient of skewness, Kurtosis.

UNIT III**Time Series Analysis**

Introduction, Components of time series, uses of time series, Measurement of Trend by Graphic method, Method of semi averages, Moving average methods, Measurements of seasonal fluctuations by Method of simple averages, Ratio to Trend Method, Ratio to moving average Methods

UNIT IV**Vector Differentiation**

Vector point functions and scalar point functions- gradient- divergence and curl-directional derivatives-tangent plane and normal line-vector Identities-scalar potential functions-solenoidal and irrotational vectors.

UNIT V**Vector Integration**

Line Integral- surface Integral and volume Integrals- Green's theorem- Gauss Divergence theorem and Stoke's theorem (without proofs)and their applications.

TEXT BOOK

1. Fundamentals of applied Statistics, S.C. Gupta & V.K.Kapoor, Sultan Chand & Sons
2. S.C. Gupta &V.K. Kappor., Fundamentals of Mathematical Statistics, S Chand Publishers.
3. B.S. Grewal- Higher Engineering Mathematics- Khanna Publishers- 40th Edition- 2015.
4. Engineering Mathematics by TKV Iyengar, B. Krishna Gandhi, S. Chand and publications

REFERENCE BOOK

1. Introduction to Statistics by Härdle, Wolfgang Karl, Klinke, Sigbert, Rönz, Bernd, Springer(E- BOOK)
2. Erwin Kreyszig –Advanced Engineering Mathematics- 10thEdition- Wiley - 2021



INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

**L/T/P/C
3/1/0/4**

ENGINEERING CHEMISTRY (D2BSEC1)

COURSE OBJECTIVES

- To bring adaptability to new developments in Chemistry and to acquire the skills required to become a perfect engineer.
- To include the importance of treatment of water in Industries.
- To acquire required knowledge about Batteries and their applications.
- 4 To bring Basic Knowledge of polymers and their applications.

COURSE OUTCOMES

- Students will acquire the basic knowledge of conductance in Metals and Bond Structures.
- The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
- They will acquire the Knowledge of chemistry in Batteries.
- They can learn the fundamentals and general properties of polymers and ther engineering materials.
- They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

Unit I

Molecular Structure and Theories of Bonding

Chemical bonding: Introduction to atomic and molecular orbitals. Linear combination of atomic orbital's (LCAO). Energy level diagram of homonucleus(N₂, O₂ and F₂) and heteronucleus(CO and HF). π -molecular orbitals of butadiene and benzene. Bonding in solids: Band structure of solids. The effect of doping on band structure in solids and electronic properties of materials.

UNIT II

Water and its treatment

Introduction to hardness of water – Estimation of hardness of water by complex metric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water-Disinfection of potable water by chlorination and break-point chlorination Boiler troubles: Sludges, Scales and Caustic embrittlement. Internal treatment of Boiler feed water –Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods -Softening of water by ion-exchange processes. Desalination of water– Reverse osmosis.

UNIT III

Battery Chemistry & Corrosion

Introduction - Classification of batteries- primary, secondary and reserve batteries with examples. Basic requirements for commercial batteries. Construction, working and applications of: Zn-air and Lithium ion battery, Applications of Li-ion battery to electrical vehicles. Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell and Solid oxide fuel cell. Solar cells - Introduction and applications of Solar cells. Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current methods.

UNIT IV

Energy Sources

Introduction, Calorific value of fuel – HCV, LCV- Dulong's formula. Solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Tropsch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG, Biodiesel – Trans esterification, advantages

UNIT V

Polymeric materials

Definition–Classification of polymers with examples–Types of polymerizations– addition (free radical addition) and condensation polymerization with –Nylon 6:6. **Plastics:** Definition and characteristics-thermoplastic and thermosetting plastics, Preparation, Properties and engineering applications of PVC, Bakelite and Teflon. **Rubbers:** Natural rubber and its vulcanization. **Elastomers:** Characteristics–preparation–properties and applications of Buna-S, Butyl rubber. **Conducting polymers:** Characteristics and Classification with examples-mechanism of conducting polymer trans-poly acetylene and applications of conducting polymers.

TEXT BOOKS

1. Engineering Chemistry, Dr.Bharathi Kumari Yalamanchili VGS Techno series Publishing Company, 2018
2. Engineering Chemistry P.C. Jain and M.Jain, Dhanpatrai Publishing Company,2010
3. Engineering Chemistry RamaDevi,Venkata Ramana Reddy and Rath,Cengage learning,2016
4. A textbook of Engineering Chemistry M.Thirumala Chary,E. Laxminarayana andK.Shashikala,PearsonPublications,2021.
5. Textbook of Engineering Chemistry Jaya Shree Ani Reddy ,Wiley Publications.

REFERENCEBOOKS

1. Engineering Chemistry Shikha Agarwal, Cambridge University Press, Delhi(2015)
2. Engineering Chemistry Shashi Chawla,DhanpatraiaandCompany(P)Ltd.Delhi (2011)



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INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

L/T/P/C

2/0/0/2

ENGLISH FOR SKILL ENHANCEMENT (D2HSE1)

COURSE OBJECTIVES

This course will enable the students to:

1. Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
2. Develop study skills and communication skills in various professional situations.
3. Equip students to study engineering subjects more effectively and critically using the theoretical and practical components of the syllabus.

COURSE OUTCOMES

Students will be able to:

1. Understand the importance of vocabulary and sentence structures.
2. Choose appropriate vocabulary and sentence structures for their oral and written communication.
3. Demonstrate their understanding of the rules of functional grammar.
4. Develop comprehension skills from the known and unknown passages.
5. Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
6. Acquire basic proficiency in reading and writing modules of English.

UNIT I

Chapter entitled ‘**Toasted English**’ by **R.K.Narayan** from “**English: Language, Context and Culture**” published by Orient BlackSwan, Hyderabad. **Vocabulary:** The Concept of Word Formation -The Use of Prefixes and Suffixes - Acquaintance with Prefixes and Suffixes from Foreign Languages to form Derivatives - Synonyms and Antonyms. **Grammar:** Identifying Common Errors in Writing with Reference to Articles and Prepositions. **Reading:** Reading and Its Importance- Techniques for Effective Reading. **Writing:** Sentence Structures -Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation- Techniques for writing precisely – Paragraph Writing – Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents.

UNIT II

Chapter entitled ‘**Appro JRD**’ by **Sudha Murthy** from “**English: Language, Context and Culture**” published by Orient BlackSwan, Hyderabad. **Vocabulary:** Words Often Misspelt - Homophones, Homonyms and Homographs **Grammar:** Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement. **Reading:** Sub-Skills of Reading – Skimming and Scanning – Exercises for Practice. **Writing:** Nature

and Style of Writing- Defining /Describing People, Objects, Places and Events – Classifying- Providing Examples or Evidence.

UNIT III

Chapter entitled ‘**Lessons from Online Learning**’ by **F.Haider Alvi, Deborah Hurst et al** from “**English: Language, Context and Culture**” published by Orient BlackSwan, Hyderabad. **Vocabulary:** Words Often Confused - Words from Foreign Languages and their Use in English. **Grammar:** Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses. **Reading:** Sub-Skills of Reading – Intensive Reading and Extensive Reading – Exercises for Practice **Writing:**Format of a Formal Letter-Writing Formal Letters E.g., Letter of Complaint, Letter of Requisition, Email Etiquette, Job Application with CV/Resume.

UNIT IV

Chapter entitled ‘Art and Literature’ by Abdul Kalam from “English: Language, Context and Culture” published by Orient BlackSwan, Hyderabad. **Vocabulary:** Standard Abbreviations in English **Grammar:** Redundancies and Clichés in Oral and Written Communication. **Reading:** Survey, Question, Read, Recite and Review (SQ3R Method) - Exercises for Practice **Writing:** Writing Practices- Essay Writing-Writing Introduction and Conclusion -Précis Writing.

UNIT V

Chapter entitled ‘**Go, Kiss the World**’ by **Subroto Bagchi** from “**English: Language, Context and Culture**” published by Orient BlackSwan, Hyderabad. **Vocabulary:** Technical Vocabulary and their Usage. **Grammar:** Common Errors in English (Covering all the other aspects of grammar which were not covered in the previous units). **Reading:** Reading Comprehension-Exercises for Practice. **Writing:** Technical Reports- Introduction – Characteristics of a Report – Categories of Reports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

Note: Listening and Speaking Skills which are given under Unit-6 in AICTE Model Curriculum are covered in the syllabus of ELCS Lab Course.

- **Note: 1.** As the syllabus of English given in AICTE Model Curriculum-2018 for B.Tech First Year is **Open-ended**, besides following the prescribed textbook, it is required to prepare teaching/learning materials **by the teachers collectively** in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning in the class.
- **Note: 2.** Based on the recommendations of NEP2020, teachers are requested to be flexible to adopt Blended Learning in dealing with the course contents .They are advised to teach 40 percent of each topic from the syllabus in blended mode.

TEXT BOOK

1. “English: Language, Context and Culture” by Orient Black Swan Pvt. Ltd, Hyderabad. 2022. Print.

REFERENCE BOOKS

1. Effective Academic Writing by Liss and Davis (OUP)
2. Richards, Jack C. (2022) Interchange Series. Introduction, 1,2,3. Cambridge University Press
3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
4. Chaudhuri, Santanu Sinha. (2018). Learn English: A Fun Book of Functional Language, Grammar and Vocabulary. (2nd ed.). Sage Publications India Pvt. Ltd.
5. (2019). Technical Communication. Wiley India Pvt. Ltd.
6. Vishwamohan, Aysha. (2013). English for Technical Communication for Engineering Students. Mc Graw-Hill Education India Pvt. Ltd.
7. Swan, Michael. (2016). Practical English Usage. Oxford University Press. Fourth Edition.



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INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

L/T/P/C

3/0/0/3

PROBLEM SOLVING USING PYTHON (D2ESPP6)

COURSE OBJECTIVES

To impart knowledge on

- To know the basics of algorithmic problem solving.
- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures — lists, tuples, dictionaries.

COURSE OUTCOMES

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

CO1: Develop algorithmic solutions to simple computational problems Read, write, execute by hand simple Python programs.

CO2: Structure simple Python programs for solving problems.

CO3: Decompose a Python program into functions.

CO4: Represent compound data using Python lists, tuples, and dictionaries.

CO5: Read and write data from/to files in Python Programs.

Unit I

Algorithmic Problem Solving

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion), the efficiency of algorithms

Unit II

Data, Expressions, Statements

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points. Modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

Unit III**Control Flow, Functions**

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

Unit IV**Lists, Tuples, Dictionaries**

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension; Illustrative programs: selection sort, insertion sort, mergesort, histogram.

Unit V**Files, Modules, Packages**

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

TEXT BOOKS

1. Mohd. Abdul Hameed, “Python for Data Science”, 1st edition, Wiley 2021
2. Allen B. Downey, “Think Python: How to Think Like a Computer Scientist“, 2nd edition, Updated for Python 3, Shroff/O’Reilly Publishers, 2016
3. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

REFERENCE BOOKS

1. John V Guttag, —Introduction to Computation and Programming Using Python“, Revised and expanded Edition, MIT Press , 2013
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
3. Timothy A. Budd, —Exploring Python, Mc-Graw Hill Education (India) Private Ltd.,, 2015.
4. Kenneth A. Lambert, —Fundamentals of Python: First Programs, CENGAGE Learning, 2012.

Web References:

1. <https://www.programiz.com/python-programming>
2. <https://www.w3schools.com/python/>
3. <https://www.python.org/about/gettingstarted/>
4. <https://www.javatpoint.com/python-tutorial>
5. <https://www.pythontutorial.net/>
6. <https://www.learnpython.org/>



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INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

**L/T/P/C
2/0/02**

ELECTRONIC DEVCES & CIRCUITS (D2ESED2)

Pre-requisite: Fundamentals of Semiconductors.

COURSE OBJECTIVES

1. To introduce the concepts of various semiconductor devices like Diodes, Transistors, FET's and MOSFET'S.
2. To impart the knowledge of various configurations, characteristics and applications of electronic circuits.

COURSE OUTCOMES

After this course, the student will be able to

CO1: Acquire the knowledge in semiconductor materials and knows the complete internal structure of PN junction its capacitances, resistances.

CO2: Design the circuits for the conversion of AC to DC Voltages.

CO3: Acquire knowledge in the structure of Transistor (different types, operation, characteristics and applications)

CO4: Analyze the dc bias circuitry of BJT.

CO5: Acquire knowledge in the structure of, FET, MOS (different types, operation, characteristics and applications)

UNIT I

Introduction to semiconductor physics: Formation of P-type and N-type semiconductors, principle and operation of Diode, Volt-Ampere characteristics, Current components in a p-n Diode, Diode equation, Temperature dependence, Static and dynamic resistances, Equivalent circuit, Load line analysis, Diffusion and Transition Capacitances, Break down mechanisms in Diode, Zener Diode and its Applications.

UNIT II

Rectifiers and Filters: P-N junction diode as a Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters – Inductor Filters, Capacitor Filters, L- section Filters, π - section Filters(Qualitative treatment).

UNIT III

Bipolar Junction Transistor (BJT): Principle of Operation, Transistor current components, Transistor as an Amplifier, Common Emitter, Common Base and Common Collector configurations and their Characteristics.

UNIT IV

Transistor Biasing and Stabilization - Operating point, DC Load line, Biasing - Fixed Bias, Collector to Base Bias , Collective and Emitter Feedback Bias, Self bias, Bias stability, Stabilization against variations in V_{BE} , I_{CO} , β , Bias Compensation using Diodes and Transistors.

UNIT V

Field Effect Transistor (FET): Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET.

Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Different types of MOSFET's, Working operation and V-I Characteristics of different types of MOSFET's.

TEXT BOOKS

1. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
2. Millman's Electronic Devices and Circuits – J. Millman and C. C. Halkias, Satyabratajit, TMH, 2/e, 1998.

REFERENCE BOOKS

1. Electronic Devices and Circuits –S.Salivahanan, NSuresh Kumar & A.Vallavaraj
2. Electronic Devices and Circuits – Sanjeev Gupta & Santosh Gupta, Dhanpat Rai Publications



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INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

L/T/P/C

2/0/0/2

ENGINEERING CHEMISTRY LAB (D2BSEC2)

COURSE OBJECTIVES

The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

- Estimation of hardness of water to check its suitability for drinking purpose.
- Students are able to perform estimations of acids and bases using conductometry, potentiometry and pH metry methods.
- Students will learn to prepare polymers.
- Students will learn skills related to the lubricant properties such as surface tension and viscosity of oils.

COURSE OUTCOMES

The experiments will make the student gain skills on:

- The concepts of error and its analysis and can also develop the skills to tabulate the experimental data and derive valid conclusions.
- Hands on experience in performing the electro-analytical techniques such as conductometry, potentiometry and pH metry.
- The ability to prepare polymers.
- Estimation of Surface tension and viscosity of Lubricant oil.

List of Experiments

Volumetric Analysis: Estimation of Hardness of water by EDTA Complexometry method.

Conductometry: Estimation of the concentration of an acid by Conductometry.

Potentiometry:

1. Estimation of the concentration of an acid by Potentiometry
2. Estimation of the amount of Fe^{+2} by Potentiometry.

pH Metry: Determination of an acid concentration using pHmeter.

Preparations:

- Preparation of Bakelite.

Lubricants:

- Estimation of acid value of given lubricant oil.
- Estimation of Viscosity of lubricant oil using Ostwald's Viscometer.

Virtual lab experiments

- Construction of Fuel cell and it's working.
- Smart materials for Biomedical applications

Additional Experiments:

- Thin layer Chromatography calculation of R_f values
- Determination of Surface tension of given liquid by using Stalagmometer.
- Verification of Lambert's and Beer's law using $KMnO_4$.

REFERENCE BOOKS

1. Lab manual for Engineering chemistry by B.Ramadevi and P.Aparna,S Chand Publications,NewDelhi(2022)
2. Vogel's text book of practical organic chemistry 5th edition
3. Inorganic Quantitative analysis by A.I.Vogel, ELBS Publications.
4. College Practical Chemistry by V.K.Ahluwalia,Narosa PublicationsLtd.NewDelhi(2007).



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INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

L/TP/C

0/0/2/1

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB (D2HSE2)

The **English Language and Communication Skills (ELCS) Lab** focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations both in formal and informal contexts.

COURSE OBJECTIVES

- To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
- To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency of students in spoken English and neutralize the impact of dialects.
- To train students to use language appropriately for public speaking, group discussions and interviews

COURSE OUTCOMES

Students will be able to:

- Understand the nuances of English language through audio- visual experience and group activities
- Neutralise their accent for intelligibility
- Speak with clarity and confidence which in turn enhances their employability skills

Syllabus: English Language and Communication Skills Lab (ELCS) shall have two parts:

- a. Computer Assisted Language Learning (CALL) Lab**
- b. Interactive Communication Skills (ICS) Lab**

Listening Skills:

Objectives

1. To enable students develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening, so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

1. To involve students in speaking activities in various contexts
2. To enable students express themselves fluently and appropriately in social and professional contexts
 - Oral practice
 - Describing objects/situations/people
 - Role play – Individual/Group activities
 - Just A Minute (JAM) Sessions

The following course content is prescribed for the **English Language and Communication Skills Lab**.

Exercise – ICALL Lab

Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers- Effective Listening. Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants – Minimal Pairs- Consonant Clusters- Past Tense Marker and Plural Marker- Testing Exercises

ICS Lab

Understand: Spoken vs. Written language- Formal and Informal English.

Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave –Introducing Oneself and Others.

Exercise – IICALL Lab

Understand: Structure of Syllables – Word Stress– Weak Forms and Strong Forms – Stress pattern insentences – Intonation.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms- Stress pattern insentences – Intonation - Testing Exercises

ICS Lab:

Understand: Features of Good Conversation – Strategies for Effective Communication.

Practice: Situational Dialogues – Role Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise - III CALL Lab

Understand: Errors in Pronunciation-Neutralising Mother Tongue Interference (MTI).

Practice: Common Indian Variants in Pronunciation – Differences between British and American Pronunciation -Testing Exercises

ICS Lab

Understand: Descriptions- Narrations- Giving Directions and Guidelines – Blog Writing
Practice: Giving Instructions – Seeking Clarifications – Asking for and Giving Directions – Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise – IV CALL Lab

Understand: Listening for General Details.
Practice: Listening Comprehension Tests - Testing Exercises

ICS Lab

Understand: Public Speaking – Exposure to Structured Talks - Non-verbal Communication-Presentation Skills.
Practice: Making a Short Speech – Extempore- Making a Presentation.

Exercise – V CALL Lab

Understand: Listening for Specific Details.
Practice: Listening Comprehension Tests -Testing Exercises

ICS Lab

Understand: Group Discussion
Practice: Group Discussion

Minimum Requirement of infrastructural facilities for ELCS Lab

1. Computer Assisted Language Learning (CALL) Lab

The Computer Assisted Language Learning Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.

System Requirement (Hardware component)

Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:

- i) Computers with Suitable Configuration
- ii) High Fidelity Headphones

2. Interactive Communication Skills (ICS) Lab

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio- visual aids with a Public Address System, a T. V. or LCD, a digital stereo –audio & video system and camcorder etc.

Source of Material (Master Copy)

- Exercises in Spoken English. Part 1, 2, 3. CIEFL and Oxford University Press

Note: Teachers are requested to make use of the master copy and get it tailor-made to suit the contents of the syllabus.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD.
- Grammar Made Easy by Darling Kindersley.
- Punctuation Made Easy by Darling Kindersley.
- Oxford Advanced Learner's Compass, 10th Edition.
- English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- English Vocabulary in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).
- Digital All
- Orell Digital Language Lab (Licensed Version)

REFERENCE BOOKS

1. (2022). *English Language Communication Skills – Lab Manual cum Workbook*. Cengage Learning India Pvt. Ltd.
2. Shobha, KN & Rayen, J. Lourdes. (2019). *Communicative English – A workbook*. Cambridge University Press
3. Kumar, Sanjay & Lata, Pushp. (2019). *Communication Skills: A Workbook*. Oxford University Press
4. Board of Editors. (2016). *ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities*. Orient Black Swan Pvt. Ltd.
5. Mishra, Veerendra et al. (2020). *English Language Skills: A Practical Approach*. Cambridge University Press.



INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

**L/T/P/C
0/0/3/1.5**

PYTHON PROGRAMMING LAB (D2ESPP7)

COURSE OBJECTIVES

To impart knowledge on

- To know the basics of algorithmic problem solving.
- To read and write simple Python programs.
- To develop Python programs with conditionals and loops.
- To define Python functions and call them.
- To use Python data structures — lists, tuples, dictionaries.

COURSE OUTCOMES

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

CO1: Develop algorithmic solutions to simple computational problems Read, write, execute by hand simple Python programs.

CO2: Structure simple Python programs for solving problems.

CO3: Decompose a Python program into functions.

CO4: Represent compound data using Python lists, tuples, and dictionaries.

CO5: Read and write data from/to files in Python Programs.

LIST OF PROGRAMS

1. Write a python program to print —Hello Worldl.
2. Write a python program to demonstrate different number data types in python.
3. Write a program to perform different Arithmetic Operations on numbers in Python.
4. Write a program to create, concatenate and print a string and accessing sub-stringfrom a given string.
5. Write a python script to print the current date?
6. Write a program to create, append, and remove lists in python.
7. Write a program to demonstrate working with tuples in python
8. Write a program to demonstrate working with dictionaries in python.
9. Write a python program to find largest of three numbers.
10. Write a Python program to convert temperatures to and from Celsius, Fahrenheit.
11. Write a Python program to construct the following pattern, using a nested for loop

```

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```

12. Write a Python script that prints prime numbers less than 20
13. Write a python program to find factorial of a number using Recursion.
14. Write a program that accepts the lengths of three sides of a triangle as inputs. The program output should indicate whether or not the triangle is a right triangle (Recall from the Pythagorean Theorem that in a right triangle, the square of one side equals the sum of the squares of the other two sides).
15. Write a python program to define a module to find Fibonacci Numbers and import the module to another program.
16. Write a Python class to convert an integer to a roman numeral
17. Write a Python class to implement pow(x, n)
18. Write a Python class to reverse a string word by word.

TEXT BOOKS

1. Mohd. Abdul Hameed, “Python for Data Science”, 1st edition, Wiley 2021
2. Allen B. Downey, “Think Python: How to Think Like a Computer Scientist“, 2nd edition, Updated for Python 3, Shroff/O’Reilly Publishers, 2016
3. Guido van Rossum and Fred L. Drake Jr, —An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

REFERENCE BOOK

1. John V Guttag, —Introduction to Computation and Programming Using Python“, Revised and expanded Edition, MIT Press , 2013
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, —Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
3. Timothy A. Budd, —Exploring Python, Mc-Graw Hill Education (India) Private Ltd., 2015.
4. Kenneth A. Lambert, —Fundamentals of Python: First Programs, CENGAGE Learning, 2012.

Web References:

1. <https://www.programiz.com/python-programming>
2. <https://www.w3schools.com/python/>
3. <https://www.python.org/about/gettingstarted/>
4. <https://www.javatpoint.com/python-tutorial>
5. <https://www.pythontutorial.net/>



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INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

L/T/P/C

0/0/2/1

ELECTRONIC DEVICES & CIRCUITS LAB (D2ESED2)

COURSE OBJECTIVES

- To impart the knowledge of various configurations, characteristics and applications of various electronic devices.
- Acquires the knowledge of various biasing circuits of Transistor.

COURSE OUTCOMES

After the completion of the lab student can be able to:

- CO1: Design different electronic circuits for different applications using devices like Diodes, Transistors, etc.
- CO2: Design circuits which can convert AC to DC.
- CO3: Design various transistor biasing circuits.
- CO4: Design of different Amplifier Circuits.

List of Experiments

PART A: Electronic workshop practice (in 3 lab sessions):

1. Familiarization of R,L,C, Components
2. Study and operation of
 - Multimeters (Analog and Digital)
 - Function Generator
 - Regulated Power Supplies
 - CRO.
3. Familiarization of Devices, Diodes, BJT, and JFET, MOSFET's

PART B

Note: Minimum of 10 expts. are to be done.

1. Forward & Reverse Bias Characteristics of PN Jn. Diode.
2. Zener Diode V-I Characteristics and as a Regulator
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. Input & Output Characteristics of Transistor in CB Configuration.
6. Input & Output Characteristics of Transistor in CE Configuration.
7. FET Characteristics in CS Configuration.
8. Design of Fixed Bias Circuit
9. Design of Collector and Emitter feedback Circuit.
10. Design of Self Bias Circuit.
11. Transistor as an Amplifier



**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)**

(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH,
Accredited by NBA & NAAC with 'A' Grade)



INFORMATION TECHNOLOGY

B.Tech I YEAR II SEMESTER

**L/T/P/C
0/0/2/1**

IT WORKSHOP (D2ESITW)

COURSE OBJECTIVES

1. The IT Workshop is a training lab course to get training on PC Hardware, Internet & World Wide Web, and Productivity tools for documentation, Spreadsheet computations, and Presentation.
2. To introduce to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers, hardware and software level troubleshooting process.
3. To introduce connecting the PC on to the internet from home and workplace and effectively usage of the internet, Usage of web browsers, email, newsgroups and discussion forums. To get knowledge in awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber-attacks.
4. To introduce the usage of Productivity tools in crafting professional word documents, excel spreadsheets and power point presentations using open office tools and LaTeX.

COURSE OUTCOMES

1. Apply knowledge for computer assembling, disassembling and software installation.
2. Ability to solve the trouble shooting problems.
3. Apply the tools for preparation of PPT, Documentation and budget sheet etc.
4. Create standard documents and research documents using Latex.
5. Able to create project plans.

PC Hardware

The students should work on working PC to disassemble and assemble to working condition and install operating system like Linux or any other on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

Problem 1

Every student should identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition.

Problem 2

Every student should individually install operating system like Linux or MS windows on the personal computer. The system should be configured as dual boot with both windows and Linux.

Problem 3

Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition.

Problem 4

Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

Internet & World Wide Web Problem 5

Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate how to access the websites and email.

Problem 6

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Problem 7

Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. Usage of search engines like Google, Yahoo, ask.com and others should be demonstrated by student.

Problem 8

Cyber Hygiene: Students should learn about viruses on the internet and install antivirus software. Student should learn to customize the browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Problem 9

Develop home page: Student should learn to develop his/her home page using HTML consisting of his/her photo, name, address and education details as a table and his/her skill set as a list.

Productivity Tools LaTeX and Word Word Orientation

An overview of LaTeX and Microsoft (MS) office / equivalent (FOSS) tool word should be learned: Importance of LaTeX and MS office / equivalent (FOSS) tool Word as word Processors, Details of the three tasks and features that should be covered in each, using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.

Problem 10**Using LaTeX and Word**

To create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colours, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Problem 11**Creating project abstract Features to be covered**

Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Problem 12**Creating a Newsletter Features to be covered**

Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs in word.

Problem 13**Spreadsheet Orientation**

Accessing, overview of toolbars, saving spreadsheet files, Using help and resources.

Creating a Scheduler

Gridlines, Format Cells, Summation, auto fill, Formatting Text.

Problem 14**Calculating GPA Features to be covered**

Cell Referencing, Formulae in spreadsheet – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, Sorting, Conditional formatting.

Problem 15**Creating Power Point**

Student should work on basic power point utilities and tools in Latex and Ms Office/equivalent (FOSS) which help them create basic power point presentation. PPT Orientation, Slide Layouts, Inserting Text, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting Images, Tables and Charts.

TEXT BOOKS

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
3. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech.
4. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
5. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft).