TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
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B.TECH – ELECTRICAL& ELECTRONICS ENGINEERING
Course Structure R-22

SEMESTER I

S.No	Class	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	ES	D1ESCP1	C Programming for Problem Solving	3	0	0	3	40	60	100
3	BS	D1BSEP1	Engineering Physics	3	1	0	4	40	60	100
4	ES	D1ESEC1	Electrical Circuits	2	0	0	2	40	60	100
5	BS	D1BSEP2	Engineering Physics Lab	0	0	3	1.5	40	60	100
6	ES	D1ESCP2	Basic C Programming for Problem Solving Lab	0	0	3	1.5	40	60	100
7	ES	D1ESCEG	Computer Aided Engineering Graphics	1	0	4	3	40	60	100
8	ES	D1ESEC2	Electrical Circuits Lab	0	0	2	1	40	60	100
		Total Credits		**12**	**2**	**12**	**20**	**320**	**480**	**800**

SEMESTER II

S.No	Class	Course Code	Name of the Subject	L	T	P	C	I	E	Total
1	BS	D2BSM3	Mathematical Transforms	3	1	0	4	40	60	100
2	BS	D2BSAC1	Applied Chemistry	3	1	0	4	40	60	100
3	ES	D2ESNA1	Network Analysis	3	0	0	3	40	60	100
4	HS	D2HSE1	English for Skill Enhancement	2	0	0	2	40	60	100
5	ES	D2ESBW1	Basic Workshop	0	0	3	1.5	40	60	100
6	BS	D2BSAC2	Applied Chemistry Lab	0	0	3	1.5	40	60	100
7	HS	D2HSE2	English Language and Communication Skills Lab	0	0	2	1	40	60	100
8	ES	D2ESNA2	Network Analysis Lab	0	0	2	1	40	60	100
9	ES	D2ESPP1	Python Lab	0	1	2	2	40	60	100
10	MC	MC001	Environmental Science*	3	0	0	0	0	-	S
		Total Credits		**14**	**3**	**12**	**20**	**360**	**540**	**900**
Mandatory Course: Environmental Science										

L - Lecture Hours / Week; T - Tutorial Hours / Week; P - Practical Hours / Week;
I - Internal Marks; E - External Marks; S – Satisfactory

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ELECTRICAL& ELECTRONICS ENGINEERING

B.Tech I Year I Semester   **L/T/P/C**
                                                                                        3/1/0/4

LINEAR ALGEBRA AND ORDINARY DIFFRENTIAL 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 analyses 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 toCanonical forms by orthogonal transformation.

UNIT III
Ordinary Differential Equations of First Order, First Degree and its applications
Applications:
Exact - linear and Bernoulli's equations- orthogonal trajectories - applications - Newton'slaw 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
2. Publications-Reprint-2008.
3. Erwin Kreyszig –Advanced Engineering Mathematics- 10thEdition- Wiley - 2021
4. Advanced Engineering Mathematics by S.R.K. Iyengar R.K. Jain – Narosa Publications.

ELECTRICAL& ELECTRONICS ENGINEERING

B.Tech I Year I Semester   **L/T/P/C**
                                                                                              3/0/0/3

C PROGRAMMING FOR PROBLEM SOLVING (D1ESCP1)

Course Objective:
Learn the fundamentals of computers and C Programming concepts.

Course Outcomes:
After learning the contents of this course, the student must be able to

1. Learn the taxonomy of computers and C fundamentals   (L2)

2. Demonstrate arrays and functions to write c programming (L3)

3. Write C programs using pointers and strings (L3)

4. Analyze and write C programs using structures and unions (L4)

5. Develop C programs for various applications using file I/O functions. (L5)

UNIT I
Introduction to Computers Data Representation
Number Systems, Computer Languages, Algorithms. Introduction to C Language: Data types, Operators,Expressions, Library Functions, Statements-Selection Statements – if and Switch Statements, Repetition
(Loop) statements.

UNIT II
Arrays
One and Two dimensional arrays, Multidimensional arrays, Inter-function communication arraysapplications- linear search, binary search, bubble sort, Implementation of stacks and queues.
Functions: Scope and Extent, storage classes, recursive functions.

UNIT III
Pointers
Introduction, Pointers for inter function communication, arrays of pointers, pointer arithmetic and arrays,passing an array to a function, memory allocation functions, pointers to functions, pointers to pointers.
Strings: Concepts, String Input/ Output functions, arrays of strings, string manipulation functions.

UNIT IV
User Defined Data types Structure and Unions
Initialization, accessing structures, operations on structures. Complex structures-Nested structures, structures containing arrays, structures containing pointers, arrays of structures, structures and functions, Passing structures through pointers, self-referential structures, unions, bit fields, C programming examples, command–line arguments, pre-processor commands.

UNIT V
Input and Output
Concept of a file, streams, text files and binary files, file input/output functions (standard libraryinput/output functions for files), error handling, positioning functions (fseek, rewind and ftell).

Text Books:

1. Computer Science: A Structured Programming Approach Using C, B. A. Forouzan and R. F.Gilberg,Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh, Second Edition, Oxford University Press.

Reference Books:

1. The C Programming Language, B.W. Kernighan and Dennis M. Ritchie, Second Edition, Pearsoneducation.
2. Programming with C, B. Gottfried, 3rd edition, Schaum's outlines, McGraw HillEducation (India) Pvt Ltd.
3. C From Theory to Practice, G S. Tselikis and N D. Tselikas, CRC Press.
4. Basic computation and Programming with C, Subrata Saha and S. Mukherjee, Cambridge UniversityPress.

ELECTRICAL& ELECTRONICS ENGINEERING

B.Tech I Year I Semester   **L/T/P/C**
                                                                                                                    3/1/-/4

ENGINEERING PHYSICS (D1BSEP1)

COURSE OBJECTIVES:
 Students will be able to
1. Understand the basic principles of quantum physics and band theory of solids.
2. Understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
3. Gain the fundamental concepts related to the dielectric and energy materials.
4. Understand the fundamental concepts of magnetic and superconducting materials
5. Understand the characteristics of lasers and optical fibers.

COURSE OUTCOMES:
At the end of the course the student will be able to:
1. Analyze the concepts of quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
2. Identify the role of semiconductor devices in science and engineering applications.
3. Explore the fundamental properties of dielectric and energy materials for their applications.
4. Knowing the concepts related to magnetic and superconducting materials for different engineering applications.
5. Explore the various aspects of lasers and optical fiber and their applications in diverse fields.

UNIT I
QUANTUM MECHANICS AND BAND THEORY OF SOLIDS
Quantum Mechanics: Wave particle duality, de Broglie's matter waves, Davisson and Germer's experiment, Heisenberg uncertainty principle, Born interpretation of the wave function, Time independent Schrodinger's wave equation, Particle in one dimensional potential box.
Band theory of solids: Electron in periodic potential- Bloch's theorem, Kronig-Penney model, E-K diagram, Effective mass of an electron, Origin of energy bands, Classification of solids.

UNIT II
SEMICONDUCTORS AND SEMICONDUCTOR DEVICES
Semiconductors: Intrinsic and extrinsic semiconductors, carrier concentration in intrinsic and extrinsic semiconductors, Hall Effect.
Semiconductor devices : Construction, Principle of operation and characteristics of P-N Junction diode, Direct and Indirect band gap semiconductors, structure and working principle and characteristics of LED, Photo diode and solar cells.

UNIT III
DIELECTRIC AND ENERGY MATERIALS
Dielectric Materials: Basic definitions, Types of polarizations (qualitative), Ferroelectric, Piezoelectric, and Pyroelectric materials, Applications.
Energy Materials: Conductivity of liquid and solid electrolytes, Superionic conductors, materials and electrolytes for super capacitors, Rechargeable ion batteries, Solid fuel cells.

UNIT IV
MAGNETIC MATERIALS AND SUPERCONDUCTIVITY
Magnetic materials: Basic Definitions, Origin of magnetic moment in solids, Classification of magnetic materials. Domain theory of ferromagnetism, Hysteresis-soft and hard magnetic materials.
Superconductivity: Introduction, Effect of Temperature, Magnetic field and current on superconductors, Types of superconductors: Type-I, Type-II superconductors, Magnetic levitation, Applications of superconductors.

UNIT V
LASER AND FIBER OPTICS
Lasers: Laser beam characteristics, Three quantum processes, Einstein coefficients and their relations, Lasing action, Pumping methods, Ruby laser, He-Ne laser, Semiconductor laser, Applications .
Fiber Optics: Introduction to optical fibers, Advantages of optical fibers, Total internal reflection, Construction of optical fibers, Classification of optical fibers, Acceptance angle - Numerical aperture, Losses in optical fiber, Optical fiber for communication system, Applications.

TEXT BOOKS:
1. P.K PalaniSwami, Engineering Physics-II, 2nd edition Scitech publication-2012
2. P.K.Palaniswamy Engineering Physics, 4th edition Scitech publication-2014
3. M. N. Avadhanulu, P.G. Kshirsagar& TVS Arun Murthy" A Text book of Engineering Physics"-S. Chand Publications, 11th Edition 2019.
4. Engineering Physics by Shatendra Sharma and Jyotsna Sharma, Pearson Publication,2019
5. Semiconductor Physics and Devices- Basic Principle – Donald A, Neamen, McGraw Hill, 4th Edition,2021.
6. B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2nd Edition, 2022.

REFERENCE BOOKS:
1. Quantum Physics, H.C. Verma, TBS Publication, 2nd Edition 2012.
2. Fundamentals of Physics – Halliday, Resnick and Walker, John Wiley &Sons,11th Edition, 2018.
3. Introduction to Solid State Physics, Charles Kittel, Wiley Eastern, 2019.
4. Elementary Solid State Physics, S.L. Gupta and V. Kumar, PragathiPrakashan, 2019.
5. A.K. Bhandhopadhya - Nano Materials, New Age International, 1stEdition, 2007.
6. Energy Materials a Short Introduction to Functional Materials for Energy Conversion and Storage Aliaksan Dr S. Bandarenka, CRC Press Taylor & Francis Group
7. Energy Materials, Taylor & Francis Group, 1st Edition, 2022

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ELECTRICAL & ELECTRONICS ENGINEERING

B.Tech. I Year I Semester   **L/T/P/C**
                                                                                              2/0/0/2

ELECTRICAL CIRCUITS

Prerequisites: Mathematics
Course Objectives:
- To gain knowledge in circuits and to understand the fundamentals of derived circuit laws.
- To learn steady state and transient analysis of single phase and 3-phase circuits.
- To understand Theorems and concepts of coupled circuits.

Course Outcomes:
After learning the contents of this paper the student must be able to
- Understand network analysis, techniques using mesh and node analysis.
- Evaluate steady state and transient behavior of circuits for DC and AC excitations.
- Analyze electric circuits using network theorems and concepts of coupled circuits.

UNIT I
Network Elements & Laws: Active & Passive elements, Independent and dependent sources. Passive elements
— R, L and C, Energy stored in inductance and capacitance, Kirchhoff's laws, Source transformations, Star-delta transformations, Node voltage method, Mesh current method including super node and supermesh analysis.

UNIT II
Single-Phase Circuits: RMS and average values of periodic sinusoidal and non-sinusoidal waveforms, Phasor representation, Steady-state response of series, parallel and series-parallel circuits. Impedance, Admittance, Current locus diagrams of RL and RC series circuits with variation of various parameters. Resonance: Series and parallel circuits, Bandwidth and Q-factor

UNIT III
Network theorems: Superposition theorem, Thevinin's theorem, Norton's theorem, Maximum power transfer theorem, Tellegen's theorem, Compensation theorem, Milliman's theorem and Reciprocity theorem. (AC & DC).

UNIT IV
Poly-phase Circuits: Analysis of balanced and unbalanced 3-phase circuits, Star and delta connections, Measurement of three-phase power for balanced and unbalanced loads.

UNIT V
Coupled circuits: Concept of self and mutual inductance, Dot convention, Coefficient of coupling, Analysis of circuits with mutual inductance.
Topological Description of Networks: Graph, tree, chord, Tie-set, cut-set, incident matrix, circuit matrix andcut-set matrix,

TEXTBOOKS:
1. Van Valkenburg M.E, "Network Analysis", Prentice Hall of India, 3rd Edition, 2000.
2. Ravish R Singh, "Network Analysis and Synthesis", McGrawHill, 2nd Edition, 2019.

REFERENCE BOOKS:
1. B. Subramanyam, "Electric Circuit Analysis", Dreamtech Press & Wiley, 2021.
2. James W.Nilsson, Susan A.Riedel, "Electric Circuits", Pearson, 11th Edition, 2020.
3. A Sudhakar, Shyammohan S Palli, "Circuits and Networks: Analysis and Synthesis", McGrawHill, 5th Edition, 2017.
4. Jagan N.C, Lakshrninarayana C., "Network Analysis", B.S. Publications, 3rd Edition, 2014.
5. William Hayt H, Kimmerly Jack E. and Steven Durbin M, "Engineering Circuit Analysis", McGrawHill, 6th Edition, 2002.
6. Chakravarthy A., "Circuit Theory", Dhanpat Rai & Co., First Edition, 1999.

ELECTRICAL& ELECTRONICS ENGINEERING

B.Tech I Year I Semester

L/T/P/C
-/-/3/1.5

ENGINEERING PHYSICS LAB (D1BSEP2)

COURSE OBJECTIVES:
1. Study of the wavelength and V-I characteristics of laser diode.
2. Understand the numerical aperture and bending loss of an optical fiber.
3. Study the variation of current with voltage of optoelectronic devices.
4. Understand the Hall Effect in semiconductor.
5. Acquire the knowledge to find Plank's constant using photoelectric effect experiment.

COURSE OUTCOMES:
1. Identify the V-I characteristics of Laser diode.
2. Evaluate the numerical aperture and bending loss of a 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. Measure 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. Stewart and Gee's Experiment: To determine the magnetic field on the axis of a current carrying coil
5. LED: To study the V-I characteristics of Light Emitting Diode.
6. Laser diode: To study the V-I characteristics of semiconductor laser diode.
7. Laser Diffraction: To determine the wavelength of given Laser beam.
8. Numerical aperture& Bending losses: To determine the numerical aperture of an optical fiber and 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.
11. LCR Circuit: To determine the series and parallel resonance frequency using LCR experiment

Note: Any nine experiments are to be performed compulsory

REFERENCE BOOKS:

1. Ruby Das, Rajesh Kumar, C. S. Robinson, Prashanth Kumar Sahu, A Textbook of Engineering Physics Practical, Second Edition, University Science Press, New Delhi, 2016.
2. C.V. Madhusudana Rao, V. Vasanth Kumar, Engineerng 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

ELECTRICAL& ELECTRONICS ENGINEERING

B.Tech I Year I Semester   **L/T/P/C**
                                                                       0/0/3/1.5

BASIC C PROGRAMMING FOR PROBLEM SOLVING LAB (D1ESCP2)

Course Objective
       Write programs in C using structured programming approach to solve the problems.

Course - Outcomes
    After learning the contents of this course, the student will be able to
   1. Design and test programs to solve mathematical and scientific problems. (L5)
   2. Write structured programs using control structures and functions. (L3)

Experiments:
1.   a) Write a C program to find the factorial of a
                     positive integer.
        b) Write a C program to find the roots of a
           quadratic equation.
2.   a) Write a C program to determine if the given number is a prime number or not.
        b) A Fibonacci sequence is defined as follows: the first and second terms in the
        sequence are 0 and 1.Subsequent terms are found by adding the preceding two terms
        in the sequence. Write a C program to generate the first n terms of the sequence.
3.   a) Write a C program to construct a pyramid of numbers.
         b) Write   a   C   program   to
        calculate   the   following   Sum:
        Sum=1-x2/2!   +x4/4!-
        x6/6!+x8/8!-x10/10!
4.   a) The Least Common Multiple (LCM) of two positive integers a & b is the smallest
        integer that is evenly divisible by both a and b. Write a C program that reads two
        integers and calls GCD (a, b) function that takes two integer arguments and returns
        their LCM. The lcm (a, b) function should calculate the least common multiple by
        calling the GCD (a,b) function and using the following relation: LCM (a,b) = ab /
        GCD (a,b)
        b) Write a C program that reads two integers n and r to compute the ncr value using
        the following relation: ncr (n,r) = n! / r! (n-r)! . Use a function for computing the
        factorial value of an integer.
5.   a) Write C program that reads two integers x and n and calls a recursive function to
         compute xn.
        b) Write a C program that uses a recursive function to solve the Towers of Hanoi
           problem.
        c) Write a C program that reads two integers and calls a recursive function to compute
           ncr value.

6.   a) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user using Sieve of Eratosthenes algorithm.
b) Write a C program that uses non recursive function to search for a Key value in a given list of integers. Use linear search method.

7.   Write a menu-driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.
b) Write a C program that uses non recursive function to search for a Key value in a given sorted listof integers. Use binary search method.

8.   a) Write a C program that implements the Bubble sort method to sort a given list of integers in ascending order.
b) Write a C program that reads two matrices and uses functions to perform the following:
i) Addition of two matrices
ii) Multiplication of two matrices

9.   a) Write a C program that uses functions to perform the following operations:
i) to insert a sub-string into a given main string from a given position.
ii) to delete n characters from a given position in a given string
b) Write a C program that uses a non-recursive function to determine if the given string is apalindrome or not.

10.   a) Write a C program to replace a substring with another in a given line of text.
b) Write a C program that reads 15 names each of up to 30 characters, stores them in an array, anduses an array of pointers to display them in ascending (ie. alphabetical) order.

11.   a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.
b) Write a C program to convert a positive integer to a roman numeral. Ex. 11 is converted to XI.

12.   a) Write a C program to display the contents of a file to standard output device.
b) Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.

13.   a) Write a C program to count the number of times a character occurs in a text file. The file name andthe character are supplied as command-line arguments.
b) Write a C program to compare two files, printing the first line where they differ.

14.   a) Write a C program to change the nth character (byte) in a text file. Use fseek function.
b) Write a C program to reverse the first n characters in a file. The file name and n are specified on the command line. Use f seek function.

15.   a) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).
b) Define a macro that finds the maximum of two numbers. Write a C program that uses the macro and prints the maximum of two numbers.

16.   a) Write a C Program to calculate the sum of n numbers entered by the user using malloc( ) and free() functions.
b) Write a C Program to calculate the sum of n numbers entered by the user using calloc( ) and free() functions.

Text Books:

1. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publishers.
2. Computer Programming using C in C, V. Rajaraman, PHI.
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. C++: The complete reference, H. Schildt, TMH Publishers.

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B.Tech. I Year I Semester   **L/T/P/C**
                                                                     1/0/4/3

COMPUTER AIDED ENGINEERING GRAPHICS

Course Objectives:
1. To develop the ability of visualization of different objects through technical drawings
2. To acquire computer drafting skill for communication of concepts, ideas in the design ofengineering products

Course Outcomes:
At the end of the course, the student will be able to:
1. Apply computer aided drafting tools to create 2D and 3D objects
2. sketch conics and different types of solids
3. Appreciate the need of Sectional views of solids and Development of surfaces of solids
4. Read and interpret engineering drawings
5. Conversion of orthographic projection into isometric view and vice versa manually and byusing 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, Developmentof 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. Conversionof 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 publishing house Pvt Ltd
2. Engineering Drawing and graphics Using AutoCAD Third Edition,
   T.Jeyapoovan, Vikas and company Ltd.

REFERENCE BOOKS
1. Engineering Drawing, Basant Agrawal and C M Agrawal, Third Edition McGraw Hill
   Pvt Ltd
2. Engineering Graphics and Design, WILEY, Edition 2020
3. Engineering Drawing, M. B. Shah, B.C. Rana, Pearson.
4. Engineering Drawing, N. S. Parthasarathy and Vela Murali, Oxford University press.
5. Computer Aided Engineering Drawing,Edited by K Balaveera Reddy at al- CBS
   Publishers

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

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ELECTRICAL& ELECTRONICS ENGINEERING

B.Tech I Year I Semester   **L/T/P/C**
                                                                        0/0/2/1

ELECTRICAL CIRCUITS LAB

Prerequisites: Elements of Electrical Engineering
  Course Objectives:
  - To measure the electrical parameters for different types of DC and AC
    circuits usingconventional and theorems approach.
  - To study the transient response of various R, L and C circuits using different
    excitations.

Course Outcomes:
After learning the contents of this paper the student must be able to
  - Verify the basic Electrical circuits through different experiments.
  - Evaluate the performance calculations of network theorems
  - Evaluate the performance of balanced loads.
  - Analyze the transient responses of R, L and C circuits for different input conditions.

List of experiments are required to be conducted any 10
   1. Verification of KVL and KCL
   2. Verification of Thevenin's and Norton's theorem
   3. Verification of Superposition theorem
   4. Calculations and Verification of Impedance and Current of RL, RC and RLC series
      circuits
   5. Verification of Reciprocity and Milliman's Theorem.
   6. Verification of Maximum Power Transfer Theorem.
   7. Determination of form factor for non-sinusoidal waveform
   8. Measurement of Active Power for Star and Delta connected balanced loads.
   9. Measurement of Reactive Power for Star and Delta connected balanced loads.
   10. Determination of Resonance Frequency, Bandwidth and Quality factor of series
       RLC circuits.
   11. Node Voltage/Mesh Current analysis using suitable simulation tool.
   12. Verification of Thevenin's & Superposition Theorem using suitable simulation
       tool.
   13. To draw the locus Diagrams of RL (L-Varying) and RC (C-Varying) Series Circuits.

TEXTBOOKS:

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 4th Edition, 2019.
2. MS Naidu and S Kamakshaiah, "Basic Electrical Engineering", Tata McGraw Hill, 2nd Edition, 2008.

REFERENCE BOOKS:

1. P.Ramana, M.Suryakalavathi, G.T.Chandrasheker,"Basic Electrical Engineering", S.Chand, 2ndEdition, 2019.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009
3. M.S.Sukhija, T.K.Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford, 1st Edition, 2012.
4. Abhijit Chakrabarthi, Sudipta Debnath, Chandan Kumar Chanda, "Basic ElectricalEngineering", 2nd Edition, McGraw Hill, 2021.
5. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
6. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
7. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

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ELECTRICAL& ELECTRONICS ENGINEERING

B.Tech I Year II Semester   **L/T/P/C**
                                                                                 3/1/0/4

MATHEMATICAL TRANSFORMS (D2BSM3)

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

 CO1: Select and use the appropriate shift theorems in finding Laplace and inverse Laplace transforms.

CO2: Use Laplace transforms techniques for solving differential equations.

CO3: One will be able to find the expansion of a given function by Fourier series.

CO4: Evaluating any periodic function in term of sines and cosines.

CO5: Evaluating a non-periodic function in terms of sine and cosine transforms.

CO6: Understanding and apply Z-transforms, Inverse Z-transforms to solve Difference equations.

UNIT I
Laplace Transforms: Laplace transforms of standard functions- shifting theorems- derivatives and integrals -properties- unit step function- Dirac's delta function- Periodic function

UNIT II
Inverse Laplace transforms and applications: Inverse Laplace transforms -Shifting theorems - convolution theorem (without proof) applications- solving ordinary differential equations (initial value problems) using LaplaceTransforms.

UNIT III
Fourier series: Introduction- periodic function-Fourier expansion of periodic functions- Dirichlets conditions Fourier series of even and odd functions- change of interval - half-range Fourier sine and cosine Series.

UNIT IV
Fourier Transforms: Fourier integral theorem (without proof)- Fourier sine and cosine integrals- sine andcosine transform-properties-inverse transforms- finite Fourier transforms.

UNIT V
Z Transforms and applications: Z Transforms and inverse Z transforms-properties-damping rule-shifting properties- initial and final value theorems -convolution theorem,-applications-solution of difference equation byZ-transforms.

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
2. Reprint-2008.
3. B.S. Grewal- Higher Engineering Mathematics- Khanna Publishers- 36th Edition-2010.
4. Advanced Engineering Mathematics by S.R.K. Iyengar R.K. Jain – Narosa Publication

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APPLIED CHEMISTRY (D2BSAC1)

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

Course Outcomes:
1. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
2. They will acquire the Knowledge of chemistry in Batteries.
3. They can learn the fundamentals and general properties of polymers and their engineering materials.
4. Students are able to understand the functioning of Engineering Materials.
5. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT I
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 II
Battery Chemistry & Corrosion
Introduction -Classification of batteries- primary, secondary batteries with examples. Basic requirements for commercial batteries. Construction, working and applications of Lithium-ion battery, Applications of Li-ion battery. Fuel Cells-Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell

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 III
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 and 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.

Biodegradable polymers; Concept and advantages- Poly lactic acid and Poly vinyl alcohol and Applications.

UNIT IV
Energy Sources

Introduction, Calorific value of fuel – HCV, LCV- Dulongs 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
Engineering Materials

Cement: Portland cement, its composition, setting and hardening.

Lubricants: Classification of lubricants with examples-characteristics of a good lubricants - mechanism of lubrication (thick film, thin film and extreme pressure)- properties of lubricants: viscosity, cloud point, pour point, flash point and fire point.

Refractories: Classification & Characteristics of a Good Refractory.

TEXTBOOKS:
1. Engineering Chemistry, Dr. Bharathi Kumari Yalamanchili, VGS Techno series Publishing Company, 2018
2. Engineering Chemistry P.C. Jain and M. Jain, Dhanpatrai & CO Publishing Company, 2010
3. Engineering Chemistry Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 2016
4. A textbook of Engineering Chemistry M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.
5. Textbook of Engineering Chemistry Jaya Shree Anireddy, Wiley Publications.

REFERENCEBOOKS:
1. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi (2015).
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi (2011).

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                                                                                          3/0/ 0/3

NETWORK ANALYSIS (D2ESNA1)

Prerequisites: Mathematics

Course Objectives:
- To study the transient analysis of various R, L and C circuits for different inputs
- To understand the Fourier series and Laplace transformation.
- To learn about two-port networks and concept of filters.

Course Outcomes: After learning the contents of this paper the student must be able to
- Observe the response of various R, L and C circuits for different excitations.
- Examine the behavior of circuits using Fourier, Laplace transforms and transfer function of single port network.
- Obtain two port network parameters and applications and design of various filters.

UNIT I
Transient analysis of Series circuits: Transient response of R, L & C circuits, Formulation of integral differential equations, Initial conditions, Transient Response of RL, RC and RLC networks subjected to internal energy, Response to impulse, step, and ramp, exponential and sinusoidal excitations.

UNIT II
Transient analysis of Parallel Circuits:
Transient Response of RL, RC and RLC networks subjected to internal energy, Response to impulse, step, and ramp, exponential and sinusoidal excitations.

UNIT III
Electrical circuit Analysis using Laplace Transforms: Application of Laplace Transforms to RL, RC and RLC (series and parallel) Networks for impulse, step, and ramp, exponential and sinusoidal excitations

UNIT IV
Two port network parameters: Open circuit impedance, short-circuit admittance, Transmission, Hybrid parameters & inter-relationships, Series, parallel and cascade connection of two port networks, System function, and Impedance and admittance functions.

UNIT V
Filters: Classification of filters – Low pass, High pass, Band pass and Band Elimination, Constant-k and M-derived filters-Low pass and High pass Filters and Band pass and Band elimination filters (Elementary treatment only)

TEXTBOOKS:

1.   Van Valkenburg M.E, ‑Network Analysis‖, Prentice Hall of India, 3rd Edition, 2000.
2.   Ravish R Singh, ‑Network Analysis and Synthesis‖, McGrawHill, 2nd Edition, 2019.

REFERENCE BOOKS:

1.   B. Subramanyam, ‑Electric Circuit Analysis‖, Dreamtech Press & Wiley, 2021.
2.   James W. Nilsson, Susan A.Riedel, ―Electric Circuits‖, Pearson, 11th Edition, 2020.
3.   A Sudhakar, Shyammohan S Palli, ‑Circuits and Networks: Analysis and Synthesis‖, McGraw Hill, 5th Edition, 2017.
4.   Jagan N.C, Lakshrninarayana C., ‑Network Analysis‖, B.S. Publications, 3rd Edition, 2014.
5.   William Hayt H, Kimmerly Jack E. and Steven Durbin M, ‑Engineering Circuit Analysis‖, McGraw Hill, 6th Edition, 2002.
6.   Chakravarthy A., ‑Circuit Theory‖, Dhanpat Rai & Co., First Edition, 1999.

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                                                                                    2/0/0/2

ENGLISH FOR SKILL ENHANCEMENT (D1HSE1)

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 theoreticaland 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 invarious 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 ProperPunctuation- 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 forPractice
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 andCulture"* 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 notcovered 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.

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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B.Tech I Year II Semester

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BASIC WORKSHOP (D1ESBW1)

Course Objectives:

1. To Study different hand operated power tools, uses and their demonstration.
2. To gain basic working knowledge required for the production of engineering products.
3. To provide hands on experience about use of different engineering materials, tools, equipment and processes those are common in the engineering field.
4. To develop a right attitude, team working, precision and safety at workplace.
5. It explains the construction, function, use and application of different working tools, equipment and machines.
6. To study commonly used carpentry joints.
7. To have practical exposure to various welding and joining processes.
8. To identify and use marking tools, hand tools, measuring equipment and to work in order to obtain prescribed tolerances.

Course Outcomes:

Completion of the course, the students will be able to:
1. Ability to design and model different prototypes in the carpentry trade such as cross lap joint, Dove tail joint.
2. Ability to design and model various basic prototypes in the trade of fitting such as straight and L fit.
3. Ability to make various basic prototypes in the trade of Tin smithy such as rectangular tray, Scoop.
4. Ability to perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, Series wiring.
5. Ability to design and model various basic prototypes in the trade of Welding such as Lap joint, Butt joint.

TRADES FOR EXERCISES:
At least two exercises from each trade:
1. Machine shop
2. Carpentry shop
3. Fitting shop
4. Electrical Wiring / House wiring
5. Welding shop (Arc welding and Gas welding)
6. Black Smithy, Tin-Smithy and Development of jobs carried out and soldering

TRADES FOR DEMONSTRATION &EXPOSURE:
   Plumbing, Metal Cutting (Power Hack saw machine), Metal Cutting (Water Plasma), Power tools in construction, Foundry.

TEXT BOOKS:
1. Workshop Practice, B. L. Juneja, Cengage Publications.
2. Workshop Manual, K. Venugopal, Anuradha Publications.

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ELECTRICAL & ELECTRONICS ENGINEERING

B.Tech I Year II Semester   **L/T/P/C**
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APPLIED CHEMISTRY LAB (D2BSAC2)

Course Objectives

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

1. Estimation of hardness of water to check its suitability for drinking purpose.
2. Students are able to perform estimations of acids and bases using conductometry, potentiometry and pH metry methods.
3. Students will learn to prepare polymers.
4. 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:

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

List of Experiments:

1. **Volumetric Analysis:** Estimation of Hardness of water by EDTA Complexometry method.
2. **Conductometry:** Estimation of the concentration of an acid by Conductometry.
3. **Potentiometry:**
   a) Estimation of the concentration of an acid by Potentiometry
   b) Estimation of the amount of Fe^{+2} by Potentiomentry.
4. **pH Metry:** Determination of an acid concentration using pH meter.
5. **Preparations:** Preparation of Bakelite.
6. **Lubricants:**
   a)   Estimation of acid value of given lubricant oil.
   b)   Estimation of Viscosity of lubricant oil using Ostwald's Viscometer.

7. **Virtual lab experiments**

a)   Construction of Fuel cell and it's working.

b)   Smart materials for Biomedical applications

8. **Additional Experiments:**
   a) Thin layer Chromatography calculation of R_f values
   b) Determination of Surface tension of given liquid by using Stalagmometer.
   c) 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,New Delhi (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 Publications Ltd. New Delhi (2007)

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ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB (D1HSE2)

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

Course Outcomes
Students will be able to:
1. Understand the nuances of English language through audio- visual experience and group activities.
2. Neutralize their accent for intelligibility
3. 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 in sentences – Intonation.
Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms- Stress pattern in sentences – 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 - IIICALL 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:
1. Cambridge Advanced Learners' English Dictionary with CD.
2. Grammar Made Easy by Darling Kindersley.
3. Punctuation Made Easy by Darling Kindersley.
4. Oxford Advanced Learner's Compass, 10th Edition.
5. English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
6. English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
7. English Vocabulary in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
8. TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).
9. Digital All
10. 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.*
5. Orient Black Swan Pvt. Ltd.
6. Mishra, Veerendra et al. (2020). *English Language Skills: A Practical Approach.* Cambridge University Press.

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NETWORK ANALYSIS LAB (D2ESNA2)

Prerequisites: Elements of Electrical Engineering & Electrical Circuit Analysis
Course Objectives:
- To design electrical systems and analyze them by applying various Network Theorems
- To measure three phase Active and Reactive power.
- To understand the locus diagrams and concept of resonance.

Course Outcomes: After learning the contents of this paper the student must be able to
- Analyze complex DC and AC linear circuits
- Apply concepts of electrical circuits across engineering
- Evaluate response of a given network by using theorems.

List of experiments are required to be conducted any 10

1. To draw the locus Diagrams of RL (R-Varying) and RC (R-Varying) Series Circuits.
2. Transient response of series RL, RC & RLC circuits for DC Excitation
3. Determination of Time response of first order RL and RC circuit for periodic non –sinusoidal inputs – Time Constant and Steady state error.
4. Determination of Two port network parameters – Z & Y parameters.
5. Determination of Two port network parameters – A, B, C, D parameters & Hybrid parameters.
6. Determination of Co-efficient of Coupling and Separation of Self and Mutualinductance in a Coupled Circuits.
7. Frequency domain analysis of Low-pass filter.
8. Frequency domain analysis of Band-pass filter.
9. Harmonic Analysis of non-sinusoidal waveform signals using Harmonic Analyzerand plotting frequency spectrum. .
10. Frequency domain analysis of High-pass filter.
11. Frequency Domain analysis of Low pass, High-pass filters and Band pass filter using suitable simulation tools.
12. Simulation of Two-port Network using suitable simulation tools.
13. Determination of Time response of first order RLC circuit for periodic non – sinusoidalinputs – Time Constant and Steady state error.

TEXTBOOKS:

1. Van Valkenburg M.E, ‒Network Analysis‖, Prentice Hall of India, 3rd Edition, 2000.
2. Ravish R Singh, ‒Network Analysis and Synthesis‖, McGrawHill, 2nd Edition, 2019.

REFERENCE BOOKS:

1. B. Subramanyam, ‒Electric Circuit Analysis‖, Dreamtech Press & Wiley, 2021.
2. James W.Nilsson, Susan A. Riedel, ‒Electric Circuits‖, Pearson, 11th Edition, 2020.
3. A Sudhakar, Shyammohan S Palli, ‒Circuits and Networks:
   Analysis and Synthesis‖, McGrawHill, 5th Edition, 2017.
4. Jagan N.C, Lakshrninarayana C., ‒Network Analysis‖, B.S. Publications, 3rd Edition, 2014.
5. William Hayt H, Kimmerly Jack E. and Steven Durbin M,
   ‒Engineering Circuit Analysis‖, McGrawHill, 6th Edition, 2002.
6. Chakravarthy A., ‒Circuit Theory‖, Dhanpat Rai & Co., First Edition, 1999.

ELECTRICAL & ELECTRONICS ENGINEERING

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PYTHON LAB (D2ESPP1)

Course Objectives:

To install and run the Python interpreter To learn control structures.

To Understand Lists, Dictionaries in python To Handle Strings and Files in

Python

Course Outcomes:

After completion of the course, the student should be able to

● Develop the application specific codes using python.
● Understand Strings, Lists, Tuples and Dictionaries in Python
● Verify programs using modular approach, file I/O, Python standard library
● Implement Digital Systems using Python

Note: The lab experiments will be like the following experiment examples

Week -1:

1. i) Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
   ii) Start the Python interpreter and type help() to start the online help utility.
2. Start a Python interpreter and use it as a Calculator.
3.
   i) Write a program to calculate compound interest when principal, rate and number of periods are given.
   ii) Given coordinates (x1, y1), (x2, y2) find the distance between two points
4. Read name, address, email and phone number of a person through keyboard and print the details.

Week - 2:

1. Print the below triangle using for loop.

5
   4 4
   3 3 3
   2 2 2 2
   1 1111

2. Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use 'if-else-if' ladder)
3. Python Program to Print the Fibonacci sequence using while loop
4. Python program to print all prime numbers in a given interval (use break)

Week - 3:

1. i) Write a program to convert a list and tuple into arrays.
   ii)Write a program to find common values between two arrays.
2. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.
3. Write a function called palindrome that takes a string argument and returnsTrue if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string.

Week - 4:

1. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
2. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.

   i). Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
   ii). The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and the empty string.
   iii). Write a python code to read dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.
3. i) Add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'
   ii)Remove the given word in all the places in a string?
   iii) Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the letters in the word by corresponding letters in lower case without using a built-in function?
4. Writes a recursive function that generates all binary strings of n-bit length

Week - 5:

1. i) Write a python program that defines a matrix and prints
   ii)Write a python program to perform addition of two square matrices
   iii) Write a python program to perform multiplication of two square matrices
2. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.
3. Use the structure of exception handling all general purpose exceptions.

Week-6:

1. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.
   b. Add an attribute named color to your Rectangle objects and modify draw_rectangle so that it uses the color attribute as the fill color.
   c. Write a function called draw_point that takes a Canvas and a Point as arguments and draws a representation of the Point on the Canvas.
   d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects.
   Write a function called draw_circle that draws circles on the canvas.
2. Write a Python program to demonstrate the usage of Method Resolution Order (MRO) in multiple levels of Inheritances.
3. Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week- 7

1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.
3. Write a Python code to Read text from a text file, find the word with most number of occurrences
4. Write a function that reads a file *file1* and displays the number of words, number of vowels, blank spaces, lower case letters and uppercase letters.

Week - 8:

1. Import numpy, Plotpy and Scipy and explore their functionalities.
2. a) Install NumPy package with pip and explore it.
3. Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR
4. Write a program to implement Half Adder, Full Adder, and Parallel Adder
5. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

TEXT BOOKS:

1. Supercharged Python: Take your code to the next level, Overland
2. Learning Python, Mark Lutz, O'reilly

REFERENCE BOOKS:

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications, Sheetal Taneja, Naveen Kumar, Pearson
3. Programming with Python, A User's Book, Michael Dawson, Cengage Learning, India Edition

4. Think Python, Allen Downey, Green Tea Press
5. Core Python Programming, W. Chun, Pearson
6. Introduction to Python, Kenneth A. Lambert, Cengage

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
(Sponsored by TKR Educational Society , Approved by AICTE, Affiliated by JNTUH, Accredited by NAAC with 'A' Grade)

ELECTRICAL & ELECTRONICS ENGINEERING

B.Tech. I Year II Semester   L/T/P/C
                                                                   3/0/0/0

ENVIRONMENTAL SCIENCE (R22)

COURSE OBJECTIVES:
This course provides elaborate analysis effect on environment and the ecosystem due to Human interferences. The topics covered in this course are bio-diversity; Environmental Pollution; Natural Resources; Social Issues; Human population and the Environment. At the end of the course, the student would be able to assess the various issues in the environment and give engineering solutions with regard to human activities.

COURSE OUTCOMES:
1. Ability to understand the scientific and economical solutions to environmental problems affecting the natural resources and the biodiversity.
2. Ability to associate with social issues, human population and its environment.
3. Ability to apply the techniques to solve pollution problems and to preserve the natural resources which in turn helps in sustainable development.
4. Ability to analyse the social issues and its impact on environment and the human world.

UNIT I
Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, Structure, and function of an eco-system, Food chains, food webs, and ecological pyramids. Flow of Energy, Bio-geochemical cycles, Bio-accumulation, Bio-magnification, eco-system value, services and carrying capacity,

UNIT II
Natural Resources: Classification of Resources: Living and Non-Living resources, Water Resources: use and over utilization of surface and ground water, floods and droughts, Dams: Benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land Resources: Forest resources, Energy Resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy source, case studies.

UNIT III
Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and eco-system diversity. Value of bio-diversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of bio-diversity: In-situ and Ex-situ conservation. National bio-diversity act.

UNIT IV
Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and Secondary Pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Sources and types of pollution, drinking water quality standards.
Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil.
Noise Pollution: Sources and Health hazards, Standards, Solid Waste: Municipal Solid Waste Management, composition and characteristics of e-Waste and its management.
Pollution control technologies: Wastewater Treatment methods: Primary, Secondary and Tertiary.
Overview of air pollution control technologies, Concepts of bio-remediation. Global Environmental Issues and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification.

UNIT V
Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects, Air Act-1981,Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, bio-medical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and socio-economic aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

TEXT BOOKS:

1. Gilbert M.Masters, "Introduction to Environmental Engineering and Science", 2nd Edition, Pearson Education, 2004.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2006.Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
3. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL LearningPrivate Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHILearning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley India Edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
Introduction to Environmental Science by Y. Anjaneyulu, BS.