w.e.f. 2023-24

DIET23

B. Tech.
INFORMATION TECHNOLOGY
(B.Tech 1st Year Syllabus)

Department of Information Technology

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY

(AUTONOMUS)

(Approved by AICTE, Accredited by NBA (EEE|ME|ECE|CSE), Affiliated to JNTUK, Kakinada)

Ganguru, Vijayawada

Andhra Pradesh - 521139,

INDIA.

www.diet.ac.in

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Information Technology

VISION – MISSION - PEOs

Institute Vision	Pioneering Professional Education through Quality
Institute Mission	Providing Quality Education through state-of-art infrastructure, laboratories and committed staff. Moulding Students as proficient, competent, and socially responsible engineering personnel with ingenious intellect. Involving faculty members and students in research and development works for betterment of society.
Department Vision	To become a leading center in Information Technology education and research, fostering innovation, technical expertise, and responsibility
Department Mission	• Provide learner centric education with state-of-the-art facilities. • Impart problem-solving skills to become pioneers in the global competition through trainings and various activities. • Equip learners with employability and entrepreneurial skills. • Promote Research environment and inculcate corporate social responsibility.
Program Educational Objectives (PEOs)	Graduates of Information technology will: PEO1: Solve multidisciplinary problems and innovate through core IT knowledge, excelling in professional careers or higher studies. PEO2: Integrate IT across domains, demonstrate ethical professionalism, and embody environmental consciousness as competent, well-rounded individuals. PEO3: Engage in continuous learning, adapting to evolving technologies while promoting societal betterment through responsible innovation and research.

DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Computer Science & Engineering
POs/PSOs

List Program Outcomes

1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

List Program Specific Outcomes

PSO1: Design and develop the Information Technology based AI systems and software applications with technical and professional skills.

PSO2: Excel in higher studies, secure employment in diverse technology sectors, contribute to research, and entrepreneurship.

B. Tech.–I Year I Semester

S. No.	Category	Title	L/D	T	P	Credits
1	BS&H	Engineering Physics	3	0	0	3
2	BS&H	Linear Algebra &Calculus	3	0	0	3
3	Engineering Science	Basic Electrical & Electronics Engineering	3	0	0	3
4	Engineering Science	Engineering Graphics	1	0	4	3
5	Engineering Science	Introduction to Programming	3	0	0	3
6	Engineering Science	IT Workshop	0	0	2	1
7	BS&H	Engineering Physics Lab	0	0	2	1
8	Engineering Science	Electrical & Electronics Engineering Workshop	0	0	3	1.5
9	Engineering Science	Computer Programming Lab	0	0	3	1.5
10	BS&H	NSS/NCC/Scouts & Guides/Community Service	-	-	1	0.5
Total			**13**	**00**	**15**	**20.5**

B. Tech.–I Year II Semester

S. No.	Category	Title	L	T	P	Credits
1	BS&H	Communicative English	2	0	0	2
2	BS & H	Engineering Chemistry/Chemistry/Fundamental Chemistry	3	0	0	3
3	Engineering Science	Differential Equations &Vector Calculus	3	0	0	3
4	Engineering Science	Basic Civil& Mechanical Engineering	3	0	0	3
5	Professional Core	Engineering Mechanics/Network Analysis/ Data structures (Branch specific)	3	0	0	3
6	BS&H	Communicative English Lab	0	0	2	1
7	BS&H	Engineering Chemistry / Chemistry /Fundamental Chemistry Lab	0	0	2	1
8	Engineering Science	Engineering Workshop	0	0	3	1.5
9	Professional Core	Engineering Mechanics & Building Practices Lab Engineering Mechanics Lab/Network Analysis Lab / Data structures Lab	0	0	3	1.5
10		Health and wellness, Yoga and Sports	-	-	1	0.5

Total	14	00	11	19.5

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Course Code:
Engineering Physics

Year & Semester: I- I

Course Category:	**BS**/ES/PC/PE/OE/MC/SC	Credits: 3			
Course Type:	**Theory** / Tutorial /Practical	Lecture-Tutorial-Practice:	3	0	0
Prerequisites	Basic concepts of Physics and units of physical parameters	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Distinguish the phenomena of Interference, Diffraction, Polarisation and determine the wavelength of given light using these phenomena.	Analysing
CO2	Analyze the crystalline structure by Bragg's X-ray diffractometer	Analysing
CO3	Classify the magnetic materials and apply the magnetic, dielectric materials for given engineering applications	Analysing
CO4	Calculate the energy of quantum particle at different energy levels.	Applying
CO5	Classify the semiconductors and identify the type of semiconductor using Hall effect	Analysing

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3												
CO2	3	3												
CO3	3	3												
CO4	3	2												
CO5	3	3												

COURSE CONTENT:

UNIT-1: Wave Optics

Interference: Introduction - Principle of superposition –Interference of light - Interference in thin films (Reflection Geometry) & applications - Colours in thin films- Newton's Rings, Determination of wavelength and refractive index. Diffraction: Introduction - Fresnel and Fraunhofer diffractions - Fraunhofer diffraction due to single slit, double slit & N-slits (Qualitative) – Diffraction Grating - Dispersive power and resolving power of Grating (Qualitative). Polarization: Introduction -Types of polarization - Polarization by reflection, refraction and Double refraction - Nicol's Prism -Half

wave and Quarter wave plates.

UNIT-2: Crystallography and X-ray diffraction

Crystallography: Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (hkl) planes.

X-ray diffraction: Bragg's law - X-ray Diffractometer – crystal structure determination by Laue's and powder methods

UNIT-3: Dielectric and Magnetic Materials

Dielectric Materials: Introduction - Dielectric polarization - Dielectric polarizability, Susceptibility, Dielectric constant and Displacement Vector – Relation between the electric vectors - Types of polarizations- Electronic (Quantitative), Ionic (Quantitative) and Orientation polarizations (Qualitative) - Lorentz internal field - Clausius- Mossotti equation - complex dielectric constant – Frequency dependence of polarization – dielectric loss

Magnetic Materials: Introduction - Magnetic dipole moment - Magnetization-Magnetic susceptibility and permeability – Atomic origin of magnetism - Classification of magnetic materials: Dia, para, Ferro, anti-ferro & Ferri magnetic materials - Domain concept for Ferromagnetism & Domain walls (Qualitative) - Hysteresis - soft and hard magnetic materials.

UNIT-4: Quantum Mechanics and Free electron Theory

Quantum Mechanics: Dual nature of matter – Heisenberg's Uncertainty Principle – Significance and properties of wave function – Schrodinger's time independent and dependent wave equations– Particle in a one-dimensional infinite potential well. Free Electron Theory: Classical free electron theory (Qualitative with discussion of merits and demerits) – Quantum free electron theory – electrical conductivity based on quantum free electron theory - Fermi-Dirac distribution - Density of states - Fermi energy

UNIT-5: Semiconductors

Semiconductors: Formation of energy bands – classification of crystalline solids - Intrinsic semiconductors: Density of charge carriers – Electrical conductivity – Fermi level – Extrinsic semiconductors: density of charge carriers – dependence of Fermi energy on carrier concentration and temperature - Drift and diffusion currents – Einstein's equation – Hall effect and its applications.

TEXT BOOKS:

[1] A Text book of Engineering Physics, M. N. Avadhanulu, P.G.Kshirsagar & TVS Arun Murthy, S. Chand Publications, 11th Edition 2019.

[2] Engineering Physics - D.K.Bhattacharya and Poonam Tandon, Oxford press (2015)

REFERENCE BOOKS:

(i) Engineering Physics - B.K. Pandey and S. Chaturvedi, Cengage Learning 2021.

(ii) Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.

(iii) Engineering Physics - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press. 2010.

(iv) Engineering Physics - M.R. Srinivasan, New Age international publishers (2009).

E-RESOURCES/DIGITAL MATERIAL:

(a) https://www.loc.gov/rr/scitech/selected-internet/physics.html

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Course Code:
Linear Algebra and Calculus

Year & Semester: I- I

Course Category:	BS	Credits: 3			
Course Type:	Theory / Tutorial	Lecture-Tutorial-Practice:	3	0	0
Prerequisites	Basics of Matrices, Differentiation & Integration. Convergence of a Series.	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Test the Linear system's consistency and determine its solution.	4-Analyzing
CO2	Apply eigen values and eigen vectors to reduce a quadratic form to its canonical form.	3-Applying
CO3	Apply mean value theorems to obtain series expansions of single variable functions.	3-Applying
CO4	Use partial differentiation in optimizing multi variable functions.	3-Applying
CO5	Evaluate multiple integrals and find area / volume of bounded regions.	5-Evaluating

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO2	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO3	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO4	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO5	3	3	-	-	-	-	-	-	-	-	-	3	3	3

COURSE CONTENT:

UNIT-1: Matrices:
Rank of a matrix by echelon form, normal form. Cauchy–Binet formulae (without proof). Inverse of Non- singular matrices by Gauss-Jordan method, System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations by Gauss elimination method, Jacobi and Gauss Seidel Iteration Methods.

UNIT-2: Eigen values, Eigen Vectors and Orthogonal Transformation:
Eigenvalues, Eigenvectors and their properties, Diagonalization of a matrix, Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem, Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonicalforms by Orthogonal Transformation.

UNIT-3: Calculus

Mean Value Theorems: Rolle's Theorem, Lagrange's mean value theorem with their geometrical interpretation, Cauchy's mean value theorem, Taylor's and Maclaurin theorems with remainders (without proof), Problems and applications on the above theorems.

UNIT-4: Partial differentiation and Applications (Multi variable Calculus):

Functions of several variables: Continuity and Differentiability, Partial derivatives, totalderivatives, chain rule, Directional derivative, Taylor's and Maclaurin's series expansion offunctions of two variables. Jacobians, Functional dependence, maxima and minima of functions of two variables, method of Lagrange multipliers.

UNIT-5: Multiple integrals (Multi variable Calculus):

Double integrals, triple integrals, change of order of integration, change of variables to polar, cylindrical and spherical coordinates. Finding areas (by double integrals) and volumes (by double integrals and triple integrals).

TEXT BOOKS:

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

REFERENCE BOOKS:

(i) Engineering Mathematics-I (Linear Algebra and Calculus) by T.K.V. Iyengar et.al., S Chand and Company Ltd
(ii) Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, PearsonPublishers, 2018, 14th Edition.
(iii) Advanced Engineering Mathematics, Dennis G. Zill and Warren S. Wright, Jones andBartlett, 2018.
(iv) Advanced Modern Engineering Mathematics, Glyn James, Pearson publishers, 2018, 5thEdition.
(v) Advanced Engineering Mathematics, Michael Greenberg, Pearson publishers, 9thedition.
(vi) Higher Engineering Mathematics, H. K Das, Er. Rajnish Verma, S. Chand Publications, 2014, Third Edition (Reprint 2021)

E-RESOURCES/DIGITAL MATERIAL:

(a) http://www.nptelvideos.com/mathematics/
(b) https://www.digimat.in/111.html

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Course Code

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Year & Semester: I- I

Course Category:	BS/ES/**PC**/PE/OE/MC/SC	Credits: 3			
Course Type:	**Theory** / Tutorial /Practical	Lecture-Tutorial-Practice:	3	0	0
Prerequisites	To acquire fundamental knowledge in the field of Electrical and Electronics Engineering	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Describe the fundamentals of DC and AC circuits	Analysing
CO2	Demonstrate the Construction and Principle of operation of Electrical Machines and Measuring Instruments	Understanding
CO3	Calculate Electrical Load and Electricity Bill of residential and commercial buildings	Analysing
CO4	Deliver the fundamentals of Semiconductor Devices	Understanding
CO5	Test the Semiconductor Device applications, Principles of Digital Electronics.	Analysing

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3												
CO2	3	2												
CO3	3	3												2
CO4	3													
CO5	3	3												

COURSE CONTENT:

PART A: BASIC ELECTRICAL ENGINEERING

UNIT I DC & AC Circuits

DC Circuits: Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL & KVL, series, parallel, series-parallel circuits, Super Position theorem, Simple numerical problems.

AC Circuits: A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept of Impedance, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems).

UNIT II Machines and Measuring Instruments

Machines: Construction, principle and operation of (i) DC Motor, (ii) DC Generator, (iii)

Single Phase Transformer, (iv) Three Phase Induction Motor and (v) Alternator, Applications of electrical machines.

Measuring Instruments: Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments and Wheat Stone bridge.

UNIT III Energy Resources, Electricity Bill & Safety Measures

Energy Resources: Conventional and non-conventional energy resources; Layout and operation of various Power Generation systems: Hydel, Nuclear, Solar & Wind power generation.

Electricity bill: Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.

Equipment Safety Measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

Textbooks:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition 2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Mc Graw Hill, 2019, Fourth Edition

2. Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers, 2020

3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017

4. Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition.

PART B: BASIC ELECTRONICS ENGINEERING

UNIT I SEMICONDUCTOR DEVICES

Introduction - Evolution of electronics – Vacuum tubes to nano electronics - Characteristics of PN Junction Diode — Zener Effect — Zener Diode and its Characteristics. Bipolar Junction

Transistor — CB, CE, CC Configurations and Characteristics — Elementary Treatment of Small Signal CE Amplifier.

UNIT II BASIC ELECTRONIC CIRCUITS AND INSTRUMENTATION

Rectifiers and power supplies: Block diagram description of a dc power supply, working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator. Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response. Electronic Instrumentation: Block diagram of an electronic instrumentation system.

UNIT III DIGITAL ELECTRONICS

Overview of Number Systems, Logic gates including Universal Gates, BCD codes, Excess-3 code, Gray code, Hamming code. Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits–Half and Full Adders. Introduction to sequential circuits, Flip flops, Registers and counters (Elementary Treatment only)

Textbooks:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

Reference Books:

1. R. S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand & Co, 2010.
2. Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India, 2002.
3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education, 2009.

Web Resources:

1. https://nptel.ac.in/courses/108105053
2. https://nptel.ac.in/courses/108108076
3. https://nptel.ac.in/courses/117102061
4. https://nptel.ac.in/courses/117103063
5. https://nptel.ac.in/courses/117103064

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Course Code
ENGINEERING GRAPHICS

Year & Semester: I- I

Course Category:	**Engineering Science (ES)**	Credits : 3			
Course Type:	**Theory**	Lecture-Tutorial-Practice:	1	0	4
Prerequisites	Basic mathematics	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Understand the principles of engineering drawing, including engineering curves, scales.	3
CO2	Draw orthographic projections of the points and projections of lines inclined to one principal plane & inclined to both the planes	3
CO3	Draw Orthographic projections of planes, solids (simple position and inclined to both the planes)	3
CO4	Explain principles behind development of surfaces and Sections of solids in simple position only.	3
CO5	Draw orthographic and isometric views of different parts.	3

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	-	-	-	-	-	-	3	-	2	2	2	2
CO2	3	2	2	-	-	-	-	-	-	3	-	2	2	2	2
CO3	3	2	2	-	-	-	-	-	-	3	-	2	2	2	2
CO4	3	2	2	-	-	-	-	-	-	3	-	2	2	2	2
CO5	3	2	2	-	3	-	-	-	-	3	-	2	2	2	2

COURSE CONTENT:

UNIT I

Introduction: Lines, Lettering and Dimensioning, Geometrical Constructions and Constructing regular polygons by general methods.

Curves: construction of ellipse, parabola and hyperbola by general, Cycloids, Involutes, Normal and tangent to Curves.

Scales: Plain scales, diagonal scales and vernier scales.

UNIT II

Orthographic Projections: Reference plane, importance of reference lines or Plane, Projections of a point situated in any one of the four quadrants.

Projections of Straight Lines: Projections of straight lines parallel to both reference planes,

perpendicular to one reference plane and parallel to other reference plane, inclined to one reference plane and parallel to the other reference plane. Projections of Straight Line Inclined to both the reference planes

Projections of Planes: regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.

UNIT III

Projections of Solids: Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane and Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.

UNIT IV

Sections of Solids: Perpendicular and inclined section planes, Sectional views and True shape of section, Sections of solids in simple position only.

Development of Surfaces: Methods of Development: Parallel line development and radial line development. Development of a cube, prism, cylinder, pyramid and cone.

UNIT V

Conversion of Views: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.

Computer graphics: Creating 2D&3D drawings ofobjects including PCB and Transformations using Auto CAD (*Not for end examination*).

TEXT BOOKS:

[1]. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016.

REFERENCE BOOKS:

1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill, 2013.
2. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc,2009.
3. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill, 2017.

E-RESOURCES/DIGITAL MATERIAL:

a) https://nptel.ac.in/courses/112103019
b) https://archive.nptel.ac.in/courses/112/102/112102304/

Regulation
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Course Code

INTRODUCTION TO PROGRAMMING

Year & Semester: I- I

Course Category:	**Engineering Science (ES)**	Credits: 3			
Course Type:	**Theory**	Lecture-Tutorial-Practice:	3	0	0
Prerequisites	Basics Mathematics, Logical thinking and basics of Computers	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Illustrate basics of computers, problem solving techniques and introduction to C programming	2
CO2	Develop C programs using control statements	3
CO3	Apply concepts like arrays and strings in C	3
CO4	Analyze pointer concepts, structures, unions in C	4
CO5	Examine functions and concepts of File I/O in C	4

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate,**3** – High)

CO No.	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO 7**	**PO8**	**PO9**	**PO1 0**	**PO1 1**	**PO1 2**	**PSO1**	**PSO2**
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	3
CO2	3	-	-	-	-	-	-	-	-	-	-	-	3	3
CO3	3	-	-	-	-	-	-	-	-	-	-	-	3	3
CO4	-	3	-	-	-	-	-	-	-	-	-	-	3	3
CO5	-	3	-	-	-	-	-	-	-	-	-	-	3	3

COURSE CONTENT:

UNIT-1:
Introduction to Programming Languages, Basics of a Computer Program-Algorithms, flowcharts (Using DiaTool), pseudo code, Introduction to Compilation and Execution, Primitive Data Types, Variables and Constants, Basic Input and Output, Operators, Type Conversion and Casting, formatted IO,
Problem solving techniques: Algorithmic approach, Characteristics of algorithm, Example Programs

UNIT-2:
Control Structures: Simple sequential programs, Conditional Statements (if, if-else, if else ladder, Nested if, switch), Nesting, Loops (for, while, do-while), Break and Continue, Example Programs.

UNIT-3:
Arrays and Strings: Arrays indexing, Array Declaration and Initialization, programs with array of integers, two dimensional arrays, Introduction to Strings, String handling functions, Example Programs.

UNIT-4:
Pointers &User Defined Data types: Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers, Dynamic Memory Allocation functions, User-defined data types-Structures and Unions, Example Programs.

UNIT-5:
Functions &File Handling: Introduction to Functions, Function Declaration and Definition, Function call Return Types and Arguments, Recursion, modifying parameters inside functions using pointers, Arrays and Structures as parameters. Storage Class Modifiers, File Handling- Creation, Opening Modes, File IO

Textbooks:

1. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rdedition, 2011.
2. "The C Programming Language", Brian W.Kernighan and Dennis M.Ritchie, Prentice-Hall, 2015.
3. Schism's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996.
4. Let us C , Yaswanth Kanetkar, 16th Edition, BPB Publication, 2020.
5. Programming in ANSI C, McGraw Hill, seventh edition by E.Balagurusamy.2017

Reference Books:

1. Programming in C, Reema The raja, Oxford,2016,2nd edition
3. Programming In C, Ashok Kamthane, Second Edition, Pearson Publication, 2013
4. Problem solving using C , K Venugopal,3'd Edition, TMG Publication,2015
5. Anil B. Chaudhuri, "Flowchart and Algorithm Basics: The Art of Programming", Mercury Learning & Information, 2020.
6. Paul J. Dietel and Harvey M. Deitel, "C: How to Program", Prentice Hall, 8th edition (Jan 19, 2021)

E-Resources:
1. https://onlinecourses.nptel.ac.in/noc21_cs01/preview

Websites:
- http://www.c4learn.com/
- http://www.geeksforgeeks.org/c/
- http://nptel.ac.in/courses/122104019/
- http://www.learn-c.org/
- https://www.tutorialspoint.com/cprogramming/

Regulation
DIET23

Course Code
IT Workshop

Year & Semester: I- I

Course Category:	**Engineering Science (ES)**	Credits: 1			
Course Type:	**Practical**	Lecture-Tutorial-Practice:	0	0	2
Prerequisites		Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Identify, assemble the components of a computer	3
CO2	Configure, evaluate and select hardware platforms for the implementation and execution of computer applications, services and systems	5
CO3	Make use of tools for converting pdf to word and vice versa	3
CO4	Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheets, FOSS, LaTeX	3

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate,**3** – High)

CO No.	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	3
CO2	3	3	-	-	-	-	-	-	-	-	-	-	3	3
CO3	-	3	-	-	3	-	-	-	-	-	-	-	3	3
CO4	-	3	-	-	3	-	-	-	-	-	-	-	3	3

COURSE CONTENT:

PC Hardware & Software Installation

Task 1: 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.

Task2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with Aviva.

Task 4: Every student should install Linux on the computer. This computer should have windows

installed. The system should be configured as dual boot (VMware) with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task5: Every student should install BOSS on the computer. The system should be configured as dual boot (VMware) with both Windows and BOSS. Lab instructors should verify the installationand follow it up with a Viva

Internet&WorldWideWeb

Task1: 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, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task2: Web Browsers, Surfing the Web: Students customize their web browsers with the Leprosy settings, bookmarks, search toolbars and popup blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task3: Search Engines& Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet andwould be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active downloads to avoid viruses and/or worms.

LatexandWORD

Task 1 – Word Orientation: The mentor needs to give an overview of Latex and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of Latex and MS office equivalents (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using La Te Xandword–Accessing, overview of toolbars, saving files, Using help andresources, rulers, format painter in word.

Task 2: Using LaTeX and Word to create a project certificate. Features to be covered: -Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Task 3: 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.

Task4: Creating a News letter: Features to be covered:-Table of Content, News paper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

EXCEL

Excel Orientation: The mentor need stately the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered ineach. Using Excel–Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation,autofill, Formatting Text

Task 2: Calculating GPA -. Features to be covered:- Cell Referencing, Formulae in excel –average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Countfunction,

LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators,Conditionalformatting

POWERPOINT

Task 1: Students will be working on basic power point utilities and tools which help themcreate basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, WordArt, Formatting Text, BulletsandNumbering,Auto Shapes,Linesand ArrowsinPowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Task 3: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotted, notes etc), and Inserting–Back ground, textures, Design Templates, Hidden slides.

AITOOLS –ChatGPT

Task1: Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing in complete sentences to see how the model completes them.

- Ex: Prompt: "You area knowledge able AI. Please answer the following question: What is the capital of France?"

Task2: Creative Writing: Use the model as a writing assistant. Provide the beginning of a story or a description of ascend, and let the model generate there list of the content. This can be a fun way to brainstorm creative ideas

- Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating up wards. Write a story about how society adapted to this new reality."

Task 3: Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it into another language. Compare the output to see how accurate and fluent the translations are.

- Ex:Prompt: "Translate the following English sentence to French: 'Hello, how are youdoingtoday?'

TEXT BOOKS:

[1]Computer Fundamentals, Anita Goal, Pearson India Education,2017
[2] Introduction to PC Hardware Trouble Shooting Made Easy, Mike Meyers, McGraw Hill Education, 2017

REFERENCE BOOKS:

1. Comdex Information Technology course toolkit, VikasGupta, WILEY Dreamtech, 2003
2. The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dreamtech,2013,3rd edition

3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education,2012, 2nd edition
4. PC Hardware-A Handbook, Kate J.Chase, PHI(Microsoft), 2004
5. LaTeX Companion, Leslie Lamport, PHI/Pearson. 2nd Edition.
6. IT Essentials PC Hardware and Software Companion Guide, David Anfinsen and Ken Quamme.– CISCO Press, Pearson Education,3rd edition
7. IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan–CISCO Press, Pearson Education,3rd edition

Regulation
DIET23

Course Code
Engineering Physics Lab

Year & Semester: I- I

Course Category:	**BS**/ES/PC/PE/OE/MC/SC	Credits: 1			
Course Type:	Theory / Tutorial /**Practical**	Lecture-Tutorial-Practice:	0	0	2
Prerequisites	Basic concepts of Physics and units of physical parameters	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Examine the physical properties of light using interference, diffraction and polarization phenomena.	Applying
CO2	Determine the acceleration due to gravity and rigidity modulus of the material by pendulum methods.	Applying
CO3	Measure the frequency response by resonance using electrical method.	Applying
CO4	Demonstrate the magnetic and dielectric behaviour of materials	Applying
CO5	Analyze the characteristics of semiconducting materials	Applying

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3				3				3					
CO2	3				3				3					
CO3	3				3				3					
CO4	3				3				3					
CO5	3				3				3					

COURSE CONTENT:

List of Engineering Physics Experiments

1. Determination of radius of curvature of given plano-convex lens by Newton's rings.
2. Determination of wavelengths of different spectral lines in mercury spectrum using diffraction grating in normal incidence configuration.
3. Verification of Brewster's law.
4. Determination of acceleration due to gravity and radius of gyration by using compound pendulum.

5. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
6. Determination of frequency of electrically maintained tuning fork by Melde's experiment.
7. Determination of dielectric constant using charging and discharging method.
8. Study the variation of B versus H by magnetizing the magnetic material (B-H curve).
9. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
10. Determination of Hall voltage and Hall coefficient of a given semiconductor using Hall effect.

Additional Experiments:

11. Study frequency response of a LCR series resonance circuit.
12. Study the V-I characteristics of P-N junction diode.

References:

- A Textbook of Practical Physics - S. Balasubramanian, M.N. Srinivasan, S. Chand Publishers, 2017.

E-RESOURCES/DIGITAL MATERIAL

Web Resources
• www.vlab.co.in
• https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype

Regulation
DIET23

Course Code

ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP

Year & Semester: I- I

Course Category:	BS/ES/**PC**/PE/OE/MC/SC	Credits: 1.5			
Course Type:	Theory / Tutorial /**Practical**	Lecture-Tutorial-Practice:	0	0	3
Prerequisites	To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines, energy calculations, the principles of digital electronics and fundamentals of electronic devices & its applications	Continuous Evaluation	15M		
		Semester End Evaluation	35M		
		Total Marks	50M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Measure voltage, current and power in an electrical circuit	Analysis
CO2	Measure of Resistance using Wheat stone bridge	Application
CO3	Discover critical field resistance and critical speed of DC shunt generators.	Analysis
CO4	Investigate the effect of reactive power and power factor in electrical loads.	Analysis
CO5	Identify & testing of various electronic components.	Understanding
CO6	Understand the usage of electronic measuring instruments.	Understanding
CO7	Plot and discuss the characteristics of various electron devices.	Analysis
CO8	Explain the operation of a digital circuit.	Analysis

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	3						2	2		2			
CO2	3	2						2	2		2			
CO3	2	3						2	2		2			
CO4	2	3						2	2		2			
CO5	3	3						2	2		2			
CO6	3	2						2	2		2			
CO7	2	3						2	2		2			
CO8	2	3						2	2		2			

COURSE CONTENT:

PART A: ELECTRICAL ENGINEERING LAB

List of experiments:

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Measurement of Resistance using Wheat stone bridge
4. Magnetization Characteristics of DC shunt Generator
5. Measurement of Power and Power factor using Single-phase wattmeter
6. Measurement of Earth Resistance using Megger
7. Calculation of Electrical Energy for Domestic Premises

Reference Books:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition 2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

Note: Minimum Six Experiments to be performed.

PART B: ELECTRONICS ENGINEERING LAB

Course Objectives:

- To impart knowledge on the principles of digital electronics and fundamentals of electron devices & its applications.

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

CO1: Identify & testing of various electronic components.
CO2: Understand the usage of electronic measuring instruments.
CO3: Plot and discuss the characteristics of various electron devices.
CO4: Explain the operation of a digital circuit.

List of Experiments:

1. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Plot V – I characteristics of Zener Diode and its application as voltage Regulator.
3. Implementation of half wave and full wave rectifiers
4. Plot Input & Output characteristics of BJT in CE and CB configurations
5. Frequency response of CE amplifier.
6. Simulation of RC coupled amplifier with the design supplied
7. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
8. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs.

References:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009
3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009.

Note: Minimum Six Experiments to be performed. All the experiments shall be implemented using both Hardware and Software.

Regulation
DIET23

Course Code

COMPUTER PROGRAMMING LAB

Year & Semester: I- I

Course Category:	ES	Credits : 1.5			
Course Type:	Practical	Lecture-Tutorial-Practice:	0	0	3
Prerequisites		Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Solve simple programs using basic C programming concepts	3
CO2	Develop simple programs using control statements	3
CO3	Build program solutions using arrays and strings	3
CO4	Apply pointers concepts in programming	3
CO5	Apply structure and union, files concepts to use memory in programs.	3

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	-	-	-	3	-	-	-	3	-	-	3	3	3
CO2	3	-	-	-	3	-	-	-	3	-	-	3	3	3
CO3	3	-	-	-	3	-	-	-	3	-	-	3	3	3
CO4	3	-	-	-	3	-	-	-	3	-	-	3	3	3
CO5	3	-	-	-	3	-	-	-	3	-	-	3	3	3

COURSE CONTENT:

Exercise 1: Familiarization with programming environment

i) Basic Linux environment and its editors like Vi, Vim & Emacs etc.
ii) Exposure to Turbo C, gcc
iii) Writing simple programs using printf(),scanf()

Exercise 2: Converting algorithms/flowcharts into C Source code

i) Sum and average of 3numbers
ii) Conversion of Fahrenheit to Celsius and vice versa
iii) Simple interest calculation

Exercise 3: Simple computational problems using arithmetic expressions.

i) Finding the square root of a given number
ii) Finding compound interest

iii) Area of a triangle using heron's formulae
iv) Distance travelled by an object

Exercise 4: Simple computational problems using the operator' precedence and associativity

i) Evaluate the following expressions.
   a. A+B*C+(D*E)+F*G
   b. A/B*C-B+A*D/3
   c. A+++B---A
   d. J= (i++) +(++i)
ii) Find the maximum of three numbers using conditional operator
iii) Take marks of 5 subjects in integers, and find the total, average in float

Exercise 5: Problems using control statements

i) Write a C program to find the max and min of four numbers using if-else.
ii) Write a C program to generate electricity bill.
iii) Find the roots of the quadratic equation.
iv) Write a C program to simulate a calculator using switch case.
v) Write a C program to find the given year is a leap year or not

Exercise 6: Problems using control statements

i) Find the factorial of given number using any loop.
ii) Find the given number is a prime or not.
iii) Compute sine and cos series
iv) Checking a number palindrome
v) Construct a pyramid of numbers

Exercise 7: Using arrays

i) Find the min and max ofa1-D integer array.
ii) Perform linear search on 1D array.
iii) The reverse of a1D integer array
iv) Find 2's complement of the given binary number.
v) Eliminate duplicate elements in an array.

Exercise 8: arrays and strings

i) Addition of two matrices
ii) Multiplication two matrices
iii) Sort array elements using bubble sort
iv) Concatenate two strings without built-in functions
v) Reverse a string using built-in and without built-in string functions

Exercise 9: Pointers

i) Demonstrate dynamic memory allocation functions with example program.

Exercise 10: Structures and union

i) Write a C program to find the total, average of n students using structures
ii) Write a C program to illustrate Union

Exercise 11: Using functions

i) Write a C function to calculate NCR value.
ii) Write a C function to find the length of a string.
iii) Write a C function to transpose of a matrix.

Exercise 12: Using Recursion Function

i) Write a recursive function to generate Fibonacci series.
ii) Write a recursive function to find the LCM of two numbers.
iii) Write a recursive function to find the factorial of a number

Exercise 13: Simple functions using Call by reference, Dangling pointers.

i) Write a C program to swap two numbers using call by reference.
ii) Demonstrate Dangling pointer problem using a C program.
iii) Write a C program to copy one string into another using pointer.
iv) Write a C program to find no of lowercase, upper case, digits and other characters using pointers.

Exercise 14: File handling

i) Write a C program to write and read text in to a file.
ii) Copy the contents of one file to another file.
iii) Find no. of lines, words and characters in a file

TEXT BOOKS:

[1] Programming in ANSI C , McGrawHill, seventh edition by E.Balagurusamy.2017
[2] Programming in C, Reema Thareja, Second Edition, OXFORD, 2016.
[3] How to solve it by Computer, R. G. Dromey, and Pearson Education.
[4]Let us C , Yaswanth Kanetkar, 17th Edition, BPB Publication,2020.

REFERENCE BOOKS:

i) Brian W.Kernighan and Dennis M.Ritchie, The C Programming Language, Prentice-Hall of India, Second Edition, Pearson Education, 2015.
ii) C Programming, A Problem-SolvingApproach, Forouzan, Gilberg, Prasad, CENGAGE,2011
iii) Programming In C, Ashok Kamthane, Second Edition, Pearson Publication,2013
iv) (v) Problem solving using C , K Venugopal,3'd Edition, TMG Publication,2015
v) (vi)Anil B. Chaudhuri, "Flowchart and Algorithm Basics: The Art of Programming", Mercury Learning & Information, 2020.
vi) (vii)Paul J. Dietel and Harvey M. Deitel, "C: How to Program", Prentice Hall, 8th edition (Jan 19, 2021)

E-RESOURCES/DIGITAL MATERIAL:

a) https://www.geeksforgeeks.org/c-programming-examples/
b) https://www.studytonight.com/c/programs/

c) http://www.w3schools.com/
d) http://www.learn-c.org/
e) https://www.tutorialsyoint.com/cprogramming/
f) https://www.hackerrank.com/
g) https://www.codechef.com/
h) https://www.topcoder.com/

Regulation
DIET23

Course Code

NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE

Year & Semester: I- I

Course Category:	BS/ES/PC/PE/OE/MC/SC	Credits : 0.5			
Course Type:	Theory / Tutorial /Practical	Lecture-Tutorial-Practice:	0	0	1
Prerequisites		Continuous Evaluation			
		Semester End Evaluation			
		Total Marks	100M		

NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE

(Common to All branches of Engineering)

Course Objectives:

The objective of introducing this course is to impart discipline, character, fraternity, teamwork, social consciousness among the students and engaging them in selfless service.

Course Outcomes: After completion of the course the students will be able to

CO1: Understand the importance of discipline, character and service motto.
CO2: Solve some societal issues by applying acquired knowledge, facts, and techniques.
CO3: Explore human relationships by analyzing social problems.
CO4: Determine to extend their help for the fellow beings and downtrodden people.
CO5: Develop leadership skills and civic responsibilities.

UNIT I Orientation

General Orientation on NSS/NCC/ Scouts & Guides/Community Service activities, career guidance.

Activities:

i Conducting –ice breaking sessions-expectations from the course-knowing personal talents and skills
ii Conducting orientations programs for the students –future plans-activities-releasing road map etc.
iii Displaying success stories-motivational biopics- award winning movies on societal issues etc.
iv Conducting talent show in singing patriotic songs-paintings- any other contribution.

UNIT II Nature & Care

Activities:

i Best out of waste competition.
ii Poster and signs making competition to spread environmental awareness.
iii Recycling and environmental pollution article writing competition.
iv Organising Zero-waste day.
v Digital Environmental awareness activity via various social media platforms.
vi Virtual demonstration of different eco-friendly approaches for sustainable living.
vii Write a summary on any book related to environmental issues.

UNIT III Community Service

Activities:

i Conducting One Day Special Camp in a village contacting village-area leaders- Survey in the village, identification of problems- helping them to solve via media- authorities-experts-etc.

i Conducting awareness programs on Health-related issues such as General Health, Mental health, Spiritual Health, HIV/AIDS,

ii Conducting consumer Awareness. Explaining various legal provisions etc.

iii Women Empowerment Programmes- Sexual Abuse, Adolescent Health and Population Education.

iv Any other programmes in collaboration with local charities, NGOs etc.

Reference Books:

1. Nirmalya Kumar Sinha & Surajit Majumder, *A Text Book of National Service Scheme* Vol;.I, Vidya Kutir Publication, 2021 (ISBN 978-81-952368-8-6)

2. *Red Book - National Cadet Corps* – Standing Instructions Vol I & II, Directorate General of NCC, Ministry of Defence, New Delhi

3. Davis M. L. and Cornwell D. A., "Introduction to Environmental Engineering", McGraw Hill, New York 4/e 2008

4. Masters G. M., Joseph K. and Nagendran R. "Introduction to Environmental Engineering and Science", Pearson Education, New Delhi. 2/e 2007

5. Ram Ahuja. *Social Problems in India*, Rawat Publications, New Delhi.

General Guidelines:

1. Institutes must assign slots in the Timetable for the activities.
2. Institutes are required to provide instructor to mentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totalling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.

Regulation
DIET23

Course Code
Name of the Course: Communicative English

Year & Semester: I- II

Course Category:	BS/ES/PC/PE/OE/MC/SC	Credits : 2			
Course Type:	Theory / Tutorial /Practical	Lecture-Tutorial-Practice:	2	0	0
Prerequisites	Basic reading skills	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information	Affective
CO2	Apply grammar rules to form sentences effectively	Affective
CO3	Use correct word forms to communicate effectively with enriching vocabulary	Affective
CO4	Recognize the theme of the given text and summarize and interpret the information	Affective
CO5	Report the information effectively in different formats using good writability	Affective

Note: K-Level is defined From Blooms Taxonomy.

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1								3	3	3				3
CO2								3	3	3				3
CO3								3	3	3				3
CO4								3	3	3				3
CO5								3	3	3				3

COURSE CONTENT:

UNIT I
Lesson: HUMAN VALUES: Gift of Magi (Short Story)
Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions.
Speaking: Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others.
Reading: Skimming to get the main idea of a text; scanning to look for specific pieces of information.
Writing: Mechanics of Writing-Capitalization, Spellings, Punctuation-Parts of Sentences.
Grammar: Parts of Speech, Basic Sentence Structures-forming questions Vocabulary: Synonyms, Antonyms, Affixes (Prefixes/Suffixes), Root words.

UNIT II

Lesson: NATURE: The Brook by Alfred Tennyson (Poem)

Listening: Answering a series of questions about main ideas and supporting ideas after listening to audio texts.

Speaking: Discussion in pairs/small groups on specific topics followed by short structure talks. Reading: Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in a paragraph together.

Writing: Structure of a paragraph - Paragraph writing (specific topics)

Grammar: Cohesive devices - linkers, use of articles and zero article; prepositions.

Vocabulary: Homonyms, Homophones, Homographs.

UNIT III

Lesson: BIOGRAPHY: Elon Musk

Listening: Listening for global comprehension and summarizing what is listened to.

Speaking: Discussing specific topics in pairs or small groups and reporting what is discussed Reading: Reading a text in detail by making basic inferences -recognizing and interpreting specific context clues; strategies to use text clues for comprehension.

Writing: Summarizing, Note-making, paraphrasing

Grammar: Verbs - tenses; subject-verb agreement; Compound words, Collocations

Vocabulary: Compound words, Collocations

UNIT IV

Lesson: INSPIRATION: The Toys of Peace by Saki

Listening: Making predictions while listening to conversations/ transactional dialogues without video; listening with video.

Speaking: Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions.

Reading: Studying the use of graphic elements in texts to convey information, reveal trends/patterns/relationships, communicate processes or display complicated data.

Writing: Letter Writing: Official Letters, Resumes

Grammar: Reporting verbs, Direct & Indirect speech, Active & Passive Voice

Vocabulary: Words often confused, Jargons

UNIT V

Lesson: MOTIVATION: The Power of Intrapersonal Communication (An Essay)

Listening: Identifying key terms, understanding concepts and answering a series of relevant questions that test comprehension.

Speaking: Formal oral presentations on topics from academic contexts

Reading: Reading comprehension. Writing: Writing structured essays on specific topics.

Grammar: Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement)

Vocabulary: Technical Jargons

Textbooks: 1. Pathfinder: Communicative English for Undergraduate Students, 1 st Edition, Orient Black Swan, 2023 (Units 1,2 & 3)

2. Empowering with Language by Cengage Publications, 2023 (Units 4 & 5)

Reference Books:

1. Dubey, Sham Ji & Co. English for Engineers, Vikas Publishers, 2020

2. Bailey, Stephen. Academic writing: A Handbook for International Students. Routledge, 2014.

3. Murphy, Raymond. English Grammar in Use, Fourth Edition, Cambridge University

Press, 2019
4.Lewis, Norman. Word Power Made Easy- The Complete Handbook for Building a Superior Vocabulary. Anchor, 2014.

Web Resources:

GRAMMAR:
1. www.bbc.co.uk/learningenglish
2. https://dictionary.cambridge.org/grammar/british-grammar/
3. www.eslpod.com/index.html
4. https://www.learngrammar.net/
5. https://english4today.com/english-grammar-online-with-quizzes/
6. https://www.talkenglish.com/grammar/grammar.aspx

VOCABULARY
1. https://www.youtube.com/c/DailyVideoVocabulary/videos
2. https://www.youtube.com/channel/UC4cmBAit8i_NJZE8qK8sfpA

Regulation
DIET23

Course Code:

Name of the Course: Chemistry

Year & Semester: I- II

Course Category:	BS/ES/PC/PE/OE/MC/SC	Credits : 3			
Course Type:	**Theory** / Tutorial /Practical	Lecture-Tutorial-Practice:	3	0	0
Prerequisites	Basic concepts of chemistry	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Illustrate Schrodinger wave equation to particle in a box and the molecular orbital energy level diagram of different molecular species	Applying
CO2	Explicate characteristics, preparation methods and applications of advanced materials (Semiconductors, Super conductors, supercapacitors and nano materials)	Applying
CO3	Describe the titrations, electrochemical sensors, construction of cells and emf of cell	Applying
CO4	Elucidate polymerization techniques and identify suitable polymer material for a given engineering application.	Applying
CO5	Acquaint about principles, applications of analytical techniques(spectroscopy and chromatography)	Applying

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3													
CO2	3													
CO3	3													
CO4	3													
CO5	3													

COURSE CONTENT:

UNIT-1: Structure and Bonding Models:

Fundamentals of Quantum mechanics, Schrodinger Wave equation, significance of Ψ and Ψ2, particle in one dimensional box, molecular orbital theory – bonding in homo- and heteronuclear diatomic molecules – energy level diagrams of O2 and CO, etc. π-molecular orbitals of butadiene and benzene, calculation of bond order.

UNIT-2: Modern Engineering materials

Semiconductors – Introduction, basic concept, application

Super conductors-Introduction basic concept, applications.

Supercapacitors: Introduction, Basic Concept-Classification – Applications.

Nano materials: Introduction, classification, properties and applications of Fullerenes, carbon nano tubes and Graphines nanoparticles

UNIT-3: Electrochemistry and Applications

Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, potentiometry-potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations).

Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples.

Primary cells – Zinc-air battery, Secondary cells –lithium-ion batteries- working of the batteries including cell reactions; Fuel cells, hydrogen-oxygenfuel cell– working of the cells. Polymer Electrolyte Membrane Fuel cells (PEMFC).

UNIT-4: Polymer Chemistry

Introduction to polymers, functionality of monomers, chain growth and step growth polymerization, coordination polymerization, with specific examples and mechanisms of polymer formation.

Plastics –Thermo and Thermosetting plastics, Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres.

Elastomers–Buna-S, Buna-N–preparation, properties and applications.

Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications.

Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA).

UNIT-5: Instrumental Methods and Applications

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. UV-Visible Spectroscopy, electronic transition, Instrumentation, IR spectroscopies, fundamental modes and selection rules, Instrumentation. Chromatography-Basic Principle, Classification-HPLC: Principle, Instrumentation and Applications.

TEXT BOOKS:

1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.

2.Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

REFERENCE BOOKS:

1.Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.

2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008

3. Textbook of Polymer Science, Fred W. Billmayer Jr, 3rd Edition

E-RESOURCES/DIGITAL MATERIAL:

(a) https://moodle.net

(b) https://libguides.reading.ac.uk/chemistry/e-resources

Regulation
DIET23

Course Code:

Name of the Course: **Differential Equations and Vector Calculus**

Year & Semester: I- II

Course Category:	BS	Credits: 3			
Course Type:	Theory / Tutorial	Lecture-Tutorial-Practice:	3	0	0
Prerequisites	Basics of Differentiation and Integration & Vector Algebra	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Solve differential equations of first order and first degree and apply to various engineering fields.	3-Applying
CO2	Solve linear differential equations of higher order with constant coefficients and apply to various engineering fields.	3-Applying
CO3	Solve linear partial differential equations.	3-Applying
CO4	Find gradient, divergence and curl of point functions and apply gradient to find directional derivative.	3-Applying
CO5	Apply vector integral theorems to find work done and flux.	3-Applying

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO2	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO3	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO4	3	3	-	-	-	-	-	-	-	-	-	3	3	3
CO5	3	3	-	-	-	-	-	-	-	-	-	3	3	3

COURSE CONTENT:

UNIT-1: Differential equations of first order and first degree

Linear differential equations – Bernoulli's equations- Exact equations and equations reducibleto exact form. Applications: Newton's Law of cooling – Law of natural growth and decay- Electrical circuits.

UNIT-2: Linear differential equations of higher order (Constant coefficients)
Definitions, homogenous and non-homogenous, complimentary function, general solution, particular integral, Wronskian, Method of variation of parameters. Simultaneous linear equations, Applications to L-C-R Circuit problems and Simple Harmonic motion.

UNIT-3: Partial differential equations

Introduction and formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order linear equations using Lagrange's method. Homogeneous Linear Partial differential equations with constant coefficients.

UNIT-4: Vector differentiation

Scalar and vector point functions, vector operator Del, Del applies to scalar point functions- Gradient, Directional derivative, del applied to vector point functions-Divergence and Curl, vector identities.

UNIT-5: Vector integration

Line integral-circulation-work done, surface integral-flux, Green's theorem in the plane(without proof), Stoke's theorem (without proof), volume integral, Divergence theorem (without proof) and related problems.

TEXT BOOKS:

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

REFERENCE BOOKS:

(vii) Engineering Mathematics-II (Differential Equations and Vector Calculus) by T.K.V. Iyengar et.al., S Chand and Company Ltd.
(viii) Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, PearsonPublishers, 2018, 14th Edition.
(ix) Advanced Engineering Mathematics, Dennis G. Zill and Warren S. Wright, Jones andBartlett, 2018.
(x) Advanced Modern Engineering Mathematics, Glyn James, Pearson publishers, 2018, 5th Edition.
(xi) Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Alpha Science International Ltd., 2021 5th Edition (9th reprint).
(xii) Higher Engineering Mathematics, B. V. Ramana, McGraw Hill Education, 2017.

E-RESOURCES/DIGITAL MATERIAL:

(a) http://www.nptelvideos.com/mathematics/
(b) https://www.digimat.in/111.html

Regulation
DIET23

BASIC CIVIL & MECHANICAL ENGINEERING

Year & Semester: I- II

Course Category:	**Engineering Science (ES)**	Credits : 3			
Course Type:	**Theory**	Lecture-Tutorial-Practice:	3	0	0
Prerequisites	-	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Understand various sub-divisions of Civil Engineering and attain knowledge on prefabricated technology to appreciate their role in ensuring better society.	K-2
CO2	Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying.	K-2
CO3	Realize the importance of Transportation in nation's economy and importance of Water Storage through conveyance structures so that the social responsibilities of water conservation will be appreciated.	K-2
CO4	Identify the scope and importance of Mechanical Engineering in different sectors and industries	K-2
CO5	Understand the different manufacturing processes and explain the basics of thermal engineering and its applications	K-2
CO6	Describe the working of different mechanical power transmission systems and power plants and basics of robotics and its applications.	K-2

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2	3	3	0	0	0	0	0	0	0	0	0	0	2	2
CO3	3	0	0	0	0	0	0	0	0	0	0	0	2	2
CO4	3	2	0	0	0	0	0	0	0	0	0	2	3	2
CO5	3	2	0	0	0	0	0	0	0	0	0	2	3	2
CO5	3	2	0	0	0	0	0	0	0	0	0	2	3	2

COURSE CONTENT:

UNIT-1:

Basics of Civil Engineering: Role of Civil Engineers in Society- Various Disciplines of Civil Engineering- Structural Engineering- Geo-technical Engineering- Transportation Engineering - Hydraulics and Water

Resources Engineering - Environmental Engineering-Scope of each discipline - Building Construction and Planning- Construction Materials-Cement - Aggregate - Bricks- Cement concrete- Steel. Introduction to Prefabricated construction techniques.

UNIT-2:

Surveying: Objectives of Surveying- Horizontal Measurements- Angular Measurements- Introduction to Bearings Levelling instruments used for levelling -Simple problems on levelling and bearings-Contour mapping.

UNIT-3:

Transportation Engineering Importance of Transportation in Nation's economic development- Types of Highway Pavements- Flexible Pavements and Rigid Pavements - Simple Differences. Basics of Harbour, Tunnel, Airport, and Railway Engineering.

Water Resources and Environmental Engineering: Introduction, Sources of water- Quality of water- Specifications- Introduction to Hydrology–Rainwater Harvesting-Water Storage and Conveyance Structures (Simple introduction to Dams and Reservoirs).

UNIT IV

Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society- Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors.

Engineering Materials - Metals-Ferrous and Non-ferrous, Ceramics, Composites, Smart materials.

UNIT V

Manufacturing Processes: Principles of Casting**,** Forming, joining processes, Machining, Introduction to CNC machines, 3D printing, and Smart manufacturing.

Thermal Engineering – Working principle of Boilers, Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles, IC engines, 2-Stroke and 4-Stroke engines, SI/CI Engines, Components of Electric and Hybrid Vehicles.

UNIT VI

Power plants – Working principle of Steam, Diesel, Hydro, Nuclear power plants.

Mechanical Power Transmission - Belt Drives, Chain, Rope drives, Gear Drives and their applications.

Introduction to Robotics - Joints & links, configurations, and applications of robotics.

(Note: The subject covers only the basic principles of Civil and Mechanical Engineering systems. The evaluation shall be intended to test only the fundamentals of the subject.)

TEXT BOOKS:

[1]. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.

[2]. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers. 2022. First Edition.

[3]. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

[4]. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.

[5]. A text book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.

[6]. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

REFERENCE BOOKS:

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.
6. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.
7. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.
8. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications
9. AppuuKuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

E-RESOURCES/DIGITAL MATERIAL:

a) https://archive.nptel.ac.in/courses/105/106/105106201/
b) https://onlinecourses.nptel.ac.in/noc23_ce80/preview

Regulation **DIET23**	Course Code	

DATA STRUCTURES

Year & Semester: I- II

Course Category:	**Professional Core (PC)**	Credits: 3			
Course Type:	**Theory**	Lecture-Tutorial-Practice:	3	0	0
Prerequisites		Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Explain the role of linear data structures in organizing and accessing data efficiently in algorithms.	2
CO2	Apply linked lists for dynamic data storage, demonstrating understanding of memory allocation	3
CO3	Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.	3
CO4	Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and apply them appropriately to solve data management challenges	3
CO5	Develop novel solutions to small scale programming challenges involving data structures such as Trees. Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.	3

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1-** Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	-	-	2	2	-	-	-	-	-	-	-	-	2	2
CO2	-	-	3	3	-	-	-	-	-	-	-	-	3	3
CO3	-	-	3	3	-	-	-	-	-	-	-	-	3	3
CO4	-	-	3	3	-	-	-	-	-	-	-	-	3	3
CO5	-	-	3	3	-	-	-	-	-	-	-	-	3	3

COURSE CONTENT:

UNIT-1:

Introduction to Linear Data Structures: Definition and importance of linear data structures, Abstract data types (ADTs) and their implementation, Overview of time and space complexity analysis for linear data structures. Searching Techniques: Linear & Binary Search, Sorting Techniques: Bubble sort, Selection sort, Insertion Sort.

UNIT-2:

Linked Lists: Singly linked lists: representation and operations, doubly inked lists and circular linked lists, Comparing arrays and linked lists, Applications of linked lists – Polynomial addition, multiplication, Sparse Matrix

UNIT-3:

Stacks: Introduction to stacks: properties and operations, implementing stacks using arrays and linked lists, Applications of stacks in expression evaluation, backtracking, reversing list etc.

UNIT-4:

Queues: Introduction to queues: properties and operations, implementing queues using arrays and linked lists, Circular Queues, Applications of Queue – FCFS Scheduling, etc.

Deques: Introduction to deques (double-ended queues), Operations on deques and their applications

UNIT-5:

Trees: Introduction to Trees, Binary Search Tree–Insertion, Deletion & Traversal, Heap Tree, Heap Sort

Graphs: Introduction to Graphs, Graph Terminology, Graph Representation, Adjacency Matrix, linked list Representation**.**

Hashing: Brief introduction to hashing and hash functions, Collision resolution techniques: chaining and open addressing, Hash tables: basic implementation and operations, Applications of hashing in unique identifier generation, caching, etc

TEXT BOOKS:

[1] Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.

[2] Fundamentals of data structures in C, Ellis Horowitz, Sartaj Shane, Susan Anderson-Freed, Silicon Press, 2008

REFERENCE BOOKS:

(i) Algorithms and Data Structures: The Basic Tool box by Kurt Mehl horn and Peter Sanders

(ii) C Data Structures and Algorithms by Alfred V.Aho, Jeffrey D.Ullman, and John E.Hopcroft

(iii)Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum

(iv)Introduction to Algorithms by Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivets, and Clifford Stein

(v) Algorithms in C, Parts 15 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgwick

Regulation
DIET23

Course Code:
Name of the Course: Comunicative English Lab

Year & Semester: I- II

Course Category:	BS/ES/PC/PE/OE/MC/SC	Credits : 1			
Course Type:	Theory / Tutorial /Practical	Lecture-Tutorial-Practice:	0	0	2
Prerequisites	Basic understanding of LSRW Skills	Continuous Evaluation	30		
		Semester End Evaluation	70		
		Total Marks	100		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Identify and pronounce consonants and vowel sounds as per the International Phonetic Alphabet	Cognitive
CO2	Speak fluently by practising accent, rhythm and intonation	Affective
CO3	Interact with others confidently on phone or in person by using appropriate expressions	Psycho motor
CO4	Make oral presentations on different topics - individually or in groups with confidence, clarity and conviction	Psycho motor

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1								3	3	3				3
CO2								3	3	3				3
CO3								3	3	3				3
CO4								3	3	3				3

COURSE CONTENT:

1Vowels & Consonants
2. Neutralization/Accent Rules
3. Communication Skills & JAM
4. Role Play or Conversational Practice
5. E-mail Writing
6. Resume Writing, Cover letter, SOP
7. Group Discussions-methods & practice
8. Debates - Methods & Practice
9. PPT Presentations/ Poster Presentation
10. Interviews Skills

Suggested Software: • Walden Infotec
• Young India Films

Reference Books: 1. Raman Meenakshi, Sangeeta-Sharma. Technical Communication.

Oxford Press.2018.
2. Taylor Grant: English Conversation Practice, Tata McGraw-Hill Education India, 2016
3. Hewing's, Martin. Cambridge Academic English (B2). CUP, 2012.
4. J. Sethi & P.V. Dhamija. A Course in Phonetics and Spoken English, (2nd Ed), Kindle, 2013

Web Resources: Spoken English:

1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net
4. https://www.britishcouncil.in/english/online
5. http://www.letstalkpodcast.com/
6. https://www.youtube.com/c/mmmEnglish_Emma/featured
7. https://www.youtube.com/c/ArnelsEverydayEnglish/featured
8. https://www.youtube.com/c/engvidAdam/featured
9. https://www.youtube.com/c/EnglishClass101/featured
1. https://www.youtube.com/c/SpeakEnglishWithTiffani/playlists
11. https://www.youtube.com/channel/UCV1h_cBE0Drdx19qkTM0WNw

Voice & Accent:

1https://www.youtube.com/user/letstalkaccent/videos .
2https://www.youtube.com/c/EngLanguageClub/featured
3.https://www.youtube.com/channel/UC_OskgZBoS4dAnVUgJVexc
4.https://www.youtube.com/channel/UCNfm92h83W2i2ijc5Xwp_IA

Regulation
DIET23

Code

Name of the Course CHEMISTRY LAB

Year & Semester: I- II

CourseCategory:	BS/ES/PC/PE/OE/MC/SC	Credits :1.5			
Course Type:	Theory / Tutorial /Practical	Lecture-Tutorial-Practice:	0	0	3
Prerequisites	Basic concepts of chemistry	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course,the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Handle Conductivity meter, Colorimeter, Potentiometer and different types of spectrophotometers for analysis of materials using small quantities involved for quick and accurate results.	Applying
CO2	Carry out acid- base and redox titrations for estimation of acid and iron.	Applying
CO3	Prepare advanced materials like Bakelite, nano materials	Applying

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate,**3** – High)

CO No.	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3								3					
CO2	3								3					
CO3	3								3					
CO4	3								3					
CO5	3								3					

COURSE CONTENT:

Introduction to Chemistry laboratory – Molarity, normality, primary, secondary standard solutions, volumetric titrations, quantitative analysis

1. Determination of HCl using standard Na_2CO_3solution.
2. Determination of alkalinity of a sample containing Na_2CO_3andNaOH.
3. Determination of Mn (II) using standard oxalic acidsolution.
4. Determination of ferrous iron using standard $K_2Cr_2O_7$solution.
5. Determination of temporary and permanent hardness of water using standard EDTA solution.

6. Determination of iron (III) by a colorimetricmethod.
7. Determination of the concentration of acetic acid using sodium hydroxide (pH-metry method).
8. Determination of the concentration of strong acid vs strong base (by Conductometric method).
9. Determination of strong acid vs strong base (by Potentiometricmethod).
10. Estimation of VitaminC.
11. Determination of concentration of acid content in softdrinks using pH meter.
12. Preparation of Bakelite (demonstrationonly).

Of the above experiments at-least 10 assessment experiments should be completed in a semester.

TEXT BOOKS:

[1]A Textbook of Quantitative Analysis, Arthur J. Vogel.

Regulation
DIET23

Course Code
ENGINEERING WORKSHOP

Year & Semester: I- II

CourseCategory:	**Engineering Science (ES)**	Credits: 1.5			
Course Type:	**Practical**	Lecture-Tutorial-Practice:	0	0	3
Prerequisites	Practical	Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	Course Outcome Description	K - Level
CO1	Perform operations in carpentry, fitting, plumbing with appropriate tools	3
CO2	Develop prototypes with sheet metals	3
CO3	Perform electrical connections required for house wiring	3
CO4	design the patterns and core boxes for metal casting processes	3
CO5	Understand Arc Welding and Gas welding equipment for the fabrication of welded joints	3

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate,**3** – High)

CO No.	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	-	-	-	-	-	3	3	2	-	2	3	2	-
CO2	3	2	-	-	-	-	-	3	3	2	-	2	3	2	-
CO3	3	2	-	-	-	-	-	3	3	2	-	2	3	2	-
CO4	3	2	-	-	-	-	-	3	3	2	-	2	3	2	-
CO5	3	2	-	-	-	-	-	3	3	2	-	2	3	2	-

COURSE CONTENT:

1 **Demonstration**: Safety practices and precautions to be observed in workshop.

2 **Wood Working:** Familiarity with different types of woods and tools used in wood working and make following joints.

a) Half – Lap joint b) Mortise and Tenon joint c) Corner Dovetail joint or Bridle joint

3 **Sheet Metal Working**: Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal job from GI sheets.

a) Tapered tray b) Conical funnel c) Elbow pipe d) Brazing

4 **Fitting:** Familiarity with different types of tools used in fitting and do the following fitting exercises.

a) V-fit b) Dovetail fit c) Semi-circular fit d) Bicycle tire puncture and change of two-wheeler tyre

5 **Electrical Wiring**: Familiarity with different types of basic electrical circuits and make the following connections.

a) Parallel and series b) Two-way switch c) Godown lighting

d) Tube light e) Three phase motor f) Soldering of wires

6 **Foundry Trade:** Demonstration and practice on Moulding tools and processes, Preparation of Green Sand Moulds for given Patterns.

7 **Welding Shop**: Demonstration and practice on Arc Welding and Gas welding. Preparation of Lap joint and Butt joint.

8 **Plumbing:** Demonstration and practice of Plumbing tools, Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters.

9 **Basic repairs of Two-wheeler vehicle** – Demonstration of working of two-wheeler vehicle and its repairs.

Textbooks:

[1]. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.

[2]. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22.

E-Resources:

1. https://archive.nptel.ac.in/courses/112/107/112107219/

Regulation
DIET23

Course Code
DATA STUCTURES LAB

Year & Semester: I- II

Course Category:	**Professional Core (PC)**	Credits: 1.5			
Course Type:	**Practical**	Lecture-Tutorial-Practice:	0	0	3
Prerequisites		Continuous Evaluation	30M		
		Semester End Evaluation	70M		
		Total Marks	100M		

Course Outcomes:

After Successful Completion of course, the student will be able to:		
CO No:	**Course Outcome Description**	**K - Level**
CO1	Explain the role of linear data structures in organizing and accessing data efficiently in algorithms.	**2**
CO2	Implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation.	**3**
CO3	Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.	**3**
CO4	Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues and apply them appropriately to solve data management challenges.	**3**
CO5	Develop scenarios where hashing is advantageous, and design hash-based solutions for specific problems.	**3**

Note: K-Level is defined From Blooms Taxonomy

Contribution of Course Outcomes mapping with POs & PSOs (**1**- Low, **2** – Moderate, **3** – High)

CO No.	**PO 1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	-	-	3	3	-	-	-	-	-	-	-	-	3	3
CO2	-	-	3	3	-	-	-	-	-	-	-	-	3	3
CO3	-	-	3	3	-	-	-	-	-	-	-	-	3	3
CO4	-	-	3	3	-	-	-	-	-	-	-	-	3	3
CO5	-	-	3	3	-	-	-	-	-	-	-	-	3	3

COURSE CONTENT:

List of Experiments:

Exercise1: Array Manipulation

i) Write a program to reverse an array.
ii) C Programs to implement the Searching Techniques– Linear & Binary Search
iii) C Programs to implement Sorting Techniques–Bubble, Selection, Insertion, Quick, Merge Sort

Exercise2: Linked List Implementation

i) Implement a singly linked list and perform insertion and deletion operations.

ii) Develop a program to reverse a linked list iteratively and recursively.

Exercise3: Linked List Applications

i) Create a program to detect and remove duplicates from a linked list.
ii) Implement a linked list to represent polynomials and perform addition.
iii) Implement a double-ended queue (Deque) with essential operations.

Exercise4: Double Linked List Implementation

i) Implement a doubly linked list and perform various operations to understand its properties and applications.
ii) Implement a circular linked list and perform insertion, deletion, and traversal

Exercise5: Stack Operations

i) Implement a stack using arrays and linked lists.
ii) Write a program to evaluate a postfix expression using a stack.
iii) Implement a program to check for balanced parentheses using a stack.

Exercise6: Queue Operations

i) Implement a queue using arrays and linked lists.
ii) Solve problems involving circular queues.

Exercise7: Stack and Queue Applications

i) Use a stack to evaluate an infix expression and convert it to postfix.
ii) Create a program to determine whether a given string is a palindrome or not.

Exercise8: Binary Search Tree

i) Implementing a BST using Linked List.
ii) Traversing of BST.

Exercise9: Hashing

i) Implement a hash table with collision resolution techniques.
ii) Write a program to implement a simple cache using hashing.

TEXT BOOKS:

[1] Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
[2] Fundamentals of data structures in C, Ellis Horowitz, Sartaj Shane, Susan Anderson-Freed, Silicon Press, 2008

REFERENCE BOOKS:

(i)Algorithms and Data Structures: The Basic Tool box by Kurt Mehlhorn and Peter Sanders
(ii) C Data Structures and Algorithms by Alfred V.Aho, Jeffrey D.Ullman, and John E.Hopcroft
(iii) Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
(iv)Introduction to Algorithms by Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, and Clifford Stein
(V) Algorithms in C, Parts15 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgwick

Regulation **DIET23**	Course Code **HEALTH AND WELLNESS, YOGA AND SPORTS**

Year & Semester: I- II

Course Category:		Credits : 0.5			
Course Type:	**Practical**	Lecture-Tutorial-Practice:	0	0	1
Prerequisites		Continuous Evaluation			
		Semester End Evaluation			
		Total Marks	100M		

Course Objectives:
The main objective of introducing this course is to make the students maintain their mental and physical wellness by balancing emotions in their life. It mainly enhances the essential traits required for the development of the personality.

Course Outcomes: After completion of the course the student will be able to

CO1: Understand the importance of yoga and sports for Physical fitness and sound health.

CO2: Demonstrate an understanding of health-related fitness components.

CO3: Compare and contrast various activities that help enhance their health.

CO4: Assess current personal fitness levels.

CO5: Develop Positive Personality

UNIT I

Concept of health and fitness, Nutrition and Balanced diet, basic concept of immunity Relationship between diet and fitness, Globalization and its impact on health, Body Mass Index (BMI) of all age groups.

Activities:

i Organizing health awareness programmes in community

ii Preparation of health profile

iii Preparation of chart for balance diet for all age groups

UNIT II

Concept of yoga, need for and importance of yoga, origin and history of yoga in Indian context, classification of yoga, Physiological effects of Asanas- Pranayama and meditation, stress management and yoga, Mental health and yoga practice.

Activities:

Yoga practices – Asana, Kriya, Mudra, Bandha, Dhyana, Surya Namaskar

UNIT III

Concept of Sports and fitness, importance, fitness components, history of sports, Ancient and Modern Olympics, Asian games and Commonwealth games.

Activities:

i Participation in one major game and one individual sport viz., Athletics, Volleyball, Basketball, Handball, Football, Badminton, Kabaddi, Kho-kho, Table tennis, Cricket etc. Practicing general and specific warm up, aerobics

ii Practicing cardiorespiratory fitness, treadmill, run test, 9 min walk, skipping and running.

Reference Books:

1. Gordon Edlin, Eric Golanty. Health and Wellness, 14th Edn. Jones & Bartlett Learning, 2022
2. T.K.V.Desikachar. The Heart of Yoga: Developing a Personal Practice
3. Archie J.Bahm. Yoga Sutras of Patanjali, Jain Publishing Company, 1993
4. Wiseman, John Lofty, SAS Survival Handbook: The Ultimate Guide to Surviving Anywhere Third Edition, William Morrow Paperbacks, 2014
5. The Sports Rules Book/ Human Kinetics with Thomas Hanlon. -- 3rd ed. Human Kinetics, Inc.2014

General Guidelines:

1. Institutes must assign slots in the Timetable for the activities of Health/Sports/Yoga.
2. Institutes must provide field/facility and offer the minimum of five choices of as many as Games/Sports.
3. Institutes are required to provide sports instructor / yoga teacher to mentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totalling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.