TECHNO INDIA UNIVERSITY

WEST BENGAL

Syllabus

for

4-Years B.Tech.

in

Computer Science and Engineering
(Specialization in Artificial Intelligence)

Academic Year: 2024-2025

Semester 1

Career Advancement & Skill Development -I Communication Skill (TIU-HSM-UEN-S11191)

Program: B. Tech. in CSE-AI	**Year, Semester:** 1st Yr., 1st Sem.
Course Title: Career Advancement & Skill Development - I Communication Skill	**Subject Code:** TIU-HSM-UEN-S11191
Contact Hours/Week: 2-0-0 (L-T-P)	**Credit: 2**

COURSE OBJECTIVE:

Enable the student to:

1. Develop English proficiency for clear, precise, and confident workplace communication.
2. Enhance practical skills in vocabulary, grammar, pronunciation, speaking, and writing.
3. Apply communication theories to improve professional and interpersonal interactions.

COURSE OUTCOME :

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

CO-1:	Explain fundamental communication principles and their relevance in workplace interactions.	K2
CO-2:	Apply grammar and language skills to construct precise and coherent spoken and written communication.	K3
CO-3:	Demonstrate fluency in spoken English through pronunciation drills, vocabulary building, and interactive conversations.	K4
CO-4:	Construct well-organized sentences, paragraphs, and linked paragraphs to enhance professional writing	K3
CO-5:	Develop and revise written communication by employing strategies for drafting, editing, and proofreading.	K3
CO-6:	Assess and refine communication skills to ensure clarity, precision, and confidence in workplace interactions.	K4

COURSE CONTENT:

MODULE 1:	**INTRODUCTION TO COMMUNICATION**	**7 Hours**
Definition of Communication, Importance of Communication in the Workplace, Introduction to Communication Theory, Elements of Effective Communication, Barriers to Communication, Verbal and Non-Verbal Communication, Role of Culture in Communication.		
MODULE 2:	**LANGUAGE AND GRAMMAR SKILLS**	**5 Hours**

Fundamentals of English Grammar, Sentence Structure and Syntax, Parts of Speech, Tenses and their Usage, Common Errors in Grammar, Punctuation and Mechanics, Effective Use of Vocabulary, Word Formation and Usage, Formal vs. Informal Language.		
MODULE 3:	**SPEAKING SKILLS**	**8 Hours**
Principles of Effective Speaking, Pronunciation Drills, Sounds of English: Vowels and Consonants, Stress and Intonation, Developing Conversational Skills, Speaking with Clarity and Confidence, Public Speaking Basics, Expressing Opinions and Arguments, Active Listening and Response.		
MODULE 4:	**WRITING SKILLS**	**8 Hours**
The Writing Process: Planning, Drafting, Revising, Editing, Writing Effective Sentences and Paragraphs, Paragraph Development and Coherence, Formal and Informal Writing Styles, Writing Emails and Workplace Documents, Writing Reports and Memos, Common Writing Errors and How to Avoid Them		
MODULE 5:	**PRACTICAL LANGUAGE APPLICATION**	**5 Hours**
Building Vocabulary through Context, Word Choice and Precision, Constructing Grammatically Correct Sentences, Exercises in Sentence Formation, Pronunciation Drills and Accent Neutralization, Role-Plays and Dialogues, Group Discussions and Debates, Writing and Structuring Paragraphs, Linking Paragraphs for Coherent Writing.		
MODULE 6:	**PROFESSIONAL COMMUNICATION IN THE WORKPLACE**	**4 Hours**
Workplace Communication Etiquette, Business Correspondence, Writing Professional Emails, Preparing Presentations, Communicating in Meetings, Handling Workplace Conversations, Persuasive and Negotiation Skills, Overcoming Communication Barriers, Strategies for Effective Workplace Communication.		
TOTAL LECTURES		**30 Hours**

Books:

1. Sanjay Kumar, Pushp Lata, “Communication Skills”, Oxford University Press, 2015, ISBN: 9780199457069
2. M Ashraf Rizvi, “Effective Technical Communication”, McGraw Hill Education, 2017, ISBN9352606108
3. Steven A. Beebe, Susan J. Beebe, and Mark V. Redmond, “Interpersonal Communication: Relating to Others”, Pearson, 2013, ISBN-10: 020586273X, ISBN-13: 978-0205862733.
4. Judee K. Burgoon, Laura K. Guerrero, and Kory Floyd, “Nonverbal Communication”, Routledge, 2016, ISBN-10: 1138121348, ISBN-13: 978-1138121346.
5. Ronald B. Adler, Lawrence B. Rosenfeld, and Russell F. Proctor II, “Interplay: The Process of Interpersonal Communication”, Oxford University Press, 2017, ISBN-10: 019064625X, ISBN-13: 978-0190646257.
6. Joseph A. DeVito, “The Interpersonal Communication Book”, Pearson, 2015, ISBN-10: 0133753816, ISBN-13: 978-0133753813.
7. Sarah Trenholm and Arthur Jensen, “Interpersonal Communication”, Oxford University Press, 2013, ISBN-10: 0199827504, ISBN-13: 978-0199827503.

8. John Stewart, "Bridges Not Walls: A Book About Interpersonal Communication", McGraw-Hill Education, 2011, ISBN-10: 0073534315, ISBN-13: 978-0073534312.
9. Pamela J. Kalbfleisch, "Interpersonal Communication: Evolving Interpersonal Relationships", Routledge, 2013, ISBN-10: 0805816611, ISBN-13: 978-0805816619.
10. Mark L. Knapp, John A. Daly, and Frederick P. M. Boster, "Interpersonal Communication Handbook", Sage Publications, 2011, ISBN-10: 1412974747, ISBN-13: 978-1412974745

Mathematics-I (TIU-BS-UMA-T11101)

Program: B. Tech. in CSE-AI	**Year, Semester:** 1st Yr., 1st Sem.
Course Title: Mathematics-I	**Subject Code:**TIU-BS-UMA-T11101
Contact Hours/Week: 3-1-0 (L-T-P)	**Credit:** 4

COURSE OBJECTIVE:

Enable the student to:

1. Analyze and describe the behavior of functions of single and multiple variable, understand sequences and series.
2. Solve systems of linear equations, evaluate eigen values and eigenvectors of square matrices.
3. Analyzing differential equations and finding their solutions.

COURSE OUTCOME:

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

CO-1:	Analyze the behavior and the nature of the curve with calculus of one variable.	K4
CO-2:	Develop a basic understanding of functions of several variables and their properties.	K4
CO-3:	Investigate the solutions of systems of linear equations using Determinants and Matrices.	K4
CO-4:	Evaluate Eigenvalue and vectors of square matrices.	K4
CO-5:	Examine the nature (viz., convergence, divergence) of sequence and series.	K4
CO-6:	Analyze differential equations and investigate solutions.	K4

COURSE CONTENT:

MODULE 1:	**Differential Calculus**	**12 Hours**
Differential Calculus (Functions of one variable): Rolle's theorem (statement only), Cauchy's mean value theorem (Lagrange's mean value theorem as a special case), Taylor's and Maclaurin's theorems with remainders, indeterminate forms, concavity and convexity of a curve, points of inflexion, asymptotes and curvature. Differential Calculus (Functions of several variables): Limit, continuity and differentiability of functions of several variables, partial derivatives and their geometrical interpretation,		

differentials, derivatives of composite and implicit functions, derivatives of higher order and their commutatively, Euler's theorem on homogeneous functions, harmonic functions, Taylor's expansion of functions of several variables, maxima and minima of functions of several variables – Lagrange's method of multipliers.		
MODULE 2:	**Ordinary Differential Equations**	**10 Hours**
Ordinary Differential Equations: Formation of differential equation, First order differential equations - exact, linear and Bernoulli s form, second order differential equations with constant coefficients, method of variation of parameters, general linear differential equations with constant coefficients, Euler's equations, system of differential equations.		
MODULE 3:	**Sequences and Series**	**8 Hours**
Sequences and Series: Sequences and their limits, convergence of series, comparison test, Ratio test, Root test, Absolute and conditional convergence, alternating series, Power series.		
MODULE 4:	**Matrix and Determinant**	**15 Hours**
Matrix and Determinant: Revision of matrix and determinant, rank and nullity, solutions of system of linear equations using Determinants and Matrices; Eigenvalues and eigen vectors, Cayley-Hamilton Theorem, transformation of matrices, adjoint of an operator, normal, unitary, hermitian and skew-hermitian operators, quadratic forms.		
TOTAL LECTURES		**45 Hours**

Books:

1. Higher Engineering Mathematics, B. S. Grewal
2. Advanced Engineering Mathematics, Kreyszig
3. A TextBook of Engineering Mathematics, Rajesh Pandey
4. Engineering Mathematics, B. K. Pal, K. Das

Introduction to Programming (TIU-ES-UCS-T11101)

Program: B. Tech. in CSE-AI	**Year, Semester:** 1st Yr., 1st Sem.
Course Title: Introduction to Programming	**Subject Code:**TIU-ES-UCS-T11101
Contact Hours/Week: 3–0–0 (L–T–P)	**Credit:** Theory–3

COURSE OBJECTIVE :

Enable the student to:

1. Develop algorithmic problem-solving skills and implement them in C programs.
2. Apply modular programming, recursion, and data structures to create interactive C programs.
3. Utilize advanced C concepts like structures, pointers, and linked lists for efficient programming.

COURSE OUTCOME :

The student will be able to:

CO1:	Analyze algorithmic solutions to problems.	K4
CO2:	Construct algorithms using C programming.	K3
CO3:	Apply interactive input/output, arithmetic expressions, repetitions, decision-making, and arrays in programs.	K3
CO4:	Organize modular C programs using functions, including recursion.	K3
CO5:	Categorize programs using structures, unions, pointers, and linked lists.	K4
CO6:	Utilize file input and output operations in programs.	K3

COURSE CONTENT :

MODULE 1:	**INTRODUCTION TO C LANGUAGE**	**4 Hours**
Character set, Variables and Identifiers, Built-in Data Types, Variable Definition, Arithmetic operators and Expressions, Constants and Literals, Simple assignment statement, Basic input/output statement, Simple 'C' programs.		
MODULE 2:	**CONDITIONAL STATEMENTS AND LOOPS**	**6 Hours**
Decision making within a program Conditions, Relational Operators, Logical Connectives, if statement, if-else statement. Loops: while loop, do while, for loop, Nested loops, Infinite loops, switch statement, Structured Programming.		
MODULE 3:	**ARRAYS**	**6 Hours**
One dimensional arrays: Array manipulation, Searching, Insertion, and Deletion of an element from an array, finding the largest / smallest element in an array; Two dimensional arrays, Addition/ multiplication of two matrices transpose of a square matrix, Null terminated strings as array of characters, Representation sparse matrice.		
MODULE 4:	**FUNCTIONS**	**7 Hours**
Top-down approach of problem solving; Modular programming and functions; Standard Library of C functions; Prototype of a function Formal parameter list, Return Type, Function call, Block structure; Passing arguments to a Function Call by reference, Call by value, Recursive Functions, Arrays as function arguments.		
MODULE 5:	**STRUCTURES AND UNIONS**	**5 Hours**
Structure variables, Initialization, Structure assignment, Nested structure, Structures and Functions, Structures and arrays: Arrays of structures, Structures containing arrays, Unions.		
MODULE 6:	**POINTERS**	**9 Hours**
Address operators, Pointers type declaration, Pointer assignment, Pointer initialization, Pointer arithmetic, Functions and pointers, Arrays and Pointers, Pointer arrays.		
MODULE 7:	**SELF-REFERENTIAL STRUCTURES AND LINKED LISTS**	**3 Hours**
Creation of a singly connected linked list, traversing a linked list, Insertion into a linked list, Deletion from a linked list.		
MODULE 8:	**FILE PROCESSING**	**5 Hours**

Concept of Files, File opening in various modes and closing of a file, Reading from a file, writing onto a file.	
TOTAL LECTURES	**45 Hours**

Books:

1. B W Kernighan and D.M. Ritchie, The C Programming Language, Prentice Hall of India.
2. K. Venugopal and Sudeep R Prasad, Programming with C, McGraw Hill
3. R G Dromey, How to solve it by Computer, Prentice Hall in India.
4. Jones, Robin and Stewart, The Art of C Programming, Narosa Publishing House
5. A Kenneth, C Problem solving and Programming, Prentice Hall International.
6. H.Scheldt, C: The Complete Reference, 4th Edition, McGraw Hill

Physics (TIU-BS-UPH-T11101)

Program: BTech in CSE-AI	**Year, Semester:** 1st Yr., 1st Sem
Course Title: Physics	**Subject Code:** TIU-BS-UPH-T11101
Contact Hours/Week: 3–1–0 (L–T–P)	**Credit:** 4

COURSE OBJECTIVE:

Enable the student to:

1. Provide a foundational understanding of basic concepts of physics.
2. Develop problem-solving skills and apply the basic concepts of physics in real-world phenomena.
3. Foster critical thinking and analytical skills in applying theoretical knowledge to practical physics problems.

COURSE OUTCOME:

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

CO-1:	Explain and apply the concepts of gradient, divergence, and curl in vector calculus and their applications in mechanics.	K3
CO-2:	Apply the principles of simple harmonic motion, damped and forced oscillations and resonance to real-world acoustical problems.	K3
CO-3:	Describe the principles of interference, diffraction, and polarization, and explain the working of lasers, including population inversion and pumping mechanisms. Also they will be able to state and explain Maxwell's equations and their implications for electromagnetic wave propagation.	K2
CO-4:	Understand and explain the basic principles of wave mechanics, including the Schrödinger equation, probability interpretation, and quantum harmonic oscillators.	K2
CO-5:	Define the key concepts of phase space, macrostates, microstates, and describe	K2

	the statistical distributions like Maxwell-Boltzmann, Fermi-Dirac, and Bose-Einstein.	
CO-6:	Understand the fundamental concepts in solid-state physics (e.g., crystal structure, magnetization, and hysteresis) and thermodynamics (e.g., black body radiation, entropy, and the laws of thermodynamics).	K2

COURSE CONTENT:

MODULE 1:	**MECHANICS**	**6 Hours**
Vector Calculus- gradient, divergence, curl; Frame of references, Mechanics of a single particle - conservative and non-conservative forces, potential energy function F= -grad V		
MODULE 2:	**ACCOUSTICS**	**5 Hours**
Simple harmonic oscillator, damped and forced motion and resonance; wave motion and equation.		
MODULE 3:	**OPTICS**	**7 Hours**
Interference - overview of interference phenomena, interference due to thin films- Newton's ring; Diffraction - single slit, double slit and grating; Polarization: introduction, polarization by reflection, scattering of light, circular and elliptical polarization, optical activity; Lasers - principle and working of laser, population inversion, pumping, various modes, threshold population inversion with examples.		
MODULE 4:	**ELECTROMAGNETISM**	**4 Hours**
Introduction (qualitative discussion), Maxwell's equations, wave equation, plane electromagnetic waves, Poynting's theorem.		
MODULE 5:	**WAVE MECHANICS**	**7 Hours**
Introduction to quantum physics, wave functions and Schrodinger equation, probability interpretation, particle in a 1D box, quantum harmonic oscillator, Hydrogen atom problem.		
MODULE 6:	**STATISTICAL MECHANICS**	**6 Hours**
Qualitative ideas about phase space, macrostates and microstates, density of states, qualitative discussion on Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein Statistics.		
MODULE 7:	**SOLID STATE PHYSICS**	**6 Hours**
Introduction of crystal structure, Bragg's law; Properties and applications of dielectric materials, Magnetisation- permeability and susceptibility, classification of magnetic materials, ferromagnetism, magnetic domains and hysteresis, applications.		
MODULE 8:	**THERMAL PHYSICS**	**3 Hours**
Black body radiation, 1st and 2nd law of thermodynamics, concept of entropy.		
	TOTAL LECTURES	**45 Hours**

Books:

1. Introduction to Electrodynamics, David J. Griffiths, Pearson Education India Learning Private Limited
2. Introduction to Classical Mechanics, R Takwale, P Puranik, McGraw Hill Education private limited
3. Engineering Physics , Dattuprasad Ramanlal Joshi, McGraw Hill Education private limited

4. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles,Robert Eisberg, Robert Resnick, Wiley
5. Statistical Physics, L.D. Landau, E M.Lifshitz, Butterworth-Heinemann
6. Optics,Ghatak, McGrawHill Education India Private Limited
7. Engineering Physics , Hitendra K Malik & A K Sing, McGraw Hill Education private limited
8. Advanced Acoustics, Dr. D.P. Raychaudhuri, The new bookstall, Revised Ninth Edition, 2009
9. Concepts of Modern Physics (Sixth Edition) by Arthur Beiser (Published by McGraw-Hill).
10. Introduction to Solid State Physics (January2019) by Charles Kittel (Published by Wiley)

Physics Lab (TIU-BS-UPH-L11101)

Program:B.Tech in CSE-AI	**Year, Semester:** 1st Yr, 1st Sem
Course Title:: Physics Lab	**Subject Code:**TIU-BS-UPH-L11101
Contact Hours/Week: 0–0–3(L–T–P)	**Credit:** 1.5

COURSE OBJECTIVE :

Enable the student to:

1. Provide hands-on experience with experimental techniques in optics, electricity, and mechanics
2. Develop a strong understanding of the fundamental physical constants and properties of materials
3. Enhance students' problem-solving and analytical skills through real-world applications

COURSE OUTCOME:

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

CO-1:	Develop hands-on skills in setting up experimental apparatus and accurately measuring physical quantities.	K3
CO-2:	Analyze experimental data using appropriate methods, interpret results, and assess the reliability and accuracy of measurements.	K4
CO-3:	Correlate theoretical physics principles with experimental observations to understand real-world applications.	K5
CO-4:	Demonstrate the ability to troubleshoot experimental issues and make informed decisions to optimize accuracy.	K5
CO-5:	Document experiments systematically and effectively present results, including calculations and error analysis.	K6
CO-6:	Work collaboratively in a lab environment, maintaining safety protocols and contributing to group discussions and analysis.	K6

COURSE CONTENT :

MODULE 1:	**EXPERIMENT : 1**	**3 Hours**
To determine the wavelength of a monochromatic light by Newton's ring		
MODULE 2:	**EXPERIMENT : 2**	**3 Hours**

To determine the dispersive power of a prism		
MODULE 3:	**EXPERIMENT : 3**	**3 Hours**
To determine the unknown resistance by Carey-Foster bridge		
MODULE 4:	**EXPERIMENT : 4**	**3 Hours**
Determination of e/m ratio of electron by J.J. Thomson method		
MODULE 5:	**EXPERIMENT : 5**	**3 Hours**
Determination of Plank's constant using photoelectric effect		
MODULE 6:	**EXPERIMENT : 6**	**3 Hours**
To determine the refractive index of water using travelling microscope		
MODULE 7:	**EXPERIMENT : 7**	**3 Hours**
To determine the Young's modulus/bending moment of a beam by flexure method		
MODULE 8:	**EXPERIMENT : 8**	**3 Hours**
To determine the rigidity modulus of a wire by dynamic method		
MODULE 9:	**EXPERIMENT : 9**	**3 Hours**
To determine the viscosity of water by capillary tube method		
MODULE 10:	**EXPERIMENT : 10**	**3 Hours**
To determine the thermal conductivity of a bad conductor by hot wire method		
MODULE 11:	**EXPERIMENT : 11**	**3 Hours**
Study of B-H loop of a magnetic material		
MODULE 12:	**EXPERIMENT : 12**	**3 Hours**
Study of electrical resistivity of metal and semiconductor by four probe method		
Total Hours (Any seven experiments to be performed)		**21 Hour**

Books:

1. Laboratory Manual
2. Advanced Practical Physics (Volume I and II) for BSc Physics Lab, B. Ghosh & K.G Mazumdar
3. An advanced course in practical physics by D . Chattopadhyay and P.C Rakshit, New central agency(P)Ltd.

Introduction to Programming Lab (TIU-ES-UCS-L11101)

Program: B. Tech. in CSE-AI	**Year, Semester:** 1st Yr., 1st Sem
Course Title: Introduction to Programming Lab	**Subject Code:** TIU-ES-UCS-L11101
Contact Hours/Week: 0–0–3 (L–T–P)	**Credit:** 1.5

COURSE OBJECTIVE

Enable the student to:

1. Introduce students to the fundamentals of C programming, including syntax, data types, operators, and control structures, enabling them to write and execute basic programs.
2. Develop students' ability to analyze problems, apply algorithmic thinking, and implement solutions using decision-making constructs, loops, functions, and data structures.

3. Equip students with hands-on experience in using arrays, strings, pointers, structures, and unions, enabling them to develop efficient programs for mathematical computations, data processing, and real-world applications.

COURSE OUTCOME

CO-1	Demonstrate the ability to write, compile, and execute simple C programs using basic input-output functions, arithmetic operations, and control statements.	K2
CO-2	Apply conditional statements (if-else, ternary operator, switch-case) and looping constructs (for, while, do-while) to solve mathematical and logical problems.	K3
CO-3	Solve mathematical problems such as factorial, permutations & combinations, series summation, and trigonometric computations using C programming.	K3
CO-4	Develop programs using arrays and strings to perform operations such as searching, sorting, frequency analysis, and string transformations.	K4
CO-5	Utilize pointers, structures, and unions in C to perform complex operations such as matrix manipulations, complex number arithmetic, and data organization.	K4
CO-6	Implement user-defined functions and demonstrate the ability to use memory management functions, pointers, and structures for efficient data handling.	K4

COURSE CONTENT

MODULE 1:	**Introduction to C Programming & Basic Operations**	**6 Hours**
Writing and executing a basic C program (Hello World). Understanding Input/Output functions (printf(), scanf()). Variables, Data Types, and Memory Allocation. Arithmetic operations and simple mathematical computations		
MODULE 2:	**Control Structures & Decision Making**	**6 Hours**
Conditional statements (if-else, ternary operator, switch-case). Looping constructs (for, while, do-while). Nested control structures.		
MODULE 3:	**Functions, Recursion & Pattern Printing**	**6 Hours**
Defining and calling user-defined functions. Function parameters, return types, and recursion. Printing patterns using loops (*, numbers, alternating 0/1). Mathematical computations using recursion (Factorial, nCr).		
MODULE 4:	**Arrays & Strings**	**9 Hours**
One-dimensional and two-dimensional arrays. Searching & sorting algorithms. String operations		

(length, frequency analysis, conversion to uppercase/lowercase).		
MODULE 5:	**Pointers, Structures & Memory Management**	**9 Hours**
Pointer concepts and memory addresses. Pointer arithmetic and array manipulation using pointers. Structures and Unions for data organization. Dynamic memory allocation concepts.		
MODULE 6:	**Advanced Programming & Applications**	**9 Hours**
Matrix operations (Addition, Multiplication). Trigonometric function computations (sin, cos values at intervals). File handling concepts (basic read/write operations).		
	TOTAL LAB HOURS	**45 Hours**

Books:

1. B W Kernighan and D.M. Ritchie, The C Programming Language, Prentice Hall of India.
2. K. Venugopal and Sudeep R Prasad, Programming with C, McGraw Hill
3. R G Dromey, How to solve it by Computer, Prentice Hall in India.

Engineering Drawing and Graphics (TIU-ES-UME-L11191)

Program: B. Tech in CSE-AI	**Year, Semester:** 1st year, 1st Semester
Course Title: Engineering Drawing and Graphics	**Subject Code:** TIU-ES-UME-L11191
Contact hours/week: 0-0-3 (L-T-P)	**Credit:** 1.5

COURSE OBJECTIVE:

Enable the student to:

1. Develop an understanding of the fundamental concepts and significance of engineering drawing in various engineering disciplines.
2. Acquire skills to construct and analyze engineering curves, projections of points, lines, planes, and solids.
3. Learn to interpret and create orthographic and isometric projections using conventional and computer-aided drafting techniques.
4. Gain proficiency in using drafting software for preparing accurate engineering drawings.

COURSE OUTCOME:

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

CO-1:	Understand the fundamental principles and scope of engineering drawing across various engineering disciplines.	K2
CO-2:	Demonstrate proficiency in constructing and analyzing different engineering curves.	K3
CO-3:	Apply projection techniques for points, lines, planes, and solids in different orientations.	K3
CO-4:	Develop skills to create orthographic and isometric projections accurately.	K3

CO-5:	Interpret and convert between pictorial, orthographic, and isometric views of objects.	K3
CO-6:	Utilize computer-aided drafting tools to create precise engineering drawings.	K3

COURSE CONTENT :

MODULE 1:	**Introduction**	**6 Hours**
Scope of Engineering Drawing in all Branches of Engineering, Uses of Drawing Instruments and Accessories, Types of Arrowheads, Lines, Dimension System, Representative Fraction, Types of Scales (plain and Diagonal Scale).		
MODULE 2:	**Engineering Curves**	**6 Hours**
Classification of Engineering Curves, Application of Engineering Curves, Constructions of Engineering Curves (Conics-ellipse; parabola; hyperbola with Tangent and Normal).		
MODULE 3:	**Projection of Points and Straight Lines**	**9 Hours**
Types of Projections - Oblique, Perspective, Orthographic and Isometric Projections; Introduction to Principal Planes of Projections, Projections of Points located in all four Quadrants; Projections of lines inclined to one of the Reference Plane and inclined to two Reference Planes.		
MODULE 4:	**Projections of Planes and Solids**	**9 Hours**
Projections of various planes (Polygonal, Circular, Elliptical shape inclined to one of the reference planes and two of the reference planes) and Projections of Solids (cube, prism, pyramid, cylinder, cone and sphere).		
MODULE 5:	**Orthographic Projections & Isometric View/Projections**	**8 Hours**
Projections on Principal Planes from Front, Top and Sides of the Pictorial view of an Object, First Angle Projection and Third Angle Projection system; Full Sectional Orthographic Views, Conversion of Orthographic Views into Isometric Projection, View or Drawing; Isometric Scale.		
MODULE 6:	**Overview of Computer Aided Drafting Tools**	**1 Hours**
Introduction to Computer Aided Drafting Software; Basic Tools; Preparation of Orthographic Projections and Isometric Views Using Drafting Software.		
	TOTAL LAB HOURS	**39 Hours**

Books:

Main Reading:

1. Jolhe, Dhananjay A, Engineering Drawing an introduction to AutoCAD, Tata McGraw-Hill.
2. N.D. Bhatt, Engineering Drawing, Charotar Publishing House Pvt. Ltd.

Basic Computing Lab (TIU-ES-UCS-L11191)

Program: B. Tech. in CSE-AI	**Year, Semester:** 1st Yr., 1st Sem.

Course Title: Basic Computing Lab	**Subject Code:**TIU-ES-UCS-L11191
Contact Hours/Week: 0–0–2 (L–T–P)	**Credit:** 1

COURSE OBJECTIVE:

Enable the student to:

1. To introduce students to the UNIX/Linux environment and familiarize them with fundamental system operations, commands, and file management techniques.
2. To develop proficiency in shell scripting and command-line utilities for automating tasks, managing processes, and handling files efficiently.
3. To provide hands-on experience with GitHub operations and debugging techniques while enhancing students' ability to work with text processing tools, redirection, and file compression in a UNIX/Linux environment.

COURSE OUTCOME:

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

CO-1	Be Familiar with the UNIX/Linux operating system	K2
CO-2	Develop proficiency in using shell commands and writing basic shell scripts.	K3
CO-3	Understand file systems, process management, and user permissions.	K2
CO-4	Understand basic github operations and debugging of programs	K3
CO-5	Apply fundamental text processing tools and commands such as grep, find, and text editors (vi/nano) for efficient file manipulation and searching.	K4
CO-6	Utilize redirection, piping, and file compression techniques to manage data effectively in a UNIX/Linux environment.	K4

COURSE CONTENT :

MODULE 1:	**INTRODUCTION TO UNIX/LINUX AND BASIC COMMANDS**	**9 Hours**
Overview of UNIX/Linux operating systems, Logging into UNIX/Linux systems, Basic system commands: ls, cd, pwd, cp, mv, rm, clear, man, who, date, cal, etc. Understanding the file system hierarchy: /, /home, /bin, /usr, /var, etc.		
MODULE 2:	**FILE AND PROCESS MANAGEMENT**	**9 Hours**
File and Directory Management: Creating, removing, and organizing files and directories, Commands: mkdir, rmdir, touch, chmod, chown, rm, find, etc. Understanding file permissions and ownership (rwx permissions, chmod command) Process Management: Viewing active processes (ps, top, htop), Controlling processes: kill, bg, fg, jobs, nice, and renice,Understanding process states: running, sleeping, zombie.		
MODULE 3:	**TEXT PROCESSING AND BASIC SHELL SCRIPTING**	**9 Hours**
Text Editors (vi, nano): Creating, editing, saving, and existing files, Working with commands like grep, cat, more, less, sed, and awk Basic Shell Scripting: Writing simple shell scripts (bash), Understanding variables, loops (for, while), and conditional statements (if, elif, else), Creating automation scripts for file operations and system monitoring		

MODULE 4:	REDIRECTION, PIPING, AND FILE COMPRESSION	9 Hours
Redirection and Piping: Input/output redirection (>, >>, <) Piping (|) for command chaining File Compression and Archiving: Working with gzip, tar, zip, unzip,Creating and extracting archives for data backup		
MODULE 5:	**GITHUB BASICS AND DEBUGGING TECHNIQUES**	**9 Hours**
Using GitHub for Version Control: Setting up a GitHub repository, Basic commands: git init, git add, git commit, git push, git pull, git clone,Checking in and checking out files Debugging Techniques: Identifying and resolving errors in shell scripts, Using debugging tools (echo, set -x, gdb for C programs)		
	TOTAL LAB HOURS	**45 Hours**

Books:

1. "UNIX and Linux System Administration Handbook" – Evi Nemeth, Garth Snyder, Trent R. Hein, Ben Whaley, and Dan Mackin
2. "The Linux Command Line: A Complete Introduction" – William E. Shotts Jr.
3. "Learning the bash Shell"– Cameron Newham.