Shri Vile Parle Kelavani Mandal's
DWARKADAS J.SANGHVI COLLEGE OF ENGINEERING
(Empowered Autonomous College Affiliated to the University of Mumbai)

Shri Vile Parle Kelavani Mandal's

Dwarkadas J. Sanghvi College of Engineering

(Empowered Autonomous College Affiliated to the University of Mumbai)

Scheme and detailed syllabus (D26)

First Year B. Tech.

in

Electronics and Telecommunication Engineering

(Semester I)

With effect from the Academic Year: 2026-2027

Shri Vile Parle Kelavani Mandal's
DWARKADAS J.SANGHVI COLLEGE OF ENGINEERING
(Empowered Autonomous College Affiliated to the University of Mumbai)

Branch:- Electronics and Telecommunication Engineering, Sem I

			Teaching Scheme				Semester End Assessment (A)						Continuous Assessment (B)						Aggregate (A+B)	Credits Earned
Sr. No	Course Code	Subject	Theory	Practical	Tutorial	Credit	Duration (hrs.)	Theory	Oral	Pract.	Oral & Pract.	SEE Total (A)	Term Test 1 (TT1)	Term Test 2 (TT2)	Assignment/ course project/ group discussion/ presentation / quiz/ any other	Total (TT1, TT2 & Assignment)	Term Work Total	CA Total (B)		
1	D26EBS101	Engineering Mathematics	3			3	2	60				60	15	15	10	40		40	100	4
	D26EBS101T	Engineering Mathematics Tutorial			1	1											25	25	25	
2	D26EBS102	Engineering Chemistry for Semiconductor and Electronic Applications	2			2	2	60				60	15	15	10	40		40	100	3
	D26EBS102L	Engineering Chemistry for Semiconductor and Electronic Applications Laboratory		2		1											25	25	25	
3	D26EES101	Structured Programming using C	2			2	2	60				60	15	15	10	40		40	100	3
	D26EES101L	Structured Programming using C Laboratory		2		1	2				25	25					25	25	50	
4	D26EES102	Engineering Graphics #	2			2	2	60				60	15	15	10	40		40	100	3
	D26EES102L	Engineering Graphics Laboratory		2		1											25	25	25	
5	D26EES103	Basic Electrical Engineering and Digital Electronics	2			2	2	60				60	15	15	10	40		40	100	3
	D26EES103T	Basic Electrical Engineering and Digital Electronics Tutorial			1	1											25	25	25	
6	D26ESC101L	Ideation and Innovation Laboratory		2		1											25	25	25	1
7	D26ELL101T	Health and Wellness			2	2											50	50	50	2
8	D26ESC149	Artificial Intelligence Foundations*	1			1							15	15	10			40	40	1

* Online Course to be completed on Coursera
# Computer based assessment in the college premises only.

Semester End Assessment (A):

Course	Assessment Tools	Marks	Time (hrs.)
Theory / * Computer based	Written paper based on the entire syllabus.	60	2
	* Computer based assessment in the college premises.		
Oral	Questions based on the entire syllabus.	25	As applicable
Practical	Performance of the practical assigned during the examination and the output / results obtained.	25	2
Oral & Practical	Project based courses - Performance of the practical assigned during the examination and the output / results obtained. Based on the practical performed during the examination and on the entire syllabus.	As per the scheme	2

Continuous Assessment (B):

Course	Assessment Tools	Marks	Time (mins)
Theory	a. Term Test 1 (based on 50 % syllabus)	15	45
	b. Term Test 2 (on next 50 % syllabus)	15	45
	c. Self-learning (Assignment / course project / group discussion / presentation / quiz/ any other.)	10	--
	Total marks (a + b + c)	40	--
Audit course	Performance in the assignments / quiz / power point presentation / poster presentation / group project / any other tool.	--	As applicable
Laboratory	Performance in the laboratory and documentation.	25	
Tutorial	Performance in each tutorial & / assignment.	25	
Laboratory &Tutorial	Performance in the laboratory and tutorial.	50	

The final certification and acceptance of term work will be subject to satisfactory performance upon fulfilling minimum passing criteria in the term work / completion of audit course.

Program: Electronics and Telecommunication Engineering	First Year B. Tech.	Semester: I
Course: Engineering Mathematics (D26EBS101)		
Course: Engineering Mathematics Tutorial (D26EBS101T)		

Pre-requisites: -- Knowledge of

1. Inverse of a matrix, addition, multiplication and transpose of a matrix.
2. Algebra of Complex Numbers. Geometric representation of complex numbers. Cartesian, polar and exponential form of complex numbers. Complex conjugate.
3. Basics of Differential Calculus.

Objectives:

1. To develop the fundamental mathematical skills required for understanding and solving engineering problems.
2. To strengthen analytical thinking and logical reasoning through the application of mathematical concepts.
3. To provide a foundation in mathematical methods that support advanced studies in various branches of engineering and technology.
4. To enable students to formulate and solve real-life engineering problems using appropriate mathematical techniques.
5. To enhance the ability to represent and interpret mathematical concepts through graphical and visual approaches.
6. To provide exposure to visualization tools such as R Programming, SciLab, Desmos, and GeoGebra for graphical representation and better understanding of mathematical ideas.

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

1. Apply matrix operations to determine rank and echelon forms of matrices and solve systems of simultaneous linear equations.
2. Apply the concepts of complex numbers to solve problems involving hyperbolic functions and logarithmic functions.
3. Expand functions using appropriate mathematical techniques and evaluate their applicability in engineering problems.
4. Apply the principles of partial differentiation to determine maxima, minima, and Jacobians of multivariable functions.
5. Use R Programming/SciLab/Desmos/GeoGebra for graphical visualization and interpretation of mathematical concepts and solutions.

Engineering Mathematics (D26EBS101)		
Unit	**Description**	**Duration**
1	**Matrices:** • Types of Matrices: Symmetric, Skew- Symmetric, Hermitian, Skew-Hermitian, Unitary, Orthogonal Matrices. Rank of a matrix using Echelon form. • System of homogeneous and non–homogeneous equations, their consistency and solutions. Linear dependent and independent vectors.	**8**
2	**Complex Numbers, Hyperbolic function and Logarithm of Complex Numbers:** • Review statement of D'Moivre's Theorem.	**12**

	• Application of D'Moivre's Theorem: Find expansion of $\sin^n\theta, \cos^n\theta$ in terms of sines and cosines of multiples of θ, expansion of sin nθ, cos nθ in powers of sin θ, cos θ and to find sum of the trigonometric series. • Roots of complex number. • Circular functions of complex number and Hyperbolic functions. Inverse Circular and Inverse Hyperbolic functions. Separation of real and imaginary parts of all types of functions. • Logarithmic functions, Separation of real and Imaginary parts of Logarithmic functions.	
3	**Expansion of Function:** • Taylor's Theorem (Statement only), Taylor's series and Maclaurin's series (Statement only). Expansion of standard functions.	**4**
4	**Partial Differentiation:** • Partial Differentiation: Function of several variables, Partial derivatives of first and higher order, Differentiation of composite function, Total differentials and Implicit functions. • Euler's Theorem on Homogeneous functions with two and three independent variables (with proof). Deductions from Euler's theorem. **Applications of Partial Differentiation:** • Maxima and Minima of a function of two independent variables. • Jacobian's of two and three independent variables.	**14**
5	**Numerical Solutions of Transcendental Equations, System of Linear Algebraic Equations, Curve fitting:** • Solution of Algebraic and Transcendental Equations by: Newton Raphson Method. • Solution of system of linear algebraic equations by Gauss Seidal Iteration Method. • Curve fitting: Fitting a straight line, Quadratic curve.	**4**
	Total	**42**

Engineering Mathematics Tutorial (D26EBS101T)	
Sr. No.	**Tutorial Title**
	Tutorials for Theoretical and Conceptual Learning
1	Matrices.
2	Complex Numbers.
3	Hyperbolic and Logarithm of complex numbers.
4	Expansion of Function.
5	Partial Differentiation.
6	Application of Partial Differentiation.
	Hands-on Tutorials using R Programming/SciLab/Desmos/GeoGebra
7	Matrices.
8	Solution of Transcendental Equations by Newton Raphson Method.
9	Solution of system of linear algebraic equations by Gauss Seidal Iteration Method.
10	Curve Fitting.

A minimum of eight tutorials (including R programming language/SciLab/Desmos/GeoGebra) from the above-suggested list or any other experiment based on the syllabus will be included, which would help the learner to apply the concept learnt.

Self -Learning Plan:

The subject teacher will identify the self-learning topics and ensure that students develop a deeper understanding of their relevance to industry and society. Further, the details of the self-learning activity, assessment methods, and rubrics will be provided in the self-learning plan of the course.

Evaluation Scheme:

Semester End Examination (A):

Theory:

1. Question paper based on the entire syllabus will comprise of 4 questions (All compulsory, but with internal choice having sub questions as appropriate), total summing up to 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

Continuous Assessment (B):

Theory: (Term test: 40 Marks)

1. Assessment consists of two class tests of 15 marks each and self -learning assessment (SLA) of 10 marks. The first-class test (TT1) is to be conducted when approx. 50% syllabus is completed and second-class test (TT2) when rest 50% syllabus is completed.
2. Total duration allotted for writing each of the class tests is 45 mins.
3. The SLA of 10 marks is based on self- learning topics conducted as Assignments, Case study, Report writing, Quiz etc. and the distribution of marks will be as per Self-learning Rubrics designed by the subject teacher.

Tutorial (Term work: 25 Marks)

1. Term work shall consist of Tutorials with submission.
2. Batch wise Tutorials are to be conducted to develop a rational temperament for scientific observations which lead to constructive inferences essential for technology studies. Students must be encouraged to perform minimum eight experiments and submit the Term Work.
3. An additional laboratory/tutorial activity based on self-learning topics in the form of Lab demonstration experiment, Virtual Lab, Simulation Lab, extra tutorial, case study should be conducted and assessed.
4. The distribution of 25 marks for term work should be as per the Rubrics designed for the Laboratory work by the subject teacher.

Books Recommended:

Textbooks:

- Higher Engineering Mathematics, Dr. B. S. Grewal, Khanna Publication.
- Advanced Engineering Mathematics, Dennis G. Zill, Warren S. Wright.
- Andrie de Vries and Joris Meys, R Programming for Dummies, 2nd Edition, Wiley.

Reference Books:

- Foundations of Complex Analysis, S. Ponnusamy, Narosa Publications.
- Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Eastern Limited, 9th Ed.

- Advanced Engineering Mathematics by H. K. Dass, 28th edition, S. Chand 2010.
- Introductory Methods of Numerical Analysis, S.S. Sastry, Eastern Economy Edition.
- Numerical Methods, M. K. Jain, R. K. Jain, S. R. K. Iyengar, New Age International Publishers.
- Matrices, Shanti Narayan, S. Chand publication.
- Applied Numerical Methods with MATLAB for Engineers and Scientists by Steven Chapra, McGraw Hill.
- Elementary Linear Algebra with Application by Howard Anton and Christ Rorres, 6th edition, John Wiley & Sons, INC.
- Jared P. Lander, R for Everyone: Advanced Analytics and Graphics, 2nd Edition, Addison-Wesley Data & Analytics Series.

Web References:

- Engineering Mathematics - I:(https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ma133)
- Advanced Calculus for Engineers : (https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ma130)
- Calculus of One Real Variable: (https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ma91)
- Calculus of Several Real Variables: (https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_ma92)

Program: Electronics and Telecommunication Engineering	First Year B. Tech.	Semester: I
Course: Engineering Chemistry for Semiconductor and Electronic Applications (D26EBS102)		
Course: Engineering Chemistry for Semiconductor and Electronic Applications Laboratory (D26EBS102L)		

Pre-requisites:

1. Basic process of polymerization and its properties and types.

Objectives:

1. To obtain a strong hold on basic concepts of Chemistry that form fundamental principles of technology.
2. To give exposure to recent material development in the field of engineering.
3. To understand chemical processes involved in IC fabrication.
4. To analyse the phase transition parameters of the material.

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

1. Describe new approach of chemical analysis which is convenient to perform.
2. Describe applications based on nanomaterials and modern polymers in engineering techniques.
3. Illustrate the oxidation and doping mechanism.
4. Recognize the etching process involved in IC fabrication.
5. Recognize properties of materials and alloys with phase transformation.

Engineering Chemistry for Semiconductor and Electronic Applications (D26EBS102)		
Unit	**Description**	**Duration**
1	**Spectroscopic Techniques and Applications:** • Introduction: Electromagnetic spectrum, its origin, properties and applications. Numericals based on energy of photon. • Spectroscopy: Principle, classification and types. • Relation between electromagnetic spectrum, spectroscopy types and energy changes. • Flame Photometry: Principle, Instrumentation, working, applications, interferences, advantages and disadvantages. • Jablonski diagram, Introduction to florescence and phosphorescence. • Applications of fluorescence.	**5**

2	**Engineering Materials:**
	• **Nanomaterials**
	  • Introduction to nanomaterials.
	  • Fullerenes: Properties and applications.
	  • Carbon nanotubes: Types, Properties, Method of preparation (Laser, CVD), Applications.
	• **Polymers**
	  • Photoresists
	  • Effect of heat on polymers (glass transition temperature), Viscoelasticity.
	  • Conducting Polymers and applications.
		5

3	**IC Fabrication Processes-I:** **Oxidation**	**7**

	• Introduction • Growth Mechanism and Kinetics • Thin Oxides • Oxidation Techniques and Systems • Oxide Properties **Diffusion and Ion implantation:** • Models of Diffusion in Solids • Fick's One-Dimensional Diffusion Equations • Atomic Diffusion Mechanisms • High-Energy Implantation • Implantation Equipment • Annealing	
4	**IC Fabrication processes-II:** **Etching** **Wet chemical etching** • Crystalline Materials • Application to Silicon • Anisotropic Effects • Selective Etches **Dry physical etching** • Ion Beam Etching • Sputter Etching **Dry chemical etching** • Photoresist Removal • Pattern Delineation **Reactive plasma etching** • Plasma Properties • Feature-Size Control and Anisotropic Etch Mechanisms • Reactive Plasma-Etching Techniques and Equipment	**7**
5	**Phase Diagrams and Solid Solubility:** • Unitary Diagrams • Binary Diagrams • The Phase Rule • Isomorphous Diagrams • Eutectic Diagrams • Compound Formation	**4**
	Total	**28**

Engineering Chemistry for Semiconductor and Electronic Applications Laboratory (D26EBS102L)	
Sr. No.	**Experiment Title**
	Performance-Based Experiments (Hands-on and Simulation Tools)
1	To estimate the emf of Cu-Zn system by Potentiometry.
2	To determine λ_{max} of a given solution by using UV Spectrophotometer.
3	To validate Beer-Lambert law using UV Spectrophotometer/ colorimeter.
4	Wet Etching Demonstration Using Metals.

5	Simulation of Silicon Oxidation Kinetics.
6	Oxide Thickness Calculation Program.
7	Simulation of Dopant Diffusion Profiles.
8	To determine metal ion concentration using colorimeter.
9	Determination of strength of a given solution (Acid/Base) by using conductometric titration.
10	Construction of concentration cell and determination of emf by potentiometry.

A minimum of eight experiments from the above-suggested list or any other experiment based on the syllabus will be included, which would help the learner to apply the concept.

Self -Learning Plan:
The subject teacher will identify the self-learning topics and ensure that students develop a deeper understanding of their relevance to industry and society. Further, the details of the self-learning activity, assessment methods, and rubrics will be provided in the self-learning plan of the course.

Evaluation Scheme:
Semester End Examination (A):
Theory:

1. Question paper based on the entire syllabus will comprise of 4 questions (All compulsory, but with internal choice having sub questions as appropriate), total summing up to 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

Continuous Assessment (B):
Theory: (Term test: 40 Marks)

1. Assessment consists of two class tests of 15 marks each with self -learning assessment (SLA) of 10 marks. The first-class test (TT1) is to be conducted when approx. 50% syllabus is completed and second-class test (TT2) when rest 50% syllabus is completed.
2. Total duration allotted for writing each of the class tests is 45 mins.
3. The SLA of 10 marks is based on self- learning topics conducted as Assignments, Case study, Report writing, Quiz etc. and the distribution of marks will be as per Self-learning Rubrics designed by the subject teacher.

Laboratory (Term work: 25 Marks)

1. Term work shall consist of Laboratory work with submission.
2. Batch wise laboratory work is to be conducted to develop a rational temperament for scientific observations which lead to constructive inferences essential for technology studies. Students must be encouraged to perform minimum eight experiments and submit the laboratory Journal.
3. An additional laboratory activity based on self-learning topics in the form of Lab demonstration experiment, Virtual Lab, Simulation Lab, case study should be conducted and assessed.

The distribution of 25 marks for term work should be as per the Rubrics designed for the Laboratory work by the subject teacher.

Books Recommended:
Textbooks:

- Sorab K. Ghandhi, VLSI Fabrication Principles: Silicon and Gallium Arsenide, Wiley, 1994.
- S. M. Sze, VLSI Technology, McGraw Hill, 1983.
- Jain & Jain, Engineering Chemistry, Dhanpat Rai, 2013.

- S.S. Dara, A textbook of Engineering Chemistry, S. Chand, 1986.
- Y.R. Sharma, Elementary Organic Spectroscopy, S. Chand, 2013.
- A.K. Bandyopadhyay, Nanomaterials, New Age International Pvt Ltd / New Age Science, 2010.

Reference Books:

- Stephen A. Campbell, The Science and Engineering of Microelectronic Fabrication, Oxford University Press, 2001.
- Engineering Chemistry, Wiley India, (ISBN – 9788126519880), 2011.
- Shashi Chawla, A Text Book of Engineering Chemistry, Dhanpat Rai, 2017.
- B S Bahl, Arun Bahl, G D Tuli, Essentials of Physical Chemistry, S. Chand, 2022.
- Colin N. Banwell, Fundamentals of molecular spectroscopy, McGraw-Hill Publications, 2017.
- J. Michael Hollas, Basic Atomic and Molecular Spectroscopy, Royal Society of Chemistry, 2002.
- Thomas Varghese & K.M. Balakrishna, Nanotechnology: An Introduction to Synthesis, Properties and Applications of Nanomaterials, Atlantic Publishers & Distributors (P) Ltd, 2023.

Web References:

- Fundamentals of Spectroscopy (https://onlinecourses.nptel.ac.in/e-learning/preview/noc24_cy14)
- Polymers: Concepts, Properties, Uses and Sustainability (https://onlinecourses.nptel.ac.in/e-learning/preview/noc25_ch51)
- Basic Overview of Semiconductor Device Processing and IC Fabrication (http://www.digimat.in/nptel/courses/video/108104865/L36.html)

Program: Electronics and Telecommunications Engineering	First Year B. Tech.	Semester: I
Course: Structured Programming using C (D26EES101)		
Course: Structured Programming using C Laboratory (D26EES101L)		

Pre-requisites: None

Objectives:

1. To familiarize with the logic of Computer Programming.
2. To provide exposure in developing algorithm, flowchart and thereby writing efficient codes for user defined problem.

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

1. Implement the programs in C.
2. Debug the C programs.

Structured Programming using C (D26EES101)		
Unit	**Description**	**Duration**
1	**Basics of Programming:** Introduction to programming paradigms, Structure of C program, Algorithm & Flowchart, Compilation process: Syntax and semantic errors, Character Set, Identifiers and keywords, Data types, Constants, Variables, Operators-Arithmetic, Relational and logical, Assignment, Unary, Conditional, Bitwise, Comma, and other operators, precedence and associativity, Library Functions, Preprocessor, Data Input and Output – getchar (), putchar (), scanf (), printf (), fgets (), puts (), Structure of C program.	**04**
2	**Control Structures:** Decision making with Branching - If statement, If-else Statement, Switch case statement, Looping – while, do-while, for, Nested control structure, Continue statement, Break statement, goto statement.	**05**
3	**Functions and Parameter:** Function -Introduction of Function, defining a Function, accessing a Function, Function Prototype, Passing Arguments to a Function, Designing Recursive function, Storage Classes –Auto, Extern, Static, Register	**04**
4	**Arrays and its applications:** Array-Concepts, Declaration, Definition, accessing array element, One- dimensional and Multidimensional array, Passing Arrays to Function, Sorting algorithms: Bubble sort, Insertion sort, Selection sort, radix sort Searching algorithms: Linear search, Binary search, String- Basics of String, Functions in string.h, user defined function for string handling	**07**
5	**Structures and Unions:** Declaration, Initialization, structure within structure, Operation on structures, Array of Structure, Structure padding, Union, comparison of Structures and Union	04
6	**Pointers and File handling:** Introduction to Pointers, Pointer Declaration, Call by Value, Call by Reference, Opening and closing files, reading and writing to files, operations on files.	04
	Total	**28**

A) **Course: Structured Programming using C Laboratory (D26EES101L)**	
Exp.	**Suggested experiments**
1	Write a program to swap two variables values with and without using third variables. Write algorithm and draw flowchart for the same.
2	Write a program to check odd or even number: (a) using modulus operator (b) using conditional operator.
3	Design and develop a C program to read a year as an input and find whether it is leap year or not. Also consider the end of the centuries. Write algorithm and draw flowchart for the same.
4	Write a C program to find the sum of individual digits of a 3-digit number.
5	Design and develop a flowchart or an algorithm that takes three coefficients (a, b, and c) of a Quadratic equation ($ax^2 + bx + c = 0$) as input and compute all possible roots. Implement a C program for the developed flowchart/algorithm and execute the same to output the possible roots for a given set of coefficients with appropriate messages.
6	Write a program to count the number of digits in a given integer.
7	Write a menu driven program to perform simple arithmetic operations based on the user's choice. The user will indicate the operation to be performed using the signs e.g. + for addition, etc. Write an algorithm and draw flowchart for same.
8	Write a program to read a number of more than one digit, reverse the number and display the sum of digits of numbers. Write algorithm and draw flowchart for the same.
9	Write programs to display each of the following patterns. B) 1 2 1 3 2 1 4 3 2 1 5 4 3 2 1 B) A ABA ABCBA ABCDCBA ABCDEDCBA
10	Write a C program to find maximum and minimum between two numbers using functions. Write algorithm and draw flowchart for the same.
11	Write C program to find GCD of two integers by using recursive function.
12	Write a C program to find both the largest and smallest number in a list of integers. Write algorithm and draw flowchart for the same.
13	Develop, implement and execute a C program that reads two matrices A (m x n) and B (p x q) and Compute product of matrices A and B. Read matrix A and matrix B in row major order and in column major order respectively. Print both the input matrices and resultant matrix with suitable headings and output should be in matrix format only.
14	Write a Program for deletion of an element from the specified location from Array.
15	Write a C program that implements the following sorting methods to sort a given list of integers in ascending order i) Bubble sort ii) Selection sort iii)Insertion sort
16	Write C programs that use both recursive and non-recursive functions to perform the following searching operations for a Key value in a given list of integers: i) Linear search ii) Binary search
17	Write a C program using user defined functions to determine whether the given string is palindrome or not.

18	Create a structure named "Employee" to store employee details such as employee ID, name, and salary. Write a program to input data for three employees, find the highest salary employee, and display their information.
19	Demonstrate Union for displaying student record.
20	Demonstrate the concept of Call by Value and Call by Reference in C programming by passing variables to functions and observing the effect of modifications on the original variables.
21	Read any text file (e.g. info.txt) and write its content to a new file (no_vowels.txt), excluding all lowercase and uppercase vowels (A, E, I, O, U, a, e, i, o, u).

Self -Learning Plan:

The subject teacher will identify the self-learning topics and ensure that students develop a deeper understanding of their relevance to industry and society. Further, the details of the self-learning activity, assessment methods, and rubrics will be provided in the self-learning plan of the course.

Evaluation Scheme:

Semester End Examination (A):

Theory:

1. Question paper based on the entire syllabus will comprise of 4 questions (All compulsory, but with internal choice having sub questions as appropriate), total summing up to 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

Continuous Assessment (B):

Theory: (Term test: 40 Marks)

1. Assessment consists of two class tests of 15 marks each with self -learning assessment (SLA) of 10 marks. The first-class test (TT1) is to be conducted when approx. 50% syllabus is completed and second-class test (TT2) when rest 50% syllabus is completed.
2. Total duration allotted for writing each of the class tests is 45 mins.
3. The SLA of 10 marks is based on self- learning topics conducted as Assignments, Case study, Report writing, Quiz etc. and the distribution of marks will be as per Self-Learning Rubrics designed by the subject teacher.

Laboratory (Term work: 25 Marks)

1. Term work shall consist of Laboratory work with submission.
2. Batch wise laboratory work/Tutorial work is to be conducted to develop a rational temperament for scientific observations which lead to constructive inferences essential for technology studies. Students must be encouraged to perform all experiments and submit the laboratory Journal.
3. An additional laboratory/tutorial activity based on self-learning topics in the form of Lab demonstration experiment, Virtual Lab, Simulation Lab, case study should be conducted and assessed.
4. The distribution of 25 marks for term work should be as per the Rubrics designed for the Laboratory work by the subject teacher.

Books Recommended:

Textbooks:

- MASTERING C" by K.R.Venugopal and Sudeep R.Prasad , Tata McGraw-Hill Publications.

- "A Computer Science –Structure Programming Approaches using C", by Behrouz Forouzan, Cengage Learning.
- Schaum's outlines "Programming with C", by Byron S. Gottfried, Tata McGraw-Hill Publications.

Reference Books:

- "Basics of Computer Science", by BehrouzForouzan , Cengage Learning.
- "Programming Techniques through C", by M. G. Venkateshmurthy, Pearson Publication.
- "Programming in ANSI C", by E. Balaguruswamy, Tata McGraw-Hill Education.
- "Programming in C", by Pradeep Day and Manas Gosh, Oxford University Press.
- "Let Us C", by Yashwant Kanetkar, BPB Publication.

Web References:

- Problem Solving Through Programming In C – https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs53

Program: Electronics and Telecommunication Engineering	F.Y B. Tech.	Semester: I
Course: Engineering Graphics (D26EES102)		
Course: Engineering Graphics Laboratory (D26EES102L)		

Pre-requisite: --

1. Basics of geometrical constructions

Objectives:

1. Students should be able to visualize the objects.
2. They should be able to understand and read drawing.
3. To impart and inculcate proper understanding of the theory of projection.
4. They should be able to present the same.

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

1. Recognize the value of engineering graphics, as a language of engineers.
2. Construct orthographic views of basic shapes of solids.
3. Interpret and sketch orthographic and sectional orthographic views of various machine components.
4. Visualize objects, and draw isometric views.
5. Build 2D sketches using Auto CAD.

Engineering Graphics (D26EES102)		
Unit	**Description**	**Duration**
1	**Introduction to Engineering Drawing**. Types of Lines, Dimensioning Systems as per IS conventions, Types of Projections. ****Introduction to Auto CAD**: - Basic Drawing and Editing Commands. Knowledge of setting up layers Dimensioning, Hatching, plotting and Printing	**03**
2	**Orthographic projections:-** Different views of simple machine parts as per the first angle projection method recommended by I.S. ****Drawing of orthographic projections using Auto CAD.**	**05**
3	**Sectional Orthographic projections:-** Concept of sectioning and drawing section lines, need for drawing sectional views, Section of simple geometrical solids-cases involving different types of cutting planes. ****Drawing of Sectional orthographic projections using Auto CAD.**	**06**
4	**Isometric Views: -** Isometric Views/Drawings of blocks (plain and cylindrical, excluding spheres). ****Drawing of Isometric Views using Auto CAD.**	**06**
5	**Projection of Solids: -** (Prism, Pyramid, Cylinder & Cone only) Projections of Solids with the axis inclined to HP and VP. (Exclude Spheres, Composite, Hollow solids and frustum). Use change of position or Auxiliary plane method. ****Drawing of Projection of Solid using Auto CAD.**	**08**
	Total	**28**

**** Should be covered during Auto CAD Practical.**

Engineering Graphics Laboratory (D26EES102L)	
Exe.	**Suggested exercise**
1	Orthographic Projections model 1 Using Auto CAD.
2	Orthographic Projections model 2 Using Auto CAD.
3	Sectional Orthographic Projections model 1 Using Auto CAD.
4	Sectional Orthographic Projections model 2 Using Auto CAD.
5	Sectional Orthographic Projections model 3 Using Auto CAD.
6	Isometric Views model 1 Using Auto CAD.
7	Isometric Views model 2 Using Auto CAD.
8	Isometric Views model 3 Using Auto CAD.
9	Projection of solids (Prism and Pyramid only) model 1 Using Auto CAD.
10	Projection of solids (Prism and Pyramid only) model 2 Using Auto CAD.
11	Layout Planning using AutoCAD for PCB.
12	Layout Planning using AutoCAD for Motherboard.

Minimum eight exercises from the above suggested list covering all the topics or any other experiment based on syllabus will be included, which would help the learner to apply the concept learnt.

Self -Learning Plan:

The subject teacher will identify the self-learning topics and ensure that students develop a deeper understanding of their relevance to industry and society. Further, the details of the self-learning activity, assessment methods, and rubrics will be provided in the self-learning plan of the course.

Evaluation Scheme:

Semester End Examination (A):

Theory:

1. Semester End Examination will be conducted as a practical examination on a computer using AutoCAD. The examination will cover the entire syllabus and will consist of practical drawing tasks based on the prescribed syllabus. The total duration and evaluation will be as per the examination guidelines, with the examination carrying a total of 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

Continuous Assessment (B):

Theory: (Term test: 40 Marks)

1. Assessment consists of two class tests of 15 marks each with self -learning assessment (SLA) of 10 marks. The first-class test (TT1) is to be conducted when approx. 50% syllabus is completed and second-class test (TT2) when rest 50% syllabus is completed.
2. Total duration allotted for writing each of the class tests is 45 mins.
3. The SLA of 10 marks is based on self- learning topics conducted as Assignments, Case study, Report writing, Quiz etc. and the distribution of marks will be as per Self-learning Rubrics designed by the subject teacher.

Laboratory/Tutorial (Term work: 25 Marks)

1. Term work shall consist of Laboratory work & Tutorial work with submission.
2. Batch wise laboratory work/Tutorial work is to be conducted to develop a rational temperament for scientific observations which lead to constructive inferences essential for technology studies. Students must be encouraged to perform minimum eight experiments and submit the laboratory Journal.
3. An additional laboratory/tutorial activity based on self-learning topics in the form of Lab demonstration experiment, Virtual Lab, Simulation Lab, extra tutorial, case study should be conducted and assessed.
4. The distribution of 25 marks for term work should be as per the Rubrics designed for the Laboratory work by the subject teacher.

Books Recommended:

Text books:

- N. D. Bhatt, 'Engineering Drawing', Charotar Publishing House.
- M. B. Shah & B. C. Rana 'Engineering Drawing', Pearson Education.
- Basant Agrawal, C M Agrawal, 'Engineering Drawing',Third Edidtion, Tata McGraw Hill Education Private Limited.

Reference Books:

- K. Venugopal (2007), 'Engineering Drawing and Graphics + AutoCAD', New Age International Publishers.
- M. L. Dabhade (2008), 'Engineering Drawing', Vision Publications.
- Dhananjay A. Jolhe, 'Engineering Drawing with an Introduction to AutoCAD', Tata McGraw Hill Education Private Limited.

Web References:

- Autodesk, AutoCAD Learning Videos – 2D objects, layers, dimensions, layouts and plotting https://www.autodesk.com/solutions/aec/autocad-tutorials.
- Swayam Course: https://onlinecourses.swayam2.ac.in/e-learning/preview/aic22_ts42
- Autodesk, AutoCAD Learning Videos https://www.youtube.com/@autocad/videos.

Program: Electronics and Telecommunication Engineering	First Year B. Tech.	Semester: I
Course: Basic Electrical Engineering and Digital Electronics (D26EES103)		
Course: Basic Electrical Engineering and Digital Electronics Tutorial (D26EES103T)		

Pre-requisites:

1. Knowledge of basic physics
2. Knowledge of basic mathematics

Objectives:

1. To develop basic understanding of concepts of DC and AC circuits and analyse their operations using various techniques.
2. To get an insight of digital electronics.

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

1. Apply Kirchhoff's laws, circuit analysis techniques, and network theorems to analyze and solve DC electrical circuits.
2. Analyze single-phase AC circuits by applying phasor concepts to determine RMS and average values, circuit parameters of R- L-C series, and parallel AC circuits.
3. Apply Boolean algebra and DeMorgan's laws to simplify logic expressions and explain basic digital logic circuits

Basic Electrical Engineering and Digital Electronics (D26EES103)		
Unit	**Description**	**Duration**
1	**DC Circuits** • Introduction to ideal and practical voltage and current sources • Kirchhoff's current and voltage laws • Mesh and Nodal analysis • Supernode and Supermesh analysis	**5**
2	**DC Network Theorems** • Star – Delta Transformation • Superposition Theorem • Thevenin's Theorem • Maximum Power Transfer Theorem	**6**
3	**AC Circuits** • Generation and representation of alternating voltage and currents • RMS and Average value • Phasor representation • AC through resistance, inductance and capacitance • R-L-C series, parallel circuits • Calculation of power and power factor	**10**
4	**Logic Gates** • Basic gates • Universal gates	**4**

	• Boolean algebra • DeMorgan's Laws	
5	**Latches and Flip flops** • Introduction to Latches and Flip-flops • Flip-flops: RS, JK, T, D flip-flops	**3**
	Total	**28**

Basic Electrical Engineering and Digital Electronics Tutorial (D26EES103T) Batchwise minimum 8 tutorial sessions are to be conducted on topics which would help the learner to identify/analyze the problem and to apply problem solving techniques learnt.	
Sr. No	**Topics of Tutorial**
1	Mesh analysis
2	Nodal analysis
3	Supermesh analysis
4	Supernode analysis
5	Star – Delta Transformation
6	Superposition Theorem
7	Thevenin's Theorem
8	Maximum Power Transfer Theorem
9	RMS and Average value
10	Phasor representation, Series R-L, Series R-C
11	Series R-L-C, Parallel R-L-C circuits
12	Logic Gates
13	Latches and Flip-flops

Self -Learning Plan:

The subject teacher will identify the self-learning topics and ensure that students develop a deeper understanding of their relevance to industry and society. Further, the details of the self-learning activity, assessment methods, and rubrics will be provided in the self-learning plan of the course.

Evaluation Scheme:

Semester End Examination (A): ~

Theory:

1. Question paper based on the entire syllabus will comprise of 4 questions (All compulsory, but with internal choice having sub questions as appropriate), total summing up to 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

Continuous Assessment (B):

Theory: (Term test: 40 Marks)

1. Assessment consists of two class tests of 15 marks each with self -learning assessment (SLA) of 10 marks. The first-class test (TT1) is to be conducted when approx. 50% syllabus is completed and second-class test (TT2) when rest 50% syllabus is completed.
2. Total duration allotted for writing each of the class tests is 45 mins.

3. The SLA of 10 marks is based on self- learning topics conducted as Assignments, Case study, Report writing, Quiz etc. and the distribution of marks will be as per Self-learning Rubrics designed by the subject teacher.

Tutorial (Term work: 25 Marks)

1. Term work shall consist of Tutorial work with submission.
2. Batch wise Tutorial work is to be conducted to develop a rational temperament for scientific observations which lead to constructive inferences essential for technology studies. Students must be encouraged to perform minimum eight tutorials and submit the tutorial Journal.
3. An additional tutorial activity based on self-learning topics in the form of Lab demonstration experiment, Virtual Lab, Simulation Lab, Tutorial, case study should be conducted and assessed.
4. The distribution of 25 marks for term work should be as per the Rubrics designed for the Tutorial work by the subject teacher.

Books Recommended:

Textbooks:

- Charles K. Alexander and Matthew N. O. Sadiku, Fundamentals of Electric Circuits, McGraw Hill India, 2022.
- B. R. Patil, Basic Electrical Engineering, Oxford Higher Education, 2016.
- R. R. Singh, Network Analysis and Synthesis, McGraw Hill, 2019.
- R. S. Sedha, A textbook of Electronic Devices and Circuits, S. Chand, 2002.
- R. P. Jain, Modern Digital Electronics, McGraw Hill, 2011.

Reference Books:

- D. P. Kothari and I. J. Nagrath, Basic Electrical Engineering, McGraw Hill, 2010.
- D. C. Kulshreshtha, Basic Electrical Engineering, McGraw Hill, 2009.
- E. Hughes, Electrical and Electronics Technology, Pearson, 2010.
- V. D. Toro, Electrical Engineering Fundamentals, Prentice Hall India, 1989.
- M. Morris Mano, Digital Design, Prentice Hall India, 2017.

Web References:

- Basic Electrical Circuits (https://nptel.ac.in/courses/108106172)
- Fundamentals of Electrical Engineering (https://nptel.ac.in/courses/108105112)

Program: Electronics and Telecommunication Engineering	First Year B. Tech.	Semester: I
Course: Ideation and Innovation Laboratory (D26ESC101L)		GROUP B

Pre-requisites: Nil

Objectives:

1. Provide first-year engineering students with experiential, hands-on learning in electronics, mechanical fabrication, and prototyping.
2. Encourage innovation and problem-solving by integrating ideation, design, and fabrication in practical activities.
3. Develop critical thinking, teamwork, and collaborative learning through hands-on engineering activities

Outcomes: Learners are expected to:

1. Demonstrate the ability to identify and use basic electronic instruments and mechanical tools safely and effectively for measurement and testing purposes.
2. Construct, solder, and house electronic circuits by interpreting schematics and applying fabrication skills for functional prototyping.
3. Design and assemble a wired two-wheeled robotic system with motor controls, demonstrating integration of mechanical and electronic components.

Ideation and Innovations Laboratory (D26ESC101L)		
Unit	**Description**	**Duration**
1	**Project-Based Learning Activity 1: Circuit Simulation** • **Objective:** To introduce learners to circuit simulation techniques enabling them to analyze and verify fundamental electrical circuit theorems. • **Outcome:** 1. Learners explore and demonstrate proficiency in using a circuit simulation tool. 2. They simulate and verify key electrical theorems, including Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL). 3. Learners perform Mesh and Nodal Analysis using simulation-based circuit modeling. 4. They analyze and validate the Maximum Power Transfer Theorem through simulated circuit behavior.	**10**
2	**Project-Based Learning Activity 2: IoT and Android App Development** • **Objective:** To introduce learners to the fundamentals of the Internet of Things (IoT) and Android-based application development. • **Outcome:** 1. Learners explore the IoT-enabled ESP32 module and temperature sensor (eg. IC LM35 / DHT22) by interfacing them and interpreting the displayed results on a hyper terminal.	**10**

	2. They develop an understanding of the open-source Android development platform, MIT App Inventor, by creating a sample app that displays and announces a given message. 3. Learners integrate both functionalities by designing an Android application to display real-time temperature and/or humidity readings on a mobile screen.	
3	**Project-Based Learning Activity 3: DIY (Do-It-Yourself) Project** • **Objective:** To encourage learners to apply their acquired skills by independently identifying and executing a hands-on project that demonstrates their learning from previous activities. • **Outcome:** 1. Learners conceptualize and select a project that integrates multiple skills gained from prior activities. 2. They design, prototype, and implement the project using appropriate tools, components, and techniques. 3. Learners document their process, including observations, calculations, and inferences, to validate their design and functionality. 4. The completed project is evaluated based on creativity, functionality, and adherence to engineering principles.	**08**
	Total	**28**

Self -Learning Plan:

The subject teacher will identify the self-learning topics and ensure that students develop a deeper understanding of their relevance to industry and society. Further, the details of the self-learning activity, assessment methods, and rubrics will be provided in the self-learning plan of the course.

Evaluation Scheme:

Continuous Assessment (B):

Laboratory (Term work: 25 Marks)

1. Term work shall consist of Laboratory work with submission.
2. Batch wise laboratory work/Tutorial work is to be conducted to develop a rational temperament for scientific observations which lead to constructive inferences essential for technology studies. Students must be encouraged to perform minimum six experiments (project based learning activities) and submit the laboratory journal.
3. An additional laboratory/tutorial activity based on self-learning topics in the form of Lab demonstration experiment, Virtual Lab, Simulation Lab, case study should be conducted and assessed.
4. The distribution of 25 marks for term work should be as per the Rubrics designed for the Laboratory work by the subject teacher.

Reference Books:

- Paul Horowitz and Winfield Hill, "The Art of Electronics" Cambridge University Press, 3rd Edition, 2015.
- Paul Scherz and Simon Monk, "Practical Electronics for Inventors" McGraw Hill Education, 4th Edition, 2016.

- Charles K. Alexander and Matthew N. O. Sadiku, "Fundamentals of Electric Circuits" McGraw Hill Education, 4th Edition, 2016.

Online Resources:

- Online repository and community for sharing and exploring 3D-printable designs and open-hardware projects. - https://www.thingiverse.com/
- Step-by-step learning resource for developing Android applications using MIT App Inventor. - http://www.appinventor.org/book2
- Official resource for ESP32 development boards, hardware, software frameworks, documentation and IoT development resources. - https://www.espressif.com/
- Visual, beginner-friendly platform for learning mobile app development through hands-on application building, tutorials and educational resources. - https://appinventor.mit.edu/
- Practical tutorials and project resources for ESP32, ESP8266, Arduino, Raspberry Pi, IoT, web servers and related embedded applications. - https://randomnerdtutorials.com/

Program: Electronics and Telecommunication Engineering	First Year B. Tech.	Semester: I
Course: Health and Wellness (D26ELL101T)		

Pre-requisites: Nil

Objectives:

1. To understand principles of physical, mental, social and spiritual wellness.
2. To understand the significance of digital health.
3. To practice stress management and emotional resilience.
4. To develop healthy lifestyle habits for good health.
5. To impart strategies to solve community or campus health challenges.

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

1. Understand the multidimensional nature of health and its role in engineering careers.
2. Use digital wellness and fitness platforms effectively.
3. Employ personal development (both physical & emotional) strategies for better living.
4. Create a plan for good health through a positive mindset.
5. Design simple digital solutions(posters) to address community or campus health challenges.

Health And Wellness (D26ELL101T)		
Unit	**Description**	**Duration**
1	**Foundations of Health & Wellness** • WHO definition — dimensions of health • Physical, mental, social & spiritual wellness • Health vs. disease continuum • Role of lifestyle in engineering careers	**4**
2	**Digital Health and Wellness** • Introduction to digital health • Telemedicine and e-health systems • Wearable health devices • Fitness trackers and smart watches	**6**
3	**Mental Health and Stress Management** • Stress, anxiety, and burnout • Time management for students • Yoga for mind and body (Mindfulness and Meditation) • Building resilience	**6**
4	**Nutrition and Healthy Lifestyle** • Balanced diet and nutrition basics • Food habits and metabolism • Exercise and fitness principles • Sedentary lifestyle risks for students • Ergonomics & posture at workstations • Hydration & sleep hygiene • Substance abuse awareness	**6**

5	**Community & Environmental Health** • Environmental pollution & health impacts • Sustainable living & green habits • Campus health resources • Social responsibility in public health	**4**
	Total	**26**

Health And Wellness (D26ELL101T)	
Sr. No.	**Tutorial**
1	Fundamentals of Good Health
2	Create a Personalized Health Goal Plan
3	Lifestyle choice (Healthy or Unhealthy) to explore
4	Skit on Health and Disease Prevention
5	Role-play techniques to promote awareness regarding Digital health and disease prevention
6	Yoga Activity For Mind and Body-Mindfulness & Meditation
7	Stress Management-Group Discussion
8	Real-world nutrition design task
9	Mind Management (Case Study)
10	Create a digital awareness poster
11	Nutrition and Healthy Lifestyle
12	Digital journaling for mood tracking
	Mini Project – Community Health and Wellness Initiative
1	**Research and Assess Community Needs:** • Conduct surveys or interviews to assess the health and wellness needs of your community. • Identify specific areas where improvements can be made, such as physical fitness, mental health, social connections, or access to healthcare resources.
2	**Fitness and Recreation Events:** • Arrange fitness events, such as community walks or runs, group exercise classes, yoga sessions, or sports tournaments.
3	**Health Education Campaigns:** • Launch health education campaigns to raise awareness about specific health issues relevant to your community. • This could include distributing informational pamphlets, organizing educational talks, etc. • Creating Social Media Campaigns to share important health messages. Develop a plan to sustain the project beyond its initial phase.
4	**Health and Wellness Advocacy:** • Choose a health issue you are passionate about and design a health and wellness advocacy project. • Students can create a Persuasive Video, Infographic or Social Media Campaign to raise awareness and mobilize support for their chosen cause.

A minimum of eight assignments & a mini-Project from the above-suggested list or any other assignment based on the syllabus will be included, which would help the learner to apply the concept.

Self -Learning Plan:

The subject teacher will identify the self-learning topics and ensure that students develop a deeper understanding of their relevance to industry and society. Further, the details of the self-learning activity, assessment methods, and rubrics will be provided in the self-learning plan of the course.

Evaluation Scheme:

Tutorial (Term work: 50 Marks)

1. Term work shall consist of Tutorial activities (25marks) and Mini Project(15marks).
2. Batch wise Tutorial Activities are to be conducted to develop a deep understanding of Healthy Life which will help the students to apply various aspects of health. Students must be encouraged to perform minimum eight activities and submit the written assignments on it.
3. An additional tutorial activity based on self-learning(10 marks) topics in the form of demonstration, extra tutorial, case study etc. should be conducted and assessed.
4. The distribution of 25 marks for term work should be as per the Rubrics designed for the Tutorial work by the subject teacher.

Reference Books:

- C. Bouchard, S. N. Blair, and W. L. Haskell, Eds., *Physical Activity and Health*. Champaign, IL, USA: Human Kinetics, 2012.
- E. Attached and M. Fernandez, *Mental Health Workbook*, 2021.
- N. Lorick, *Mental Health Workbook for Women: Exercises to Transform Negative Thoughts and Improve Well-Being*, 2022.
- C. Nyambichu and J. Lumiri, *Lifestyle Diseases: Lifestyle Disease Management*, 2018.
- A. Clow and S. Edmunds, *Physical Activity and Mental Health*. Champaign, IL, USA: Human Kinetics, 2013.
- B. K. S. Iyengar, *Yoga for Beginners: A Practical Guide*. London, U.K.: Dorling Kindersley, 2006.
- D. Goleman, *Emotional Intelligence: Why It Can Matter More Than IQ*. New York, NY, USA: Bantam Books, 2006.
- J. Clear, *Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones*. New York, NY, USA: Penguin Books, 2018.
- S. Lin (Ed.), *Digital Health*. Brisbane, Australia: Exon Publications, 2022.
- S. Syed-Abdul, X. Zhu, and L. Fernandez-Luque (Eds.), *Digital Health: Mobile and Wearable Devices for Participatory Health Applications*. Amsterdam, Netherlands: Elsevier, 2020.
- D. Patel (Ed.), *Digital Health: Telemedicine and Beyond*. Cambridge, MA, USA: Academic Press, 2024.
- E. Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*. New York, NY, USA: Basic Books, 2019.
- P. Lee, C. Goldberg, and I. Kohane, *The AI Revolution in Medicine: GPT-4 and Beyond*. New York, NY, USA: Pearson, 2023.

Web References:

- Physiopedia — The Concept of Wellness (dimensions of health vs. wellness) — https://www.physio-pedia.com/The_Concept_of_Wellness
- Thomas Jefferson University — 8 Dimensions of Wellness — https://www.jefferson.edu/life-at-jefferson/health-wellness/fitness/8-dimensions-wellness.html

- Open Medscience — Wearable Devices and Apps in Healthcare (role in telemedicine) — https://openmedscience.com/wearable-devices-and-apps-a-growing-partnership/
- Meegle — Wearable Tech for Telemedicine — https://www.meegle.com/en_us/topics/wearable-technology/wearable-tech-for-telemedicine
- Mindful.org — How to Manage Stress with Mindfulness and Meditation — https://www.mindful.org/how-to-manage-stress-with-mindfulness-and-meditation/
- PMC/NIH — Mindfulness-Based Approaches for Stress, Anxiety & Depression in Health Students — https://pmc.ncbi.nlm.nih.gov/articles/PMC8435111/
- College Ave — Effective Time Management for Students — https://www.collegeave.com/articles/effective-time-management-for-students/
- 8.Harvard T.H. Chan School of Public Health — Healthy Eating Plate — https://nutritionsource.hsph.harvard.edu/healthy-eating-plate/
- Health Discovery — Ergonomics & Nutrition (posture, workstation health) — https://healthdiscovery.org/nutrition/ergonomics-nutrition-combo/
- PMC/NIH — Diet and Sleep Behaviors in Student-Athletes (sleep hygiene study) — https://pmc.ncbi.nlm.nih.gov/articles/PMC12472328/
- 11.PAHO/WHO — Environmental Determinants of Health — https://www.paho.org/en/topics/environmental-determinants-health
- 12. PMC/NIH — Environmental and Health Impacts of Air Pollution: A Review — https://pmc.ncbi.nlm.nih.gov/articles/PMC7044178/
- 13. Frontiers in Public Health — Greening Public Health (embedding sustainability in practice) — https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2026.1888689/full

Program: Electronics and Telecommunication Engineering	First Year B. Tech.	Semester: I
Course: Artificial Intelligence Foundations (D26ESC149)		

Pre-requisites: Basic knowledge of Computer Systems

Objectives:

1. To understand fundamental concepts of Artificial Intelligence, Generative AI, and apply Generative AI tools responsibly.
2. To develop core programming fundamentals in Python to solve computational problems.

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

1. Apply the fundamental concepts, applications, capabilities, and limitations of Artificial Intelligence, Generative AI and apply Generative AI tools responsibly for professional and everyday tasks.
2. Develop basic Python programs using variables, expressions, conditional statements, functions, and loops to solve simple computational problems.

Detailed Syllabus: Artificial Intelligence Foundations (D26ESC149)		
Unit	**Description**	**Duration**
1	**Introduction to Artificial Intelligence, Generative AI and Responsible AI** Introduction to Artificial Intelligence, Generative AI, key AI terminology, Introduction to Generative AI tools such as ChatGPT and Gemini, Fundamentals of prompt engineering, Brainstorming, idea generation, and iterative prompting, AI for everyday productivity: email organization, document summarization, planning, and scheduling, AI as a creativity partner: content generation, storytelling, and creative writing, Introduction to AI image generation and effective image prompting, AI-generated content for personal branding and social media, AI applications for travel planning and everyday activities, Fact-checking and evaluating AI-generated information, Understanding AI hallucinations, accuracy, and reliability, Privacy, sensitive information, plagiarism, and copyright, Understanding bias and responsible use of AI, Developing personal AI toolkits, prompt libraries, and AI workflows, Applying AI to professional and everyday tasks, Building an individual AI learning strategy.	**5**
2	**Introduction to Programming and Python** Why programming; what is a program; computer hardware and software; programming languages; Python as a programming language; basic programming concepts; setting up Python; Python Playground; text editors; running Python programs; programming environment; Python syntax; writing and executing the first Python program; Hello World assignment.	**5**
3	**Variables, Expressions and Input / Output** Elements of Python; constants; reserved words; variables; variable names and assignment; numerical expressions; data types; comments; input-process-output model; basic calculations; user input and output; Welcome Message assignment; Pay Calculator assignment	**4**

4	**Conditional Statements and Decision-Making** Sequential execution; conditional execution; if statements; decision-making; conditional logic; multiple conditions; developing programs using conditional statements; Overtime Pay Calculator assignment	**3**
5	**Functions, Loops and Iteration** Introduction to functions; using and defining functions; parameters and arguments; return values; reusable code; loops and iteration; for loops; definite loops; loop patterns; repetitive processing; finding largest and smallest values; Build Functions assignment**;** Largest and Smallest Numbers assignment	**5**
	Total	**22**

Evaluation Scheme:

Continuous Assessment (B)

1. The identified courses shall focus on developing AI-related competencies and skills among students. Each selected course shall carry one (1) credit.
2. Faculty members shall act as mentors for the Coursera courses identified for various semesters of the program.
3. One faculty mentor shall be assigned to each division of the program for effective coordination and monitoring of this activity.
4. The assigned faculty mentor shall complete and review the course content before assigning the course to students.
5. The term work for these one-credit courses shall form a part of the Internal Continuous Assessment (ICA)component.
6. The Term work (ICA) component shall carry **40 marks**

The distribution of marks for term work shall be as follows:

- **15 Marks**: Coursera Course Completion and Certification
- **15 Marks**: Faculty-curated quiz conducted through the Coursera/Any other platform
- **10 Marks**: Internal faculty evaluation through quizzes, assignments, presentations, or project

Suggested Coursera Mapping

Course Name	Coursera Content Provider	Link
Introduction to AI for Beginners	Skills Booster Academy	https://www.coursera.org/learn/introduction-to-ai-for-beginners
Programming for Everybody (Getting Started with Python)	University of Michigan	https://www.coursera.org/learn/python/