



# **First Year Curriculum**

**Admission Year 2026-27**

**Industry Embedded B.Tech in Computer  
Science and Engineering in Association with  
SAP**

**Faculty of Engineering & Technology**

**Parul University**

**Vadodara, Gujarat, India**

## 1. Detailed Syllabus

## Semester 1

(1)

- a. **Course Name:** Web Designing
- b. **Course Code:** 03010501PC01
- c. **Prerequisite:** Basic computer skills, problem-solving mindset.
- d. **Rationale:** Basic computer skills, HTML, CSS, problem-solving, debugging, interactivity, performance optimization, and user experience are essential for web development.

**e. Course Learning Objective:**

<b>CLOBJ 1</b>	Understand the fundamentals of HTML and CSS for webpage development
<b>CLOBJ 2</b>	Develop forms and multimedia-rich webpages using semantic HTML elements
<b>CLOBJ 3</b>	Apply CSS styling, layouts, Flexbox, and Grid for responsive interfaces.
<b>CLOBJ 4</b>	Understand web deployment concepts, hosting services, and publishing methods.

**f. Course Learning Outcomes:**

<b>CLO 1</b>	Create simple web pages using HTML and CSS.
<b>CLO 2</b>	Design web forms with different input fields.
<b>CLO 3</b>	Apply CSS for styling and layout using Flexbox and Grid.
<b>CLO 4</b>	Build responsive web pages with media queries and animations.
<b>CLO 5</b>	Understand web hosting, domain names, and website deployment.

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
3	-	2	4	20	20	20	60	30	150

**L-** Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination

## h. Course Content:

Sr. No.	Content	Weightage	Teaching Hours
1	Introduction to HTML & CSS Introduction to HTML (History, evolution, What is HTML? Why it is use? )HTML Page Structure with basic HTML tag (Html, Title, Link, Head, Body) Introduction to CSS (What is CSS, Why it is use? , Syntax)Types of CSS (Inline, Internal, External)	11%	6
2	HTML Elements & Forms Headings, Paragraphs, Lists (ordered , unordered, descriptive), and Tables (table, <tr>, <td>, <th> ,<thead>,<tbody>,<tfoot>) Forms and Input Fields (input, label, button, click events, methods, prompt, alert, confirm, radio button , checkbox, text-area, date, select, option, text, email, password, number) HTML5 Semantic Elements (header, footer, navigation, section, article, container, div, aside) Multimedia Elements (Images, Audio, Video)	26%	12
3	CSS Basics & Styling Selectors and Properties (elements, class, id, hover, active) Box Model & Layout Techniques (content, padding, margin, border, height, width, display, visibility, overflow) Colors, Fonts, and Backgrounds (font-family, font-style, font-size, font-weight) CSS Flexbox and Grid (justify-content, align-items, flex-wrap, flex-direction, grid-template-rows, grid-template-columns, gap ) CSS positions and indexes (fixed, absolute, relative, static, z-index)	26%	12
4	Responsive Web Design & Advanced CSS Media Queries for Responsive Design . CSS Transitions and Animations (transition property, duration, timingfunction, delay, animation-name, iteration-count, direction).CSS Variables & Advanced Styling (shadow, gradient, border-radius).Templates (Pre-defined template, How to use it?)	26%	12
5	Introduction to Web Deployment (Theory Only) What is Web Hosting? Domain Names & Hosting Services .Overview of Deployment Methods . How websites are published online. Students learn about web hosting, domain names, DNS, and different deployment methods using platforms like GitHub Pages or Netlify. Basic version control and SEO considerations are also introduced.	11%	6

## i. Text Book and Reference Book:

1. "HTML and CSS: Design and Build Websites" by Jon Duckett
2. JavaScript and JQuery: Interactive Front-End Web Development – Jon Duckett
3. Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics

## j. Experiment List

Sr.NO	Experiment List
1.	1. Create a simple webpage using headings and paragraphs 2. Use <code>&lt;h1&gt;</code> for heading 3. Write at least 3 meaningful paragraphs using the <code>&lt;p&gt;</code> tag
2.	1. Add links and images to a webpage 2. Use the <code>&lt;a&gt;</code> tag to add hyperlinks (external and internal). 3. Use the <code>&lt;img&gt;</code> tag to display an image from your computer or a URL
3.	1. Make lists and tables in HTML 2. Create an ordered list and an unordered list. 3. Design a table with rows and columns using <code>&lt;table&gt;</code> , <code>&lt;tr&gt;</code> , <code>&lt;td&gt;</code> , <code>&lt;th&gt;</code> .
4.	1. Create a registration form 2. Include fields like Name, Email, Gender, Date of Birth, and Submit button. 3. Use appropriate form elements: <code>&lt;input type="text"&gt;</code> , <code>&lt;input type="password"&gt;</code> , etc.
5.	1. Use semantic HTML elements 2. Build a layout using <code>&lt;div&gt;</code> , <code>&lt;h1&gt;</code> , <code>&lt;h2&gt;</code> , and <code>&lt;h3&gt;</code> .
6.	1. Apply CSS styles to HTML elements 2. Use <code>tag</code> , <code>class (className)</code> , and <code>ID (#idName)</code> selectors. 3. Change text color, background color, margins, and padding.
7.	1. Understand and use the box model 2. Apply padding, borders, and margins to elements. 3. Use <code>width</code> and <code>height</code> properties to control size.
8.	1. Create a navigation bar using Flexbox 2. Use CSS Flexbox to arrange menu items horizontally. 3. Add hover effects and spacing between items.
9.	1. Make a responsive layout using CSS Grid 2. Use grid to create a two-column layout. 3. Adjust grid layout for different screen sizes using media queries.
10.	1. Make your webpage work on all screen sizes 2. Use responsive units like <code>%</code> , <code>vw</code> , <code>vh</code> , <code>em</code> , and <code>rem</code> . 3. Use media queries to adapt layout for mobile, tablet, and desktop.
11.	1. Add hover effects and simple animations 2. Use the <code>:hover</code> pseudo-class to style elements on mouse-over. 3. Create a simple animation using <code>@keyframes</code> and <code>transition</code> .
12.	1. Create a simple webpage with internal and external CSS 2. Write internal CSS in <code>&lt;style&gt;</code> tags.
13.	1. Add audio and video to a webpage 2. Use <code>&lt;audio&gt;</code> and <code>&lt;video&gt;</code> tags with controls, autoplay, and loop.
14.	1. Build a simple personal portfolio website 2. Include sections like About Me, Skills, Projects, and Contact. 3. Add navigation and media (images, links, icons).

(2)

- a. **Course Name:** Calculus
- b. **Course Code:** 03019101BS01
- c. **Prerequisite:** Basic concepts of Calculus
- d. **Rationale:** Calculus is the branch of mathematics that deals with continuous change. Calculus is also called infinitesimal calculus or “the calculus of infinitesimals”. The meaning of classical calculus is the study of continuous change of functions. Most of these quantities are the functions of time such as velocity is equal to change in distance with respect to time.
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	Understand the consequences of various mean value theorems and fundamental theorems of calculus.
<b>CLOBJ 2</b>	Apply multivariable calculus techniques for optimization and partial differentiation problems.
<b>CLOBJ 3</b>	Solve problems involving double and triple integration for area and volume calculations.
<b>CLOBJ 4</b>	Analyze line, surface, and volume integrals using vector calculus
<b>CLOBJ 5</b>	Apply Green’s, Gauss’s, and Stokes’ theorems in engineering and mathematical applications.

- f. **Course Learning Outcomes:**

<b>CLO 1</b>	Understand the consequences of various mean value theorems for differentiable functions.
<b>CLO 2</b>	Apply the concept of Multivariate calculus in optimization problems
<b>CLO 3</b>	Apply the concept of multiple integration in problems.
<b>CLO 4</b>	Analyze Inter-relationship amongst the line integral, double and triple integral formulations.
<b>CLO 5</b>	Realize importance of Green, Gauss and Stokes’ theorems in other branches of mathematics.

- g. **Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
4	-	-	4	20	20	-	60	-	100

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

#### **h. Course Content:**

<b>Sr. No.</b>	<b>Topics</b>	<b>Weightage</b>	<b>Teaching Hours</b>
<b>1</b>	<b>Application of Functions of One Variable</b> Review of the function of one variable, limit, continuity, and differentiability, mean value theorems and applications, Riemann integration, fundamental theorem of calculus, application to length, area, volume, and surface area of revolution.	<b>25%</b>	<b>15</b>
<b>2</b>	<b>Multivariate Calculus</b> Functions of several variables, limit and continuity, partial derivatives and differentiability, composite functions, chain rule, implicit functions, Euler's theorem, Taylor's expansion, Jacobian, maxima and minima, method of Lagrange multipliers.	<b>25%</b>	<b>15</b>
<b>3</b>	<b>Multiple Integration</b> Double integration, change of order, change into polar form, application to area and volume.	<b>20%</b>	<b>12</b>
<b>4</b>	<b>Vector Calculus</b> Introduction, reading a character, writing a character, formatted input, formatted output.	<b>30%</b>	<b>18</b>

#### **i. Text Book and Reference Book:**

1. "Calculus and Analytic Geometry, (TextBook) By G. B. Thomas, Jr. and R. L. Finney, | Pearson India.
2. Calculus, By Ron Larson, Bruce Edwards, | Cengage Learning.
3. Calculus: Early Transcendentals, By James Stewart, | Brooks/Cole.
4. Calculus, By Tom M Apostol, | Wiley Publication. Experiment List

(3)

- a. **Course Name:** Electrical and Electronics Engineering
- b. **Course Code:** 03010601ES02
- c. **Prerequisite:** Knowledge of Physics and Mathematics up to 12<sup>th</sup> science level
- d. **Rationale:** The main objective of this subject is introductory treatment of the field of Electrical and Electronics Engineering to the students of various branches of engineering.
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	To master the application of circuit laws and network theorems for solving DC electrical circuits.
<b>CLOBJ 2</b>	To develop the ability to analyze and calculate parameters for single-phase and three-phase AC systems.
<b>CLOBJ 3</b>	To understand BJT operation and determine stability through DC load line and Q-point analysis.
<b>CLOBJ 4</b>	To design regulated power supplies and understand the functional principles of various transducers.

- f. **Course Learning Outcomes:**

<b>CLO 1</b>	Solve basic electrical circuit problems using Ohm's law, Kirchhoff's laws, and network theorems in DC and AC circuits.
<b>CLO 2</b>	Discuss the role and performance characteristics of resistor, capacitor, and inductor in pure R, pure L, and pure C circuits.
<b>CLO 3</b>	Calculate active, reactive, and apparent power using analytical and phasor methods in series RL, RC, and RLC AC circuits.
<b>CLO 4</b>	Analyze the construction and working principle of a transformer under no-load and load conditions
<b>CLO 5</b>	Assess the construction and operation of DC and AC machines under different loading conditions.
<b>CLO 6</b>	Explain the function and application of various electrical components and protective devices in domestic and industrial electrical systems.

- g. **Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
3	-	2	4	20	20	20	60	30	150

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

**h. Course Content:**

Sr. No.	Content	Weightage	Teaching Hours
1	<p><b>DC Circuits</b>            Concepts of Electrical Current, Voltage, Power and Energy. Electrical circuit elements (R, L and C), voltage and current sources, - Ohm's Law and Kirchoff's Laws, simplifications of networks using series and parallel resistance circuits and its examples, star-delta conversions. Superposition, Thevenin's and Norton Theorems.</p>	20%	10
2	<p><b>AC Circuits</b>            Sinusoidal voltages and currents, their mathematical and graphical representation, Concept of instantaneous, peak (maximum), average and R.M.S. values, frequency, cycle, period, peak factor and form factor, phase difference, lagging, leading and in phase quantities and phasor representation. Rectangular and polar representation of phasors, examples based on theory. Analysis with phasor diagrams of R, L, C, R-L, R-C and R-L-C series circuits and it's example. study of parallel R-L, R-C and R-L-C circuit, concept of impedance, admittance, conductance and susceptance in case of above combinations and relevant voltage-current phasor diagrams, Resonance in series and parallel circuits. Q-factor. concept of active, reactive and apparent power and power factor. Concept of three-phase supply and phase sequence. Voltages, currents and power relations in three-phase balanced star-connected loads and delta-connected loads along with phasor diagrams with examples.</p>	30%	13
3	<p><b>Diode and Transistors</b>            Introduction to Ideal Diode, Effect of temperature Ideal diodes, unbiased diode and Forward and reverse bias of Diode. PIV, surge current, Diode as Uncontrolled switch. Rectifiers: Half wave, Full wave, and bridge wave. Ripple factor, PIV rating. Choke and Capacitor input filter rectifiers, Clipper and Clamper circuits, Construction and working of BJT, Characteristics &amp; specifications of BJT (PNP &amp; NPN transistors), Biased and unbiased BJT, Configuration of the transistor, the concept of gain &amp; BW,</p>	30%	12

	Operation of BJT in the cut-off, saturation & active regions (DC analysis), BJT as a switch, Transistor as an amplifier, Voltage divider bias and analysis, VDB load line and Q point.		
<b>4</b>	<b>Voltage Regulators and Transducers</b> Basic series and shunt regulator, Types of voltage regulator IC: Fixed and adjustable positive and negative linear voltage regulator, IC linear fixed voltage regulator (78XX, 79XX,) Linear Adjustable Regulator, DC Regulated Power supply. Introduction of Transducers. Types of Transducers and its applications	<b>20%</b>	<b>10</b>

**i. Text Book and Reference Book:**

1. A textbook of Electrical technology Vol2 by B.L.Theraja | S. Chand Publication (TextBook) By B.L.Theraja | S. Chand Publication
2. Electrical Engineering Fundamentals (Text Book) By V. D. Toro | Prentice Hall India | 2, Pub. Year 198 By V. D. Toro | Prentice Hall India
3. Electrical and Electronics Technology by E. Hughes | Pearson | 10, Pub. Year 2010 By E. Hughes | Pearson
4. Basic Electrical Engineering by D. P. Kothari and I. J. Nagrath, | Tata McGraw Hill | 3, Pub. Year 2010 (TextBook) By D. P. Kothari and I. J. Nagrath | Tata McGraw Hill
5. Basic Electrical Engineering by D. C. Kulshreshtha | McGraw Hill | 1, Pub. Year 2009 By D. C. Kulshreshtha | McGraw Hill
6. Introduction to Electrical Engineering by M.S Sarma, Oxford university press 2001 By M.S Sarma | Oxford university press 2001

<b>Sr. NO.</b>	<b>Experiment List</b>
1	To Study about Various Electrical and Electronics Symbols and demonstrate various measuring instruments used in Basic electrical Engineering laboratory.
2	Verification of superposition theorem with DC source
3	Verification of Thevenin's theorem with DC source.
4	To experimentally investigate the behaviour of a series RLC circuit under AC excitation.
5	Verification of current and voltage relations in three-phase balanced star and delta-connected loads
6	To plot V-I characteristics of the P-N junction diode.
7	To perform half wave rectifier with and without filter
8	To perform full wave rectifier with and without filter
9	To plot and study input-output characteristics of the Common Emitter (CE) configuration of the transistor
10	To perform and observe the response of voltage regulator IC 7805.

(4)

- a. **Course Name:** Programming for Problem Solving
- b. **Course Code:** 03010501ES01
- c. **Prerequisite:** Requires Basic Knowledge of Computer
- d. **Rationale:** This course is design to provide basic ideas of computer programming. This course also makes help to understand programming language. It will help to develop their logical abilities
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	To introduce students to the fundamentals of computer programming and problem-solving techniques using the C programming language.
<b>CLOBJ 2</b>	To develop logical thinking and analytical skills required for solving engineering and computational problems.
<b>CLOBJ 3</b>	To familiarize students with basic programming concepts such as data types, operators, control structures, arrays, strings, functions, pointers, and file handling.
<b>CLOBJ 4</b>	To enable students to design algorithms and implement efficient C programs for various applications.
<b>CLOBJ 5</b>	To develop debugging, testing, and program execution skills for writing error-free programs.
<b>CLOBJ 6</b>	To provide practical knowledge of structured programming and modular programming concepts using user-defined functions and data structures.

**f. Course Learning Outcomes:**

<b>CLO 1</b>	Recognize the computer's basic principles and organizations.
<b>CLO 2</b>	Understand Concepts of Computer Programming Language
<b>CLO 3</b>	Develop the algorithm for solving basic Engineering Problems.
<b>CLO 4</b>	Write, Compile and debug program with C Programming.
<b>CLO 5</b>	Analyse the Solved, Complex Computational Program written in C.

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
3	-	2	4	20	20	20	60	30	150

**L-** Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination

**h. Course Content:**

Sr. No.	Content	Weightage	Teaching Hours
1	<b>Introduction to 'C' Programming</b> What is C language, History of C language, Application areas of C, Features of C language, structure of C Program, execution flow of program, reading a character, writing a character, formatted input, formatted output functions.	10%	8
2	<b>Constants, Variables, Data Types, Operators and Expressions</b> Constants, Variables, Data Types: Character Set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of Variables, Assigning values to variables, typedef, and Defining symbolic constants. Operators and Expression: Introduction to Operators and its types, Evaluation of expressions, Precedence of arithmetic operators, Type conversions in expressions, Operator precedence and associativity.	15%	5
3	<b>Control structures in C</b> Decision Making & branching: Decision making with If & If .. Else statements, If .. Else statements (Nested ... Ladder), The Switch, The break statement & goto statements, The ternary (?) Operator Looping: The while statement, & The Do.. While loop, The FOR loop, Jump within loops – Programs	15%	4
4	<b>Arrays and Strings</b> Arrays: Introduction, One-dimensional array, Two-dimensional array, Concept of Multidimensional arrays. Strings: String declaration, storage, Built-in-string functions.	20%	7
5	<b>User-Defined Functions, Structure and Unions</b> User-Defined Functions: Concepts of user defined functions, prototypes, definition of function, parameters, parameter passing, calling a function, recursive function, Macros, Pre-processing. Structure and Unions: Introduction, Structure definition, declaring and initializing Structure variables, Accessing Structure members, Copying & Comparison of structures, Arrays of structures, Arrays within	20%	10

	structures, Structures within Structures, Structures and functions, Unions.		
<b>6</b>	<b>Pointers, Dynamic memory allocation and File Management in C</b> Pointers: Basics of pointers, pointer to pointer, pointer and array, Pointer to array, array of pointers , functions returning pointers Dynamic memory allocation: Introduction to Dynamic memory allocation, malloc(), calloc(), free(), realloc(). File Management in C: Introduction and standard file handling functions.	<b>20%</b>	<b>8</b>

**i. Text Book and Reference Book:**

1. "Programming in ANSI C (TextBook) By E. Balaguruswamy | Tata McGraw-Hill
2. C Programming: Test Your Skills By Ashok Kamthane
3. Computer Fundamentals By P.K.Sinha and Priti Sinha | BPB Publications | 4th Edition
4. Star C Programming STAR Certification | C Certification Exam
5. Programming with C By Byron Gottfried | Tata McGraw Hill Education
6. C The Complete Reference By Herbert Schildt
7. Let Us C By Yeshavant Kanetkar | BPB Publications

**j. Experiment List:**

<b>Sr. NO.</b>	<b>Experiment List</b>
1	Practical Set 1 (Basics) <ol style="list-style-type: none"> <li>1. Write a program to print HELLO FRIENDS!</li> <li>2. Write a program that reads two nos. from key board and gives their addition, subtraction, multiplication, division and modulo.</li> <li>3. Write a program to calculate area of circle, use <math>\Omega</math> as symbolic constants.</li> <li>4. Write a program to convert days into months and days.</li> <li>5. Write a program which calculates the summation of three digits from the given 3 digit number.</li> <li>6. Write a program to demonstrate enumerates data type.</li> <li>7. Write a program to compute Fahrenheit from centigrade.</li> <li>8. Write a program to calculate simple interest.</li> <li>9. Read the price of item in decimal form e.g. 12.50 and separate Rs and Paise from the given value e.g. 12 rupees and 50 paise</li> </ol>

2	<p>Practical Set 2 (Control Structures)</p> <ol style="list-style-type: none"> <li>1. Write a program to find the largest of the three nos. using Nested-If-Else statement.</li> <li>2. Write a C program to enter a character and to check whether it is a small letter or it is a capital letter or it is a digit or it is a special symbol.</li> <li>3. Write a program to read marks from keyboard and your program should display equivalent grade according to following table. Marks Grade 100-80 Dist 60-79 First Class 35-59 Second Class 0-34 Fail</li> <li>1. Write a program to read marks of a student from keyboard whether the student id pass (if).</li> <li>2. Write a program to find the sum of first N odd numbers.</li> <li>3. Write a program using while loop construct which finds the factorial of a given integer number.</li> <li>4. Write a C program using do...while and for loop constructs to reverse the digits of the number.</li> <li>5. Write a program to demonstrate use of Switch- Break Statement.</li> <li>6. Write a program to find out all the numbers divisible by 5 and 7 between 1 to 100. Check for Armstrong number. A number is Armstrong if sum of cube of every digit is same as the original number. E.g. <math>153=1^3+5^3+3^3=153</math></li> <li>1. Write a program to print the output of bellow series. <math>1!+2!+3!+4!+..... n!</math></li> <li>2. Write a program to print the following outputs using for Loop. (a) 1 (b) * 12 ** 123 *** 1.</li> <li>Write a program to print the following outputs using for Loop. (a) 1 (b) 321 21 21 321 1</li> </ol>
3	<ol style="list-style-type: none"> <li>1. Write a program which sorts 10 numbers into ascending order.</li> <li>2. Write a program to find maximum element from 1-D array.</li> <li>3. Write a program to find number of odd and even elements from the 1-D array.</li> <li>4. Write a program add two 2x2 matrices.</li> <li>5. Write a program to count number of positive, negative and zero elements from 3x3 matrix.</li> <li>6. Write a function for the following operations on string: Copy one string to another Comparing two strings Adding a string to the end of another.</li> <li>1. Write a program to count vowels from a entered String.</li> <li>2. Write a program which finds whether a string is a palindrome or not</li> </ol>
4	<ol style="list-style-type: none"> <li>1. Write a program to find factorial of a number using recursion.</li> <li>2. Write a program that used user defined function Swap ( ) and interchange the value of two variable.</li> <li>3. Write a function to return 1 if the number is prime otherwise return 0.</li> </ol>
5	<p>Practical Set 5 (Structures)</p> <ol style="list-style-type: none"> <li>1. Define a structure type, personal that would contain person name, date of joining and salary.</li> <li>2. Define a structure called cricket that will describe the following information: Player name Team name Batting average</li> </ol>
6	<p>Practical Set 6 (Pointers)</p> <ol style="list-style-type: none"> <li>1. Write a program to add two numbers using pointers.</li> <li>2. Write a program to swap two numbers using pointer</li> </ol>

7	<p>Practical Set 7 (File Management)</p> <ol style="list-style-type: none"><li data-bbox="331 107 1066 141">1. Write a program to illustrate reading files contents.</li><li data-bbox="331 147 1018 181">2. Write a program to illustrate the use of fgets( ).</li></ol>
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(5)

- a. **Course Name:** Principles of Communication Skills
- b. **Course Code:** 03010001HM01
- c. **Prerequisite:** Knowledge of English Language studied till 12th standard
- d. **Rationale:** Basic Communication Skills are essential for all Engineers
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	Understand the fundamental grammatical structures including parts of speech, punctuation, tenses, phrases, clauses, determiners, Quantifiers, sentence types, and basic concepts of phonetics (IPA symbols, speech sounds, stress, and intonation) for accurate and effective language use.
<b>CLOBJ 2</b>	Develop basic reading and listening comprehension skills by using appropriate strategies to understand simple texts and spoken content with improved pronunciation awareness.
<b>CLOBJ 3</b>	Organize and express ideas clearly in written form through picture-based perception activities.
<b>CLOBJ 4</b>	Build confidence and fluency in spoken communication through correct pronunciation practice, meeting and greeting activities, extempore speech, and everyday conversational exercises.
<b>CLOBJ 5</b>	Apply goal-setting and self-reflection techniques to monitor personal language learning progress, pronunciation improvement, and overall communication skills development.

**f. Course Learning Outcomes:**

<b>CLO 1</b>	Enable students to apply essential grammar rules for accurate and effective communication.
<b>CLO 2</b>	Develop ability to construct clear and coherent sentences and paragraphs using varied sentence structures.
<b>CLO 3</b>	Enhance reading and listening comprehension through identification of main ideas, details, and contextual meanings.
<b>CLO 4</b>	Build s confidence in everyday communication using appropriate greetings, expressions, and speaking skills.

<b>CLO 5</b>	Encourage creative and logical thinking through picture perception and extempore activities
<b>CLO 6</b>	Help students set and track realistic personal and academic goals for continuous self-improvement.

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
-	-	2	1			20		30	50

**L-** Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination

**h. Course Content:**

Sr. No.	Content	Weightage	Teaching Hours
1	<b>Parts of Speech, Punctuation</b> Overview of 8 parts of speech Basic punctuation marks and their usage Importance of grammar in writing	10%	4
2	<b>Tenses</b> Types: Present, Past, Future Forms and correct usage Common tense errors	8%	2
3	<b>Phrase and Clauses;</b> Types of Sentences (Structure Wise) Difference between phrases and clauses Classification of Simple, Compound & Complex Interchange of Simple to Compound, Simple to Complex, Compound to Complex	10%	4
4	<b>Picture Perception</b> Observing and interpreting images Building a short story or description Improving vocabulary and creativity	15%	4
5	<b>Paragraph Development Structure:</b> topic sentence, development, conclusion	8%	2
6	<b>Meeting and Greeting (Initiating a conversation) Basic</b>	7%	2

	conversation skills Formal and informal greetings Common phrases for starting interactions		
7	<b>Reading Comprehension (Basic Level)Types –</b> Skimming & Scanning Reading short passages Identifying main ideas and details Answering basic questions	12%	4
8	<b>Listening Comprehension (Basic Level)</b> <b>Listening to short audios/Conversation</b> <b>Understanding and responding to key information</b> <b>Identifying main ideas and details Answering basic</b> <b>questions</b>	8%	2

9	<b>Extempore Speech</b> Speaking on random topics Organizing thoughts quickly Improving fluency and confidence	15%	4
10	<b>Goal Setting and Tracking</b> Setting SMART goals Planning and tracking progress Self- assessment and reflection	7%	2%

**i. Text Book and Reference Book:**

1. English Grammar in Use (TextBook) By Murphy, Raymond | Cambridge University Press, Pub. Year 2019
2. A Practical English Grammar (TextBook) By Thomson & Martinet | Oxford University Press, Pub. Year 1986
3. The St. Martin's Guide to Writing By Rise B. Axelrod & Charles R. | Cooper, Bedford/St. Martin's, Pub. Year 2021
4. Tactics for Listening (Basic) By Jack C. Richards | Oxford University Press, Pub. Year 2011
5. Active Skills for Reading: Book 1 By Neil J. Anderson | Cengage Learning, Pub. Year 2013
6. Speak with Impact By Allison Shapira | HarperCollins Leadership, Pub. Year 2018.

**(6)**

- a. **Course Name:** SAP S/4 HANA Introduction
- b. **Course Code:** 03015701PC01
- c. **Prerequisite:** Basic knowledge about computer applications | 03015701PC01 - SAP S/4 HANA Introduction
- d. **Rationale:** To introduce the foundational three-tier architecture (database, application, user interface) through SAP S/4 HANA's framework. The aim is to help learners understand SAP's in-memory ERP system, navigation tools, system concepts, integration, and analytics, preparing them for roles like SAP Application Consultant or Business Analyst.
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	Explain the key features, benefits, simplified data model, and evolution of SAP S/4HANA, and demonstrate confident navigation using both SAP GUI and SAP Fiori Launchpad.
<b>CLOBJ 2</b>	Describe the system-wide organizational elements and effectively create & maintain core master data (Business Partner and Material Master) required for logistics processes.
<b>CLOBJ 3</b>	Perform the complete Procure-to-Pay cycle including Purchase Requisition, Purchase Order, Goods Receipt, and Invoice Verification in SAP S/4HANA.
<b>CLOBJ 4</b>	Carry out core logistics processes – Demand Planning, MRP, Production Execution, Sales Order to Billing – and understand their integration with Finance.
<b>CLOBJ 5</b>	Integrate logistics processes with each other and with Financial Accounting, while applying best practices for master data consistency and system navigation in a real business scenario.

**f. Course Learning Outcomes:**

<b>CLO 1</b>	Explain how SAP S/4HANA enables digital transformation and innovation.
<b>CLO 2</b>	Navigate the system using SAP Fiori UX, Business Client, and traditional GUI.
<b>CLO 3</b>	Describe system-wide organizational structures and master data concepts..
<b>CLO 4</b>	Outline core logistics processes, including Purchase-to-Pay, Plan-to-Produce, and Order-to-Cash.
<b>CLO 5</b>	Discuss integration with SAP SuccessFactors and HCM modules
<b>CLO 6</b>	Understand SAP's service offerings and deployment models including cloud, on-premise, and hybrid..

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
3	-	2	4	20	20	20	60	30	150

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

**h. Course Content:**

Sr. No.	Content	Weightage	Teaching Hours
1	<b>SAP S/4HANA Overview and Navigation</b> SAP S/4HANA key values; Simplified data model; Role in digital transformation; Evolution from SAP ECC to S/4HANA; Introduction to SAP GUI Logon; SAP Business Client fundamentals; SAP Fiori UX concepts; Tiles, groups, and catalogs in Fiori; Personalization in Fiori launchpad; Navigation between apps using SAP Fiori.	20%	5
2	<b>System-Wid Concepts and Master</b> Data Organizational elements across SAP modules; Client, Company Code, Plant, Storage Location definitions; Business Partner master data structure; Creation and maintenance of business partner roles; Material master data attributes; Material types and views; Master data integration across modules.	15%	5
3	<b>Core Business Processes in Logistics</b> Procure-to-Pay process flow; Purchase requisition and purchase order processing; Goods receipt and invoice verification; Plan-to-Produce cycle; Demand planning and material requirement planning (MRP); Production orders and confirmations; Order-to-Cash steps; Sales order creation, delivery, billing, and payment; Logistics integration with finance and controlling.	20%	10
4	<b>Accounting and Human Capital Management</b> Accounts payable and accounts receivable; Asset accounting overview; Management Accounting (CO) overview; Cost centers and internal orders; Basics of SAP Human Capital Management (HCM); Employee master data; Organizational structure setup; Overview of SAP SuccessFactors; Integration between cloud HR and SAP Core HCM	20%	10
5	<b>Analytics, Implementation, and SAP Services</b> SAP Embedded Analytics introduction; Real-time operational reporting; Key Performance Indicators (KPIs) and Fiori Analytical Apps; SAP Activate methodology; Phases of SAP Activate (Discover, Prepare, Explore, Realize, Deploy, Run); Fit-to-standard approach; Best practice content and configuration; SAP support models; SAP Cloud and onpremise services; SAP deployment and licensing options.	25%	15

**i. Text Book and Reference Book:**

1. S4H00 – SAP S/4HANA Overview in SAP Learning Hub

**j. Experiment List:**

<b>Sr. NO.</b>	<b>Experiment List</b>
1	Log in to SAP S/4HANA using SAP Fiori Launchpad and personalize the home screen.
2	Navigate through SAP GUI and SAP Business Client to access core modules.
3	Create a Business Partner with multiple roles including customer and vendor.
4	Maintain material master data with appropriate organizational views.
5	Execute a complete Purchase-to-Pay cycle using standard SAP transactions.
6	Simulate the Order-to-Cash process from sales order to invoice.
7	Post a journal entry and display account balances in SAP FI.
8	Create and assign a cost center, then post an internal transaction in SAP CO.
9	Access and interpret real-time reports using SAP Embedded Analytics
10	Explore SAP Activate methodology phases in a sample implementation roadmap

## Semester 2

(1)

- a. **Course Name:** Linear Algebra
- b. **Course Code:** 03019102BS01
- c. **Prerequisite:** Basic Knowledge of Matrix and Determinants
- d. **Rationale:** To attain the knowledge of Matrices and apply to the engineering field to check the consistency of the system. The concept of vector space helps to understand programming in field of computer engg.

e. **Course Learning Objective:**

<b>CLOBJ 1</b>	Understand the fundamental concepts of matrices, systems of linear equations, and matrix decomposition techniques.
<b>CLOBJ 2</b>	Analyze eigenvalues, eigenvectors, diagonalization, and Cayley-Hamilton theorem for solving mathematical problems.
<b>CLOBJ 3</b>	Develop understanding of vector spaces, subspaces, basis, dimension, and linear dependence concepts.
<b>CLOBJ 4</b>	Apply linear transformations, rank-nullity theorem, and matrix representations in mathematical and engineering applications.
<b>CLOBJ 5</b>	Construct orthogonal and orthonormal bases using inner product spaces and Gram-Schmidt orthogonalization process.
<b>CLOBJ 6</b>	Apply linear algebra concepts in coding-decoding, data analysis, and computational applications such as Principal Component Analysis (PCA).

f. **Course Learning Outcomes:**

<b>CLO 1</b>	Understand system of linear algebraic equation and solution techniques using matrix.
<b>CLO 2</b>	Exhibit the understanding of vector space and subspace and solve related problems.
<b>CLO 3</b>	Compute eigenvalues and eigenvectors and diagonalize the matrix
<b>CLO 4</b>	Create orthogonal and orthonormal bases: Gram-Schmidt process and use bases and orthonormal bases to solve application problem.

g. **Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
4	-	-	4	20	20	-	60	-	100

**L-** Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination.

#### h. Text Book and Reference Book:

1. Elementary Linear Algebra with Applications, (TextBook) By H. Anton | John Wiley
2. Linear Algebra and Its Applications By G. Strang | Brooks/Cole India
3. Advanced Engineering Mathematics By Erwin Kreyszig | Willey India Education
4. Linear Algebra, By K. Hoffman and R. Kunze, | Prentice Hall
5. Calculus By T.M. Apostol | John Wiley Publication | Vol. II 6. Linear Algebra: A Modern Introduction, By D. Poole, | 2nd Edition, Brooks/Cole

#### I Course Content

Sr. No.	Content	Weightage	Teaching Hours
1.	<b>Matrices</b> Introduction, System of linear equations (Homogeneous and Nonhomogeneous systems) by Gauss Elimination, and LU Decomposition Method, Rank, Eigenvalues and Eigenvectors, Algebraic and Geometric Multiplicity, Diagonalization, Cayley-Hamilton theorem and Applications-coding-decoding, Principal Component Analysis (PCA).	35%	21%
2.	<b>Vector Space</b> Vector spaces over the field of real numbers, Elementary Properties of Vector Spaces, Subspaces, Spanning set, Linear independence and dependence, Basis and Dimension.	20%	12%
3.	<b>Linear Transformation</b> Definition of Linear Transformation from $R^n$ to $R^m$ Some Standard Linear Transformation, The Null Space & Column Space, The Rank-Nullity Theorem, Matrix of Linear Transformation.	25%	15%
4	<b>Inner Product Spaces</b> Inner-product spaces, norm and its properties, angle between two vectors, orthogonal vectors, orthonormal vector, Gram-Schmidt process, orthonormal basis.	20%	12%

(2)

- a. **Course Name:** Physics for Semiconductors
- b. **Course Code:** 03019201BS01
- c. **Prerequisite:** Knowledge of Physics and some basic concepts in Mathematics like differentiation, integration, limit, differential equation, vector calculus up to 12th science level.
- d. **Rationale:** Knowledge of physics is essential for all Engineering branch because physics is the foundation subject of all the branches of engineering and it develops scientific temperament and analytical capability of engineering students. Comprehension of basic physics concepts enables the students to solve engineering problem logically and develop scientific approach.
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	Understand semiconductor materials using band theory concepts.
<b>CLOBJ 2</b>	Explain principles of optoelectronic devices and optical fibers.
<b>CLOBJ 3</b>	Understand the fundamentals of quantum mechanics and quantum computing.
<b>CLOBJ 4</b>	Analyze low-dimensional and nanomaterials with their applications.
<b>CLOBJ 5</b>	Develop knowledge of semiconductor-based modern technologies.

f. **Course Learning Outcomes:**

<b>CLO 1</b>	To conceptualize semiconducting materials on the basis of band theory.
<b>CLO 2</b>	To get familiar with optical fibres and semiconductor based optoelectronic devices useful in fibre optic system.
<b>CLO 3</b>	To conceptualize the foundational principles of quantum Physics and their role in quantum computing.
<b>CLO 4</b>	Formulate and conceptualize various theoretical aspects and the physical phenomena at Low dimensional level (nano)

g. **Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
3	-	2	4	20	20	20	60	30	150

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE-

Continuous Evaluation, **ESE**- End Semester Examination

**h. Course Content:**

<b>Sr. No.</b>	<b>Content</b>	<b>Weightage</b>	<b>Teaching Hours</b>
<b>1</b>	<b>Band theory&amp; Semiconductors</b> Band structure of solid materials, E-k diagram, Direct and Indirect band gap, Effective mass, Concept of Fermi Energy, Density of state, Fermi Level in Intrinsic and Extrinsic Semiconductors, Ohmic and Schottky Junction	<b>25%</b>	<b>11</b>
<b>2</b>	<b>Optoelectronics</b> Interaction of radiation with Matter, Absorption, Spontaneous and Stimulated emission, Characteristics of Lasers, Diode Laser, LED, Photodiode and their applications. Principle and Structure of Optical Fiber, Numerical Aperture of fiber, Types of Optical Fibers, Attenuation in Optical Fibers, Applications of Optical Fibers.	<b>25%</b>	<b>11</b>
<b>3</b>	<b>Quantum Mechanics &amp; Quantum Computing</b> Quantum postulates, wave function, Schrodinger's equation time dependent, independent (No derivation), One dimensional potential well, quantum tunneling and its application in soft computing Key Principles of Quantum Computing, Difference between classical and quantum computing, Quantum Computing advantages Challenges and Application.	<b>30%</b>	<b>13</b>
<b>4</b>	<b>Low Dimensional Materials</b> Basic characteristic including synthesis, properties, quantum confinement, classification: Quantum Dot, Quantum well , Quantum Wire and their applications, Novel Materials and their applications	<b>20%</b>	<b>10</b>

**i. Text Book and Reference Book:**

1. "Physics of Semiconductor Devices (TextBook) By S. M. Sze and K. N. Kwok | John Wiley & Sons
2. Semiconductor Optoelectronic Devices By P. Bhattacharya | Prentice Hall of India, Pub. Year 1997
3. Engineering Physics (TextBook) By B.K.Pandey S Chaturvedi and M. Venkanna | - Cengage Publication
4. Semiconductor Optoelectronics (TextBook) By J. Singh | McGraw-Hill Inc, Pub. Year 1995
5. "Engineering Mechanics", J.L. Meriam, and L.G.Kraige; John Wiley and sons, New York Signals and Systems" by Simon Haykin and Barry Van Veen.

**j. Experiment List:**

Exp. No.	Name of the Experiment
1	I-V characteristics of light emitting diode in forward bias.
2	I-V characteristics of Zener diode in reverse bias.
3	Determination of Velocity of ultrasonic waves in water.
4	Determination of Dielectric constants of Dielectric samples.
5	Measurement of Band gap of semiconductor material.
6	Measurement of Hall coefficient and carrier concentration in semiconductor material.
7	Measurement of Planck's constant using LED.
8	Measurement of wavelength of laser light using diffraction grating.
9	Measurement of Numerical aperture of an optical Fiber.
10	Determination of the size of lycopodium powder particles.
11	Measurement of power loss in an optical fibre.
12	Moment of Inertia of a flywheel.
13	Young's Modulus by bending of beam.

(3)

- a. **Course Name:** Objected Oriented Programming with Java
- b. **Course Code:** 03010502ES01
- c. **Prerequisite:** strong foundation in programming and object oriented concepts.
- d. **Rationale:** OOP in C++ provides a structured approach to programming by enabling encapsulation, inheritance, polymorphism, and abstraction. It enhances code reusability, maintainability, security, and scalability, making it a preferred choice for building largescale software applications
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	Understand the fundamental principles of Object-Oriented Programming and differentiate it from procedural programming.
<b>CLOBJ 2</b>	Apply core C++ concepts including classes, objects, functions, constructors, and destructors.
<b>CLOBJ 3</b>	Implement various types of inheritance and use function overriding and virtual functions for achieving polymorphism.
<b>CLOBJ 4</b>	Use pointers, virtual functions, and the 'this' pointer effectively in object-oriented design.
<b>CLOBJ 5</b>	Develop modular and reusable code using features like function overloading, friend functions, inline functions, and access specifiers.
<b>CLOBJ 6</b>	Design and implement real-world applications using object-oriented programming concepts in C++.

f. **Course Learning Outcomes:**

<b>CLO 1</b>	Perform various Program of functions in C++.
<b>CLO 2</b>	Perform class and object concept of program.
<b>CLO 3</b>	Apply constructors and destructors for object initialization and cleanup.
<b>CLO 4</b>	Demonstrate various inheritance types and function overriding.
<b>CLO 5</b>	Utilize pointers and virtual functions for dynamic behaviors.

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
2	0	2	3	20	20	20	60	30	150

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

**h. Course Content:**

Sr. No.	Content	Weightage	Teaching Hours
1	<b>Principles of Object Oriented Programming</b> Object Oriented Languages, Applications of Object Oriented Programming, C++ Concepts, Structure of C++ program, Basic Data types in C++, User defined Data types, Derived Data types, Declaration of variables and Dynamic initialization of variables, Reference variables, Operators in C++, Scope Resolution Operators, Differentiate OOP and POP, Access Specifiers: Public, Private, Protected	25%	5
2	<b>Functions, Class and Objects</b> Concept of Functions in C++, Function prototyping, Function Defining, Function Calling, Inline Function, Default Arguments, Constant Arguments, Function Overloading, Defining Class and Creating Objects, Defining Member function, Nesting of Member functions, Private Member functions, Friend function	25%	6
3	<b>Constructor and Destructor</b> Constructor, Types of Constructor: Default Constructor, Parameterized Constructor, Copy Constructor, Destructor	20%	6

<b>4</b>	<b>Inheritance</b> Inheritance , Defining Derived Classes, Types of Inheritance : Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hybrid Inheritance, Function Overriding,Function Overloading vs. Function Overriding,Virtual Base Class , Abstract Classes.	<b>20%</b>	<b>6</b>
<b>5</b>	<b>Pointer &amp; Virtual Functions</b> Pointers to objects,Pointer to Derived Classes , Virtual Functions, Pointer to Virtual Functions, 'this' Pointer.	<b>10%</b>	<b>6</b>

**i. Text Book and Reference Book:**

1. "Object Oriented programming with C++ (TextBook) By E. Balagurusamy | TMH
2. The Complete Reference C++, (TextBook) By by Herbert Schildt | TMH
3. Object Oriented Programming with ANSI and Turbo C++ By Ashok Kamthane | Pearson

**j. Experiment List:**

Sr. NO.	Experiment List
1.	Write a program to Display Hello World on your Output Screen in C++.
2.	Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
3.	Write a C++ Program to generate first n terms of Fibonacci sequence.
4.	Write a program for recursive function.
5.	Write a C++ program to find both the largest and smallest number in a list of integers.
6.	Write a C++ Program to take two values from the user side and perform all kinds of Arithmetic Operation.
7.	Write a C++ program to sort a list of numbers in ascending order.
8.	Write a program to check Given Number is Even or Odd Using if-else in C++.
9.	Write a Program that shows the use of call by reference and Call by Value in C++.
10.	Write a Program to Demonstrate Friend Function and Friend Class.
11.	Write a Program to show the use of Inline Function.
12.	Create a Class named as "STUDENT", Create two data members of that class:sid, smarks and Take two member Function of that class i.e.:GetData() to get the value of data member and ShowData() to Display the value of data members and call that function from the main function.
13.	Create a Class named as "EMPLOYEE", Declare Three Data Members i.e.: eid,ename and e-salary and create two member functions of that class i.e.: GetDetails() to get the input of all the datamembers and PrintDetails() to Display all the details of the Employee. (note: create eid of int datatype, e-name is of char array data type and e-

	salary is of float data type.
14.	Write a Program to show the use of Function Overloading.
15.	Write a Program to show the use of Single level inheritance.
16.	Write a Program to show the use of multilevel inheritance.
17.	Write a Program to show the use of multiple inheritance.
18.	Write a Program to show the use of Hybrid inheritance.
19.	Write a Program to show the use of Virtual Base Class.
20.	Write a Program to show the use of a Default Constructor.
21.	Write a Program to show the use of a Parameterized Constructor.
22.	Write a Program to show the use of a Copy Constructor.
23.	Write a Program to show the use of 'this' pointer.
24.	Develop a program using pointers to derived classes.

**(4)**

- a. **Course Name:** Advanced Communication and Interpersonal Skills
- b. **Course Code:** 03010002HM01
- c. **Prerequisite:** Basic Communication Skills are essential for all Engineers
- d. **Rationale:** Strengthen core language and soft skills through applied grammar, communication tasks, and vocabulary building.

**e. Course Learning Objective:**

<b>CLOBJ 1</b>	Apply core grammatical principles including subject–verb agreement, reported speech, and active–passive voice to improve accuracy in spoken and written communication.
<b>CLOBJ 2</b>	Expand functional vocabulary and language usage by applying synonyms, antonyms, homonyms, idioms, and contextual word meanings effectively.
<b>CLOBJ 3</b>	Develop effective reading comprehension skills to understand, interpret, and respond to intermediate-level texts and spoken content.
<b>CLOBJ 4</b>	Enhance written and spoken expression through structured essay writing, Paragraph development, confident self-introduction, and professional grooming practices.
<b>CLOBJ 5</b>	Develop self-management and personal development skills by applying SWOT analysis, practicing effective time management strategies, and engaging in reflective learning processes.

**f. Course Learning Outcomes:**

<b>CLO 1</b>	Remember the essential rules of English grammar and core vocabulary required for accurate communication.
<b>CLO 2</b>	Understand spoken and written texts at an intermediate level to grasp meaning, ideas, and context.
<b>CLO 3</b>	Apply grammatical structures, vocabulary, and writing skills in essays, self-introductions, and everyday communication.
<b>CLO 4</b>	Analyze personal strengths and weaknesses through SWOT analysis to enhance grooming and personality development.
<b>CLO 5</b>	Analyze communication habits and daily routines to improve time management and professional effectiveness.

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
1	-	2	2	40		20	60	30	150

**L-** Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination

#### h. Course Content:

Sr. No.	Content	Weightage	Teaching Hours
1	<b>Subject Verb Agreement</b> Rules of subject-verb matching Singular vs plural forms Common agreement errors	10%	1
2	<b>Reported Speech</b> Direct and indirect speech Changing tenses, pronouns, and time expressions Reporting statements, questions, and commands	10%	1
3	<b>Active and Passive Voice</b> Difference between Active and Passive Rules for converting sentences Usage in real-life contexts	10%	1
4	<b>Building Vocabulary</b> Word meanings and usage Synonyms and antonyms Homonyms, Homophones, Homographs, Idioms	10%	2
5	<b>Grooming and Personality Development</b> Importance of dressing and professional etiquette Building confidence and positive body language	10%	2
6	<b>SWOT Analysis with Self Introduction</b> Identifying strengths, weaknesses, opportunities, threats Preparing and delivering a confident self-introduction Developing self-awareness and a growth mindset	10%	2
7	<b>Reading Comprehension (Intermediate Level)</b> Understanding written texts Finding main ideas and supporting details Answering questions accurately	10%	2
8	<b>Listening Comprehension (Intermediate Level)</b> Listening for specific information Identifying tone and purpose Responding appropriately	10%	1

<b>9</b>	<b>Essay Writing</b> Structure of an essay: introduction, body, conclusion Organizing ideas logically Using appropriate language and tone	<b>10%</b>	<b>2</b>
<b>10</b>	<b>Time Management</b> Importance of managing time Prioritization Creating schedules	<b>10%</b>	<b>1</b>

**i. Text Book and Reference Book:**

1. Technical Communication: Principles And Practice By Sangeetha Sharma, Meenakshi Raman | Oxford University Press | 2nd Edition
2. Personality Development and Soft Skills By Barun K Mitra | Oxford, 2011
3. High School English Grammar and Composition By Wren & Martin | S. Chand Publishing, Pub. Year 2017
4. English Grammar in Use By Raymond Murphy | Cambridge University Press, Pub. Year 2019
5. Communication Skills and Soft Skills By Suresh Kumar | Pearson Publication, 2010

**Experiment List:**

<b>Sr. NO.</b>	<b>Experiment List</b>
1	Subject Verb Agreement a. Fill-in-the-blank exercises b. Sentence correction tasks c. Group quiz competition d. Role-play using correct subject-verb forms
2	Reported Speech a. Dialogue conversion practice b. Pair work: narrate a conversation c. Reporting classroom news d. Role-play followed by reporting
3	Active and Passive Voice a. Transform active sentences to passive and vice versa b. Rewrite instructions in passive voice c. Classroom narration using passive structures d. Group activity: change story voice
4	Building Vocabulary a. Daily word journal b. Vocabulary flashcards and games c. Synonym-antonym match-up d. Word building through storytelling
5	Grooming and Personality Development a. Personal grooming checklist task b. Group discussion on personality traits c. Mock social interaction d. Confidence-building exercises
6	SWOT Analysis with Self Introduction a. SWOT worksheet filling b. Self-introduction in pairs or groups c. Strength-sharing circle d. Feedback on introductions
7	Reading Comprehension (Intermediate Level) a. Reading passage followed by Q&A b. Find-the-theme activity c. Vocabulary hunt from the passage d. Summarizing a short

	text
8	Listening Comprehension (Intermediate Level) a. Listen and answer exercises b. Listening and completing notes c. Audio- based MCQs d. Paraphrasing what was heard
9	Essay Writing a. Brainstorming and outline creation b. Writing on guided topics c. Peer feedback session d. Editing and final draft submission
10	Time Management and Team Building a. Create a weekly schedule b. Prioritization task (urgent vs important) c. Reflection on time use habits

(5)

- a. **Course Name:** Environmental Science
- b. **Course Code:** 03010002MC01
- c. **Prerequisite:** Knowledge of Physics, Chemistry and Mathematics up to 12th science level and Biology up to 10th science level
- d. **Rationale:** The proposed syllabus of Environmental Science is comprehensive and multidisciplinary, reflecting the interconnectedness of ecological systems, technological development, human behavior, and urban planning. This rationale explains the relevance and importance of each thematic area covered: Environmental Health, Ecology, and Quality of Life; Pollution Prevention; Population Growth and Global Environmental Challenges; Environmental Information Systems and Technological Tools; Smart Cities
- e. **Course Learning Objective:**

<b>CLOBJ 1</b>	Understand the fundamentals of Environmental Science and the interaction between humans and the environment.
<b>CLOBJ 2</b>	Explain various types of environmental pollution, their impacts, and pollution control techniques.
<b>CLOBJ 3</b>	Explain various types of environmental pollution, their impacts, and pollution control techniques.
<b>CLOBJ 4</b>	Analyze contemporary environmental issues and sustainable development practices.
<b>CLOBJ 5</b>	Understand the concept of climate resilient cities and sustainable urban planning

**f. Course Learning Outcomes:**

<b>CLO 1</b>	Analyze the impact of human activities on environmental sustainability and ecosystems.
<b>CLO 2</b>	Promote awareness about biodiversity conservation and its importance for ecological balance.
<b>CLO 3</b>	Assess the effects of pollution and propose strategies for pollution control and waste management.
<b>CLO 4</b>	Describe the significance of climate change and its global implications on ecosystems and human life.
<b>CLO 5</b>	Develop skills to evaluate and mitigate environmental risks in industrial and urban development.

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
1	-	-	0	-	50	-	-	-	50

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

**h. Course Content:**

Sr. No.	Content	Weightage	Teaching Hours
1	<p><b>FUNDAMENTALS OF ENVIRONMENTAL SCIENCE</b>                      Definition, Principles and Scope of Environmental Science. Structure and composition of atmosphere, hydrosphere, lithosphere and biosphere. Laws of thermodynamics, heat transfer processes, mass and energy transfer across various interfaces, material balance. Meteorological parameters - pressure, temperature, precipitation, humidity, radiation and wind velocity. Interaction between Earth, Man and Environment.                      Biogeographic provinces of the world and agro-climatic zones of India. Concept of sustainable development goals. Environmental education and awareness. Environmental ethics.</p>	15%	3
2	<p><b>ENVIRONMENTAL POLLUTION AND CONTROL</b>                      Air, Noise, Water, Soil, Thermal, Marine, and Radioactive pollution, focusing on sources, types of pollutants, and their impacts on human health, plants, and materials. It includes the measurement techniques and standards for air and water quality, along with pollution control devices and methods. Key topics include criteria air pollutants, noise indices, wastewater treatment, and soil pollution management.</p>	25%	4
3	<p><b>ENVIRONMENT MANAGEMENT AND LEGISLATION</b>                      Overview of Environmental Laws in India: Constitutional provisions in India (Article 48A and 51A), Forest Conservation Act, 1980, Water (Prevention and Control of Pollution) Act, 1974 amended 1988 and Rules 1975, Air (Prevention and Control of Pollution) Act, 1981 amended 1987 and Rules 1982, Environmental (Protection) Act, 1986 and Rules 1986, The Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016, The Solid Waste Management Rules, 2016, , Noise Pollution (Regulation 8 and Control) Rules, 2000, Environmental Conventions and Agreements: Stockholm Conference on Human Environment 1972, Montreal</p>	25%	3

	Protocol, 1987, Basel Convention (1989, 1992), Earth Summit at Rio de Janeiro, 1992, Agenda-21, Global Environmental Facility (GEF), Convention on Biodiversity (1992), UNFCCC, Kyoto Protocol, 1997, Clean Development Mechanism (CDM), Copenhagen Summit, 2009.		
<b>4</b>	<p><b>CONTEMPORARY ENVIRONMENTAL ISSUES</b></p> <p>Current Environmental Issues in India: Environmental issues related to water resource projects - Narmada dam, Tehri dam etc., Hydro-power projects in Jammu &amp; Kashmir etc.. Water conservation-development of watersheds, Rain water harvesting and ground water recharge. National river conservation plan – Namami Gange and Yamuna Action Plan. Eutrophication and restoration of lakes. Conservation of wetlands, Ramsar sites in India. Climate change - adaptability, energy security, food security and sustainability. Wild life conservation projects: Project tiger, Project Elephant etc., Carbon sequestration and carbon credits. Waste Management – Swachha Bharat Abhiyan. Sustainable Habitat: Green Building, GRIHA Rating Norms. Vehicular emission norms in India. Epidemiological Issues: Fluorosis, Arsenocosis, Goitre, Dengue. Environmental Disasters: Minnamata Disaster, Love Canal Disaster, Bhopal Gas Disaster, 1984</p>	<b>15%</b>	<b>3</b>
<b>5</b>	<p><b>CLIMATE RESILIENT CITY</b></p> <p>Introduction to Climate Resilience – Understanding the need for cities to adapt to climate change. Impact of Climate Change on Cities – Urban heat islands, flooding, pollution, and infrastructure challenges. Sustainable Urban Planning – Role of green spaces, energy-efficient buildings, and smart city concepts. Green Infrastructure – Importance of urban forests, permeable surfaces, and nature-based solutions. Case Studies and Future Trends – Learning from cities like Singapore, Rotterdam, and Copenhagen.</p>	<b>20%</b>	<b>2</b>

**i. Text Book and Reference Book:**

1. Textbook of Environmental Studies for Undergraduate Courses' (TextBook) By Erach Bharucha | Universities press
2. 3. Basics of Environmental Studies By U K Khare | Tata McGraw Hi
3. 4. Environmental Studies (TextBook) By Anindita Basak | Drling Kindersley(India)Pvt. Ltd Pearson
4. Environmental Sciences By Daniel B Botkin & Edward A Keller | John Wiley & Sons
5. Air Pollution By M. N. Rao and H. V. N. Rao; | Tata McGraw-Hill Publishing Company
6. 10. Environmental Engineering By Howard S. Peavy, Donald R. Rowe, George Tchobanoglous | McGraw-Hill

**(6)**

- a. Course Name:** Business processes in SAP S/4HANA
- b. Course Code:** 03015702PC01
- c. Prerequisite:** Basic understanding of business operations in areas like sales, procurement, production, and finance. Familiarity with enterprise software or ERP concepts is beneficial, though not mandatory.
- d. Rationale:** This course provides a broad overview of core business processes in SAP S/4HANA across various functional areas such as finance, procurement, manufacturing, sales, and more. It enables students to understand how SAP S/4HANA supports and integrates these business processes
- e. Course Learning Objective:**

<b>CLOBJ 1</b>	Explain the key features, benefits, simplified data model, and evolution of SAP S/4HANA, and demonstrate confident navigation using both SAP GUI and SAP Fiori Launchpad.
<b>CLOBJ 2</b>	Describe the system-wide organizational elements and effectively create & maintain core master data (Business Partner and Material Master) required for logistics processes.
<b>CLOBJ 3</b>	Perform the complete Procure-to-Pay cycle including Purchase Requisition, Purchase Order, Goods Receipt, and Invoice Verification in SAP S/4HANA.
<b>CLOBJ 4</b>	Carry out core logistics processes – Demand Planning, MRP, Production Execution, Sales Order to Billing – and understand their integration with Finance.
<b>CLOBJ 5</b>	Integrate logistics processes with each other and with Financial Accounting, while applying best practices for master data consistency and system navigation in a real business scenario.

**f. Course Learning Outcomes:**

<b>CLO 1</b>	Understand the core business processes supported by SAP S/4HANA.
<b>CLO 2</b>	Navigate the SAP S/4HANA system and use Fiori apps effectively.
<b>CLO 3</b>	Describe the integration of end-to-end business processes across modules.
<b>CLO 4</b>	Analyze data and reports using SAP's embedded analytics.
<b>CLO 5</b>	Gain insight into the digital transformation of enterprises using SAP S/4HANA

**g. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
3	-	2	4	20	20	20	60	30	150

L- Lectures; T- Tutorial; P- Practical; C- Credit; MSE- Mid-Semester Evaluation, CE- Continuous Evaluation, ESE- End Semester Examination

**h. Course Content:**

Sr. No.	Content	Weightage	Teaching Hours
1	<b>SAP ERP and SAP S/4HANA overview</b> SAP ERP and SAP S/4HANA overview; Evolution from ECC to S/4HANA; Key innovations and architecture of SAP S/4HANA; Differences between On-Premise and Cloud editions; SAP GUI and Web GUI navigation; Login and navigation in SAP system; Use of transaction codes and menu paths; Organizational elements in SAP (client, company code, plant, storage location, etc.); Introduction to SAP Fiori Launchpad; Fiori design principles and UX strategy; Fiori tiles, catalogs, groups, and spaces; Assigning roles and authorizations in SAP.	25%	10
2	<b>Procure-to-Pay Business Process</b> Overview of Procure-to-Pay cycle; Purchase requisition creation (manual and automatic); Source of supply determination; Request for quotation and quotation comparison; Creation of purchase orders (standard, contract, scheduling agreement); Goods receipt and inventory update in MM; Quality inspection during goods receipt; Invoice verification with MIRO; Payment processing and integration with FI; Vendor master data creation and maintenance; Vendor evaluation and classification; Integration of MM with finance and inventory modules.	25%	10
3	<b>Plan-to-Produce Business Process</b> Overview of Plan-to-Produce cycle; Master data in production (BOM, routing, work center); Material requirement planning (MRP) execution and analysis; Planning	10%	5

	<p>strategies and lot-sizing procedures; Production order creation and release; Material staging and confirmation; Goods issue and receipt in production; Capacity planning and leveling; Overview of Order-to-Cash process; Sales order creation and processing; Delivery processing and picking; Post goods issue (PGI); Billing document creation and output; Payment receipt and customer accounting; Cross-functional integration with MM, PP, and SD.</p>		
4	<p><b>Record-to-Report Business Process</b> Record-to-Report process overview; Financial accounting and controlling in SAP; General ledger master data; Journal entries and posting periods; Accounts receivable and dunning process; Accounts payable and vendor payments; Bank accounting and reconciliation; Period-end closing and financial reporting; Overview of Project System module; Project structuring using WBS and networks; Budgeting and cost planning; Project execution and confirmations; Asset master</p>	20%	10
5	<p><b>Human Capital Management</b> Organizational management in Human Capital Management (HCM); Enterprise structure and personnel structure; Personnel administration and actions; Hiring and employee master data maintenance; Infotypes and time-dependent data; Time management and shift planning; Overview of payroll process and integrations; Introduction to SAP Fiori apps for HCM; Role-based access to HR transactions via Fiori; Embedded analytics in SAP S/4HANA; Real-time operational reporting; Standard reports and KPI monitoring; Analytical tiles and dashboards in SAP Fiori; CDS views and customization</p> <ul style="list-style-type: none"> <li>• of reports.</li> </ul>	20%	10

**i. Text Book and Reference Book:**

1. Business Processes in SAP S/4HANA By Deb Bhattacharjee
2. First Steps in SAP S/4HANA By Venki Krishnamoorthy

**Experiment List**

Sr NO.	Experiment List
1.	Navigate SAP Fiori Launchpad and customize user roles
2.	Simulate full Procure-to-Pay lifecycle
3.	Perform MRP run and create a Production Order
4.	Create Sales Orders, Deliveries, and Billing Documents
5.	Post Financial Transactions and run G/L reports
6.	Use Project Builder and manage WBS elements
7.	Maintain employee records and simulate basic HCM processes
8.	Generate Analytical Dashboards using standard Fiori apps
9.	Perform cross-functional simulations
10.	Evaluate real-time business insights through KPI tiles

(7)

**j. Course Name:** ICT Workshop

**k. Course Code:** 03010702ES01

**l. Prerequisite:** Basic Computer Knowledge and Physics

**m. Rationale:** This course is design to provide basic knowledge of Electronics components and computer components. This course helps in learning problem solving process of Electronics circuits and Computer.

**n. Course Learning Objective:**

<b>CLOBJ 1</b>	Understand the fundamental concepts and operating principles of basic electronic components such as resistors, capacitors, inductors, and diodes.
<b>CLOBJ 2</b>	Demonstrate the ability to use testing instruments for measuring electrical parameters such as voltage, current, frequency, and resistance.
<b>CLOBJ 3</b>	Understand the basic concepts and types of power supplies, including DC regulated and unregulated power supplies.
<b>CLOBJ 4</b>	Demonstrate the interfacing of various IoT sensors with microcontrollers such as Arduino or similar platforms.

**o. Course Learning Outcomes:**

<b>CLO 1</b>	Gain ability to understand the working of Electronics Components
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<b>CLO 2</b>	Ability to understand the operating of various testing and measurement instrumentation.
<b>CLO 3</b>	Ability to use Power Supply
<b>CLO 4</b>	Ability to learn working and use of different IoT sensors
<b>CLO 5</b>	Ability to design electronic circuit for the specific applications.

**p. Teaching & Examination Scheme:**

Teaching Scheme				Evaluation Scheme					
L	T	P	C	Internal Evaluation			ESE		Total
				MSE	CE	P	Theory	P	
-	-	2	1	-	-	20	-	30	50

**L-** Lectures; **T-** Tutorial; **P-** Practical; **C-** Credit; **MSE-** Mid-Semester Evaluation, **CE-** Continuous Evaluation, **ESE-** End Semester Examination

**Experiment List**

Sr NO.	Experiment List
1.	Introduction to Breadboard and Digital Multi Meter, Verify the circuit analysis (voltage and current)
2.	Identification, symbolic representation and testing of various electronics components.
3.	To study CRO and Function generator with specifications.
4.	To verify Ideal Value and practical value of voltage regulator ICs.
5.	Introduction to Arduino IDE with LED Blinking
6.	Interfacing Button-Controlled LED with Arduino board.
7.	Buzzer Alarm System Using Arduino.
8.	Demonstrate the function of LCD Display Interfacing with Arduino.
9.	Relay-Based ON/OFF Control System with Arduino
10.	Demonstrate the working of Temperature Sensor-DHT11
11.	Demonstrate the working of Ultrasonic Distance Measurement sensor.
12.	Verify the functionality of water flow sensor
13.	Demonstrate the working of PIR Sensor using Arduino.
14.	Project based on electronics components and sensors