Government of Karnataka
Department of Technical Education

C-25 Diploma in Electronics & Communication Engineering

Scheme of Studies

(Effect from the AY 2025-26)

Government of Karnataka

DEPARTMENT OF TECHNICAL EDUCATION

Curriculum Structure

I Semester Scheme of Studies

Sl. No.	Teaching Department	Course Code	Course Name	Hours per week			Total Contact Hours/week	Credits	CIE Marks		Theory SEE Marks		Practice SEE Marks		Total Marks
				L	T	P			Max	Min	Max	Min	Max	Min	
Integrated Courses															
1	SC	25SC11I	Engineering Mathematics-I	4	0	4	8	6	50	20	50	20	-	-	100
2	CS	25CS01I	IT Skills	3	0	4	7	5	50	20	-	-	50	20	100
3	EE/EC	25EE01I	Fundamentals of Electrical & Electronics Engineering.	3	0	4	7	5	50	20	-	-	50	20	100
4	EC	25EC11I	Digital Electronics-I	4	0	4	8	6	50	20	50	20	-	-	100
Audit Course															
5	EC	25EC12I	Environmental Sustainability	2	0	0	2	2	50	20	-	-	-	-	50
6	Personality Development		NCC/NSS/YOGA/SPORTS...	Students are expected to engage in any one of these activities from 1st semester to 6th semester(No Credits)											
			Total	**16**	**0**	**16**	**32**	**24**	**250**	**-**	**100**	**-**	**100**	**-**	**450**

Note: The course 25EE01I shall be taught by faculty from the Electrical & Electronics (E&E) department. In the event that E&E faculty are not available in the institution, the course 25EE01I shall be assigned to faculty from the Electronics & Communication (E&C) department. If both E&E and E&C departments exist in the institution, the course 25EE01I shall be taught by the E&C faculty.

Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	**Electronics and Communication Engineering**	**Semester**	**1**
Course Name	**Digital Electronics-I**	**Type of Course**	**Integrated**
Course Code	**25EC11I**	**Contact Hours**	**8 hours/week (104 hours/semester)**
Teaching Scheme	**L: T:P :: 4:0:4**	**Credits**	**6**
CIE Marks	**50**	**SEE Marks**	**50 (Theory)**

1. Rationale:

Digital electronics stems from its inherent advantages in reliability, versatility, scalability, and integration, reflecting its critical role in modern technology. Digital systems have transformed various industries, leading to advances in computing, communication and automation, making it a fundamental aspect of contemporary engineering and technology.

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

CO-01	Understand and perform arithmetic and conversion operations on different number systems.
CO-02	Formulate, simplify and implement simple logic functions using logic gates.
CO-03	Build and analyze various combinational circuits in a real time environment.
CO-04	Identify and utilize the suitable ICs for different applications.

3. Course Content

WEEK	CO	PO	Theory	Practice
1	**1**	**1,2**	Introduction to Digital Electronics, Importance, and Its applications. https://youtu.be/DBTna2ydmC0?feature=shared Number Systems • Comparison between analog and digital signals with real-world examples. • Number systems: Binary, Decimal and Hexadecimal. Relevance and examples.	1.Demonstrate number system and its conversion by using scientific calculator and verify theoretically. 2. Familiarize Digital IC Trainer Kit and do the following, ☐ Precautions to be taken while handling ICs. ☐ Analyze Pin diagram of an IC. ☐ Demonstrate the testing of an IC using an IC tester.

			https://youtu.be/FFDMzbrEXaE?feature=shared Conversion between number systems with examples • Binary to decimal and vice versa. • Hexadecimal to decimal and vice versa. • Binary to hexadecimal and vice-versa (bitwise grouping only).	□ Demonstrate equivalent analog voltages for positive logic of logic 0 and logic 1 using Multimeter
2	**1,4**	**1,2**	Arithmetic operations and Codes • Arithmetic operations. □ Addition and Subtraction on 4 bit and 8 bit binary numbers with examples (integers only). □ Addition and subtraction of Hexadecimal numbers. • 1's & 2's complement of binary numbers with examples. • Representation of signed binary numbers. Problems on subtraction using 2's complement. • Codes: BCD, Gray and ASCII- its features with examples, applications	1. Perform BCD addition with simple examples. 2. Develop Binary to Gray code converter using IC 7486 and vice -versa.
3	**4**	**2,5**	Digital Integrated Circuits https://study.com/academy/lesson/video/digital-integrated-circuits-definition-types-examples.html • IC: Concept, Classification-Based on Scale of Integration. • IC- advantages and disadvantages • Logic-family concept, need and types of logic families. • Logic-family definitions: Propagation delay, fan-out, fan-in, power dissipation, noise margin, speed and speed-power product.	1. Verify the functionality of all the logic gates in the following ICs. a. 7432 b. 7408 2. Tabulate the parameters: Propagation delay, fan-out, fan-in, power dissipation, noise margin of the following ICs as per their Data Sheet. a. 7404 b. 7486
4	**2,4**	**1,2**	Boolean Algebra and Logic Gates: • Boolean algebra:Understanding of Constants, variables, functions with examples. • Boolean identities and Boolean Laws. • Logic-gates (NOT, OR, AND, NOR, NAND, EX-OR and EX-NOR) Symbol, function, expression and truth-table. • De-Morgan's Theorems with proof and examples.	1. Verification of Truth Table for all the logic gates. 2. Verify De-Morgan's Theorems using Logic gates.

5	**2,4**	**1,2**	<u>Universal Logic Gates & Boolean expression simplification</u> • Universal Logic Gates: Concept, examples. • Realization of all logic gates using NAND Gate. • Simplification of Boolean expressions using Boolean algebra. • Build the logic circuit using logic gates for simplified Boolean expression.	1. Realization of NOT, OR, AND gates using NOR Gates. 2. Realization of NAND, EX-OR, EX-NOR gates using NOR Gates.
6	**2,4**	**1,2**	<u>Boolean expression forms & conversions</u> • SOP and POS forms: Conversion into standard SOP forms. • Conversion into standard POS forms. • Translate SOP and POS expressions into truth-table. • Convert truth-table to SOP and POS expressions.	1. Simplify a given SOP (3 variable) using Boolean laws and realize it using logic gates. 2. Simplify a given POS (3 variable) using Boolean laws and realize it using logic gates.
7	**2,4**	**1,2**	<u>Boolean expression simplification using K Map</u> • Karnaugh Map: Need, Examples. • Map grouping rules. • Simplification of 2 and 3 variable Boolean expressions using K-map. • Realize the above simplification using logic gates.	1. Reduce any 4 variable Boolean expressions using K-map. 2. Realize and verify the above simplified Boolean expression using logic gates.
8	**3,4**	**2,3,4**	<u>Combinational Circuits: Arithmetic Circuits</u> • Features of combinational circuits, applications and examples. Half adder (HA): Concept, truth-table, logical expression, gate-level implementation. • Full adder (FA): Concept, truth-table, logical expression, gate-level implementation. • Half Subtractor (HS): Concept, truth-table, logical expression, gate-level implementation. • Full Subtractor (FS): Concept, truth-table, logical expression, gate-level implementation.	1. Construct and Verify Full Adder. 2. Construct and Verify Full Subtractor.

9	**3,4**	**2,3,4**	<u>Combinational Circuits: Adders & Comparators</u> • Serial adders and Parallel adders: Concept, comparison & their applications. • Working 8-bit serial adder. • 3-bit parallel adder: Concept, Block diagram and its working. • 1-bit magnitude comparator: Concept, Block diagram, truth-table, logical expression, gate-level implementation and application.	1. Implement 3-bit parallel adder using IC 7483. 2. Realize 1 bit comparator using logic gates.
10	**3,4**	**2,3,4**	<u>Combinational Circuits: Multiplexers</u> • Multiplexers (Mux): Concept, general block diagram, No. of inputs to select line calculation. • 2:1 Mux: Block diagram, truth-table, logical expression, gate-level implementation. • 4:1 Mux: Block diagram, truth-table, logical expression, gate-level implementation. • Applications of Mux.	1. Implementation of 2:1 Mux using logic gates. 2 Verify the functionality of 4:1 Mux using IC 74151.
11	**3,4**	**2,3,4**	<u>Combinational Circuits: De-Multiplexers</u> • De-Multiplexers (De-Mux): Concept, general block diagram, No. of inputs to select line calculation. • 1:2 De-Mux: Block diagram, truth-table, logical expression, gate-level implementation • 1:4 De-Mux: Block diagram, truth-table, logical expression, gate-level implementation • Applications of De-Mux.	1. Implementation of 1:2 De-Mux using logic gates 2. Verify the functionality of 1:4 De-Mux using IC 74139.
12	**3,4**	**2,3,4**	<u>Combinational Circuits: Encoders & Decoders</u> • 4:2 Encoder: Block diagram, truth-table, logical expression, gate-level implementation, Applications. • 2:4 Decoder: Block diagram, truth-table, logical expression, gate-level implementation, Applications. • Decimal-to-BCD encoder: Logic diagram, working, truth-table and application. • BCD-to-Decimal decoder: Logic diagram, working and truth-table.	1. Implement 4:2 Encoder using Logic gates. 2. Implement 2:4 Decoder using Logic gates.

13	**3,4**	**2,4**	7 - Segment Display • Seven-segment display: Principle and types. • Identify and list ICs for 7-segment display and Decoder. • BCD-to-seven segment decoder: Logic diagram, working and truth table (Only Anode Type)	Implement BCD to 7 Segment decoder using a suitable IC.

NOTE

1. In practice sessions all video demonstrations should be followed by MCQ/Quiz/Subjective questions and evaluation has to be documented.

2. Online course completion certification to be done on relevant topics on Swayam/NPTEL/Infosys Springboard platforms or any other platform.

3. Problems statement to be collected from the relevant industries, resolve and submit it to the course coordinator.

4. References:

i) Digital fundamentals – Thomas L. Floyd, PEARSON EDUCATION publication, Eleventh edition – Global Edition, ISBN 10: 1-292-07598-8, ISBN 13:978-1-292-07598-3.

ii) Digital Electronics –principles and integrated circuits. Anil K. Maini. Wiley publications, first edition. ISBN:978-81-265-1466-3.

iii) Digital principles and applications. Donald P Leach, Albert Paul Malvino, GoutamSaha, McGraw Hill Publisher, 7th edition, ISBN:978-0-07-014170-4.

iv) Digital Systems-principles and applications. Ronald J. Tocci, Neal S.Widmer, Gregory L. Moss, Prentice Hall Publications, 8th edition, ISBN:0-13-085634-7.

v) Digital Computer Fundamentals, -Thomas C Bartee, McGraw-Hill Publisher, 4th edition. ISBN 0-07-003892-9.

5. CIE Assessment Methodologies

Sl.No	**CIE Assessment**	**Test Week**	**Duration (minutes)**	**Max marks**	
1.	CIE-1Theory Test	4	90	50	Average of all CIE=50 Marks
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3 Theory Test	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
				Total	**50 Marks**

Note: -

Portfolio evaluation includes average of (a) and (b)

(a) Any one of the suggested activity model with report and presentation evaluated for 50 marks

(b) Each laboratory exercise will be evaluated for a total of 50 marks. The evaluation will include the following components:

1. Written description of the experiment in the observation book.
2. Conducting the experiment and the associated learning outcomes.
3. The results obtained from the experiment.
4. Corrections and evaluations of the experiment completed in the previous class, documented in the record book.

6. SEE - Theory Assessment Methodologies

Sl. No	SEE – Theory Assessment	Duration	Exam Paper Max marks	Exam Paper Max Marks scale down to (Conversion)	Min marks to pass
1.	Semester End Examination-Theory	3 Hours	100	50	20

7. CIE Theory Test model question paper

Program	Electronics and Communication Engg.			Semester -1	
Course Name	Digital Electronics-I			Test	I/III
Course Code		Duration	90 min	Marks	50
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					

Q.No	Questions	Cognitive Level	Course Outcome	Marks
	Section - 1			
1	a) Choose any 3 Analog signals and any 2 Digital signals from real environment	L3	CO1	05
	b) Convert the given Binary to Hexadecimal and a given Hexadecimal to Binary	L3	CO1	5+5
	c) Convert the given Binary to Gray and the given Gray to Binary	L3	CO1	5+5
2	a) Chart main advantages of digital signals over analog signals?	L3	CO1	05
	b) Convert the given Decimal to Hexadecimal and a given Hexadecimal to Decimal.	L3	CO1	5+5
	c) Perform addition of the given 4-bit binary number and subtraction of the given 4 bit binary number.	L3	CO1	5+5
	Section - 2			

3	a) Mention and explain any 5 Boolean laws in Boolean algebra. b) Create a truth table for a 3-input AND gate and OR gate. c) Realize the basic logic function using only NAND or NOR gates.	L2 L2 L3	CO2 CO2 CO2	5 10 10
4	a) State and Interpret De-Morgan's theorem. b) Express basic logic gates using only NAND gate? c) Simplify the given Boolean expression and implement using suitable Logic gates.	L2 L2 L3	CO2 CO2 CO2	5 10 10
Note for the Course coordinator: 1. Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes. All questions must be framed under Understand (L2) & Apply (L3) cognitive level using Revised Bloom's Taxonomy.				

Signature of the Course Coordinator | **Signature of the HOD** | **Signature of the IQAC Chairman**

8. CIE Practice Test model question paper

Program	**Electronics and communication Engineering**			**Semester**	**1**
Course Name	**Digital Electronics-1**			**Test**	**II/IV**
Course Code		**Duration**	**180 min**	**Marks**	**50**
Name of the Course Coordinator:					

Questions	**CO**	**Marks**
Write-up for two experiments and conduction of any one experiment.		**50**
Scheme of assessment **a) Writing the Circuit diagram, tabular column, calculations etc. for two experiments.** **b) Rig up and Conduction of any one** **c) Result** **d) Viva-voce**		**20** **15** **05** **10**
Total Marks		**50**

Signature of the Course Coordinator | **Signature of the HOD** | **Signature of the IQAC Chairman**

9. Suggestive Activities for students:

The List is an Example and not inclusive of all possible activities of the course. Students and Faculty are encouraged to choose activities that are relevant to the topic.

Note: Activity can be undertaken by either an individual or a team comprising up to 5 students.

Sl.No.	Suggestive Activities for students
01	**Designing a Simple Digital lock.** To design and implement a digital lock using combinational logic that requires a specific 3-bit binary code to unlock. Components: * 7404 (NOT Gate IC) * 7408 AND Gate IC) * 7432 (OR Gate IC) * 7486 (XOR Gate IC) * Breadboard, jumper wires, logic switches, LEDs, resistors.
02	**Designing a Simple Parity Checker.** To design a simple parity checker using combinational logic that determines whether a binary number has even or odd parity. Components: * 7404 (NOT Gate IC) * 7408 (AND Gate IC) * 7432 (OR Gate IC) * Breadboard, jumper wires, logic switches, LEDs, resistors
03	**Designing a Simple 4-bit BCD Adder**. To design and implement a 4-bit Binary-Coded Decimal (BCD) adder that adds two 4-bit BCD numbers and produces a BCD result. Components: * 7404 (NOT Gate IC) * 7408 (AND Gate IC) * 7432 (OR Gate IC) * 7486 (XOR Gate IC) * Breadboard, jumper wires, logic switches, LEDs, resistors
04	**Designing a Simple Binary-to-Decimal Converter**. To design and implement a binary-to-decimal converter using combinational logic that converts a 4-bit binary number to its decimal equivalent, displaying the result on LEDS. Components: * 7404 (NOT Gate IC) * 7408 (AND Gate IC) * 7432 (OR Gate IC) * 7447 (BCD to 7-segment Decoder IC) or equivalent * 7-segment displays (if using a BCD decoder) * Breadboard, jumper wires, logic switches, resistors.
05	**Designing a Simple 4-bit Binary Alarm System.** To design and implement a basic 4-bit binary alarm system that triggers an alarm when a specific 4-bit binary code is entered. Components: 7404 (NOT Gate IC) 7408 (AND Gate IC) 7432 (OR Gate IC) 7486 (XOR Gate IC) Breadboard, jumper wires, logic switches, buzzer or LED (for alarm), resistors.

10. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		10	20	30	40	50	
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	40
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	30
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	50
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	20
	Average Marks=(40+30+50+20)/4=35						**35**

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

11. Equipment/software list with Specification for a batch of 30 students

Sl.No.	Particulars	Specification	Quantity
01	Digital trainer kits.		15
02	IC tester, logic probes.		05
03	Digital Multimeters		15
04	Suitable ICs		20 Each
05	Patch cards (Different lengths)		300

Government of Karnataka
DEPARTMENT OF TECHNICAL
EDUCATION

Program	Engineering	Semester	I
Course Name	Engineering Mathematics-I	Type of Course	Integrated
Course Code	25SC11I	Contact Hours	8 hours/week (104 hours/semester)
Teaching Scheme	L:T:P - 4:0:4	Credits	6
CIE Marks	50	SEE Marks	50

1. Rationale

The course is designed to give a comprehensive coverage at an introductory level to the subject of Matrices and Determinants, Vectors, Trigonometry, Complex numbers and Limits.

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

CO-01	Solve the system of linear equations using determinants and performs the same in MS Excel.
CO-02	Apply the knowledge extensively in finding product of two vectors and executes the same in GeoGebra graphing calculator tool..
CO-03	Able to solve physical problems using trigonometric ratios and visualize the graphs of trigonometric functions in GeoGebra graphing calculator.
CO-04	Able to solve problems on algebra of complex numbers and interpret the results graphically.
CO-05	Evaluate the limit of a single variable function and extract the limit values for discretized data of a one variable function in MS excel.

3. Course Content:

WEEK	CO	PO (L3-Highly mapped)	Theory (4 Hours per week)	Practice (4 Hours per week)
1	**1**	**1,4,7**	**MATRICES**: -Definition and order of matrices Types of matrices: Row matrix, Column matrix, Zero matrix (Null matrix), Square matrix, Diagonal matrix, Scalar matrix, Unit matrix (Identity matrix)	**Practice-1:** Introduction to MS Excel
	1	**1,4,7**	Algebra of matrices: Scalar multiplication and Transpose of a matrix	
	1	**1,4,7**	Addition and Subtraction of matrices (2x2 only)	**Practice-2:** Compute addition, subtraction, scalar multiplication of matrices in MS Excel.
	1	**1,4,7**	Product of two matrices (2x2 only) and Problems	
	1	**1,4,7**	Problems continued	

2	**1**	**1,4,7**	**DETERMINANTS:** Definition, Expansion of determinant of order 2 and Problems	**Practice-3:** Compute multiplication, transpose of matrices in MS Excel.
	1	**1,4,7**	Cramer's Rule (Determinant method): Solution of the system of linear equations with two unknowns and Problems	**Practice-4:** Compute determinant, and inverse of matrices in MS Excel.
	1	**1,4,7**	Minors, Co-factors, evaluating Adjoint of square matrices explicitely by finding minor and co-factors (2X2 only) and Problems	
3	**1**	**1,4,7**	Definition of Singular and non-singular matrices, Inverse of a matrix (2X2 only) and Problems	**Practice-5:** Solve the system of linear equations by Cramer's rule in MS Excel.
	1	**1,4,7**	Characteristic equation and characteristic roots of a matrix (2X2 only) and problems	
	2	**1,4,7**	**VECTORS:** Definition, notation and types of vectors [Null, Unit, Equal, Coplanar and Collinear vectors]	**Practice-6:** Installation and introduction to tools in GeoGebra.
	2	**1,4,7**	Position vector & its magnitude and problems	
4	**2**	**1,4,7**	Problems on equilateral, isosceles, right-angled triangle	**Practice-7:** Finding magnitude of a vector, sum and difference of two vector and visualize it in GeoGebra graph.
	2	**1,4,7**	Expression and formula for unit vector along the given vector and problems	
	2	**1,4,7**	Addition and Subtraction of two vectors (Algebraically) and problems	**Practice-8:** Verifying whether the given three position vectors are vertices of an equilateral triangle in MS excel.
	2	**1,4,7**	Scalar product (dot product) of two vectors and problems	
5	**2**	**1,4,7**	Applications of Scalar product: Cosine of an angle between two vectors and problems	**Practice-9:** Find the scalar product of two vectors also find the angle between two vectors degrees in GeoGebra. Visualize the dot product of two vectors and hence verify the property of orthogonality.
	2	**1,4,7**	Condition for two vectors to be orthogonal or perpendicular and problems	
	2	**1,4,7**	Projection of $\vec{a}$ on $\vec{b}$ and $\vec{b}$ on $\vec{a}$ and problems	**Practice-10**: Find the work done by the force applied at different angles on the body to move it from point A to B. Hence analyze the amount of work done and give the physical interpretation.
	2	**1,4,7**	Work done by the vector (force) and problems	
6	**3**	**1,4,7**	**TRIGONOMETRY:** Recapitulation of Trigonometric ratios and identities.	**Practice-11:** Plot the graphs of trigonometric functions for sinx, cosx and tanx in the interval $[-\pi, \pi]$ in GeoGebra.
	3	**1,4,7**	Define radian of an angle. Conversion of angles (Degree to Radian and Radian to Degree) and Problems	
	3	**1,4,7**	Allied angles: Definition of allied angle, ASTC Rule	**Practice-12:** Verify the ASTC rule of quadrants in GeoGebra.

	3	**1,4,7**	Rules of allied angles $(-\boldsymbol{\theta}, \mathbf{90^0} \pm \boldsymbol{\theta}$ & $\mathbf{270^0} \pm \boldsymbol{\theta}$) and simple Problems.	
7	**3**	**1,4,7**	Rules of allied angles $(\mathbf{180^0} \pm \boldsymbol{\theta}$ & $\mathbf{360^0} \pm \boldsymbol{\theta}$) and simple Problems.	**Practice-13:** Construction of clinometer for measurement of sides and angles of a triangle.
	3	**1,4,7**	Problems continued on Allied angles	
	3	**1,4,7**	Problems continued on Allied angles	**Practice-14:** Usage of clinometer **(DEMONSTRATION)**
	3	**1,4,7**	Compound Angles: Formulae for $\boldsymbol{sin(A \pm B)}$, $\boldsymbol{cos(A \pm B)}$ $\boldsymbol{and}$ $\boldsymbol{tan(A \pm B)}$(without proof) and T-functions of 15^0 ,75^0 and 105^0	
8	**3**	**1,4,7**	Multiple Angles: sin2A, cos2A, tan2A with proof	**Practice 15:** Using clinometer find the heights and distances of physical objects in the surroundings.
	3	**1,4,7**	Multiple Angles: sin3A and cos3A with proof	
	3	**1,4,7**	Applications of Trigonometry: Introduction to Heights and Distances	**Practice-16:** Using clinometer measure the heights and distances of objects in the surrounding.
	3	**1,4,7**	Problems based only on angle of inclination	
9	**4**	**1,4,7**	**COMPLEX NUMBERS:** - Definition, real and imaginary parts of a complex number $\boldsymbol{z = a + ib}$. Examples	**Practice-17:** Plot the Cartesian complex numbers z_1, z_2, z_3, z_4 and z_5. Also plot $z_1 + z_2$, $z_3 - z_4$, $2z_1$, z_3/z_4 and $z_4 \times z_5$ in the graph sheets
	4	**1,4,7**	Modulus and amplitude of a complex number and Problems	
	4	**1,4,7**	Conjugate of a complex number and Problems	**Practice-18:** Plot the polar complex numbers z_1, z_2, z_3, z_4 and z_5. Also plot $z_1 + z_2$ *and* $z_3 - z_4$ in the graph sheets
	4	**1,4,7**	Addition and subtraction of complex numbers and Problems	
10	**4**	**1,4,7**	Multiplication of complex numbers and Problems	**Practice-19:** Generate 50 random data, construct the frequency distribution table and plot Bar chart using MS Excel.
	4	**1,4,7**	Ratio of two complex numbers and Problems	
	4	**1,4,7**	Polar form of a complex number and Problems	**Practice-20:** Generate 50 random data, construct the frequency distribution table and plot Pie chart using MS Excel.
	4	**1,4,7**	Exponential form of a complex numbers and Problems	
11	**4**	**1,4,7**	Conversion of Cartesian form into polar and exponential forms and Problems	**Practice-21:** Generate 50 random data, construct the frequency distribution table and plot Line graph using MS Excel.
	4	**1,4,7**	Problems continued	
	5	**1,4,7**	**LIMIT OF FUNCTIONS:** Constants and variables, Definition of function. Concept of limits	**Practice-22:** Generate 50 random data, construct the frequency distribution table and scatter plot using MS Excel.
	5	**1,4,7**	Evaluation of limits by factorization method and problems	
12	**5**	**1,4,7**	Problems continued	**Practice-23:** Generate 50 random data, construct the frequency
	5	**1,4,7**	Evaluation of limits by rationalization method and problems	

				distribution table and plot Histogram using MS Excel.
	5	**1,4,7**	Problems continued	**Practice-24:** Plot the following functions in GeoGebra and visualize the graphs. i) Odd function ii) Even function iii) Algebraic function iv) Trigonometric functions v) Exponential functions vi) Logarithmic functions
	5	**1,4,7**	Evaluation of limit of a function of the type $\lim_{x\to\infty}\left(\frac{f(x)}{g(x)}\right)$ and Problems	
13	**5**	**1,4,7**	Problems continued	**Practice-25**: Using MS Excel, verify that, as x tends to zero the ratio $\frac{sinx}{x}$ tend to 1, for 20 discrete data in the interval [0.5, 0.1]. (**DEMONSTRATION**)
	5	**1,4,7**	Standard Limits (without proof): a)$\lim_{x\to a}\left(\frac{x^n-a^n}{x-a}\right)=$ na^{n-1},where n is rational b)$\lim_{\theta\to 0}\left(\frac{\sin\theta}{\theta}\right)=1$, where $\theta$is in radians c) $\lim_{\theta\to 0}\left(\frac{\tan\theta}{\theta}\right)=1$where θ is in radians d) $\lim_{x\to 0}\left(\frac{e^x-1}{x}\right)=1$	
	5	**1,4,7**	Problems on Standard Limits	**Practice-26:** Evaluation of limits of standard type in *wolfram alpha.* **(DEMONSTRATION)**
	5	**1,4,7**	Problems continued	

4. References:

1. NCERT Mathematics Books for Class XI and XII.
2. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.
3. G.B.Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.
4. V.Sundaram, R.Balasubramanian, K.A.Lakshminarayanan, Engineering Mathematics, 6/e., Vikas Publishing House.
5. Reena Garg & Chandrika Prasad, Advanced Engineering Mathematics, Khanna Publishing House, New Delhi.
6. Online resources (courtesy you tube)
   i) https://www.youtube.com/watch?v=wbJcJCkBcMg – Excel for beginners
   ii) https://www.youtube.com/watch?v=RDFb--em5Kg – construction of clinometer.
   iii) https://www.youtube.com/watch?v=tn6UoIz-1yM – using clinometer.
   iv) https://www.geogebra.org/download?lang=en- to download GeoGebra.
   v) https://www.youtube.com/watch?v=RYGBhRN9oHQ&list=PLqZ0eZtMcAlugmcomSSvjPBfewVbX35L7 - Basics of GeoGebra
   vi) https://www.youtube.com/@grantsander9529 – More videos on GeoGebra

5. CIE and SEE Assessment Methodologies:

Sl. No	Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1 Theory Test	4	90	50	Average of all CIE=50 Marks
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3 Theory Test	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total Continuous Internal Evaluation (CIE)					50 Marks
Semester End Examination (SEE) -Theory			180	100	50 marks (100 marks Scaled down to 50 marks)
				Total Marks	100 Marks
Minimum marks to pass in CIE & SEE is 40% individually					

6. CIE Theory Test Model question paper:

CIE 1(at the end of 4th week)

Program	**_____ Engineering**	**Semester**	**I**
CourseName	Engineering Mathematics-I	**Marks**	**50**
Course Code	**25SC11I**	**Duration**	**90 min**
Name of the Course Coordinator:			

	Section A (Answer any six questions, each question carries 5 marks)			
Q. No.	**Questions**	**CL**	**CO**	**PO**
1			1	
2			1	
3			1	
4			1	
5			1	
6			1	
7			1	
8			1	
9			1	
Section B (Answer any four questions, each question carries 5 marks)				
10			2	
11			2	
12			2	
13			2	
14			2	
15			2	

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

CIE 3(at the end of 10th week)

Program	_____ Engineering	Semester	I
CourseName	Engineering Mathematics-I	Marks	50
Course Code	25SC11I	Duration	90 min
Name of the Course Coordinator:			

Q. No.	Questions	CL	CO	PO
	Section A (Answer any one question, each question carries 5 marks)			
1			2	
2			2	
	Section B (Answer any six questions, each question carries 5 marks)			
3			3	
4			3	
5			3	
6			3	
7			3	
8			3	
9			3	
10			3	
	Section C (Answer any three questions, each question carries 5 marks)			
11			4	
12			4	
13			4	
14			4	
15			4	

7. CIE Practice Test:

Program	Engineering			Semester	I
CourseName	Engineering Mathematics-I			Test	II/IV
Course Code	25SC11I	Duration	3 Hrs	Marks	50
Name of the Course Coordinator:					
Questions				CO	Marks
a. **OR** b.					50
Scheme of assessment a) Observation b) Conduction c) Result and Output d) Viva					 10 20 10 10
II--CIE (ANY ONE QUESTION FROM PRACTICE 1 TO 12(Except 1 and 6) IV--CIE (ANY ONE QUESTION FROM PRACTICE 15 TO 24) Total Marks					50

Signature of the Course Coordinator Signature of the HOD Signature of the IQAC Chairman

8. Suggestive Activities:

The List is only shared as an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevantto the topic and on the availability of such resources at their institution.
Note: Minimum 3 suggested activities should be done.

Sl. No.	Suggestive Activities
01	Application of matrices in coding and decoding.
02	Applications of vectors in dynamics
03	Applications of trigonometry in respective programme domains
04	Plotting circles of different radii($\|z - z_0\| = r$) , discs($\|z - z_0\| = r$) and annulus ($R_1 \leq \|z - z_0\| \leq R_2$) in complex plane and record the same in the a document.
05	Evaluation of limits using Wolfram alpha platform.

9. Sample Rubrics for Assessment of Activity (Qualitative Assessment)

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		2	4	6	8	10	
1	Knowledge	Poor knowledge About the subject	Normal knowledge about the subject	Good knowledge about the subject	Very good knowledge about the subject	Excellent knowledge about the subject	8
2	Problems solving ability	Solved minimum number of problems with maximum mistakes	Solved minimum number of Problems	Solved problems with few mistakes	Solved maximum number of problems	Solved all problems in neat manner	10
3	Strategies and Procedure	Hardly uses an effective strategy to solve problems.	Rarely uses an effective strategy to solve problems.	Sometimes uses an effective strategy to solve problems, but does not do it consistently.	Typically, uses an effective strategy to solve the problem(s).	Typically, uses an efficient and effective strategy to solve the problems	10
4	Completion	Several of the problem are not completed	Only 30% of the questions are answered correctly	Only 50% of the questions are answered correctly	Only 75% of the questions are answered correctly	All assignment questions are answered correctly	8
5	Neatness and Organization	The work appears sloppy and unorganized. It is hardly to know what information goes together.	The work appears sloppy and unorganized.	The work is presented in an organized fashion but may be hard to read at times.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in a neat, clear, organized fashion that is easy to read.	8
	Total marks=8+10+10+8+8=44						44

Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	Electrical & Electronics Engineering	**Semester**	**I / II**
Course Name	Fundamentals of Electrical and Electronics Engineering	**Type of Course**	Integrated
Course Code	**25EE01I**	**Contact Hours**	7 hours/week 91 hours/semester
Teaching Scheme	3:0:4	**Credits**	5
CIE Marks	**50**	**SEE Marks**	**50 (Practice)**

1. Rationale:

Fundamentals of Electrical and Electronics Engineering is essential for all streams of diploma engineering.
At the end of this Course the student is able to gain knowledge about electrical safety, DC and AC circuits,
Electrical wiring circuits, protective devices, electrical machines, and working of electronics devices

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

CO-01	Comply with the Electrical safety procedures
CO-02	Analyze simple electrical circuits and Wire up simple demotic electrical wiring systems with proper protective device
CO-03	Identify different types of electrical machines and interpret Name plate details of given electrical machines
CO-04	Test and report condition of given Battery and connect UPS to AC Mains.
CO-05	Identify and select the Electronic components for given application

3. Course Content

WEEK	CO	PO	Theory	Practice
1	1	1,4	**Electrical safety Procedures:** ● Meaning of Electrical Safety ● Safety precautions in electrical working place ● Electrocution (Electric shock) and How to free a person from electrocution.	● Demonstrate use of Personal Protective Equipment (PPE) and types ● Electrocution (Electric shock) Use Videos to demonstrate how to free a person from electrocution
	1	1,4	First aid in Electrical injury and methods Electrical fire, causes and preventions Fire extinguishers and types	Demonstration of Pipe and plate Earthing methods Know your Electrical lab. Identify power supply, various components with symbols, Check earthing by measuring the voltage between neutral and earth points.
	1	1,4	● Types of Electrician Tools and their functions ● Earthing Definition, necessity and types Advantages of Earthing	
2	2	1,4	**Sources of Electricity** ● Sources of Electricity- Conventional and Non-conventional sources ● Advantages of electrical energy ● Effects of electric current and its applications	Video demonstration on identification and observation of different ranges and types of meters Verification of Ohm's Law using simple circuit
	2	1,4	**Definition, units and meters;** Electric Current, Voltage, Resistance, Potential Difference, EMF **Ohm's Law;** ● Statement, explanation, Applications and limitations.	Demonstrate experimentally Open circuit, closed circuit and short circuit conditions in Simple series circuit.
	2	1,4	**Circuit conditions**- ● open, close, and short circuit	
3	2	1,4	Features of Series and Parallel circuits	Determine the equivalent Resistance in series resistive circuit
	2	1,4	Simple problems on Series circuit	
	2	1,4	Simple problems Parallel circuit.	Determine the equivalent Resistance in parallel resistive circuit

4	2	1,4	**Definitions, units and meters;** ● Electrical work, power and energy, ● Simple problems on Electrical energy consumption (Unit/ KWh)	1. Measure the AC voltage, current, power , using relevant measuring instruments in a Single phase AC circuit 2. Measurement of energy in a Single phase AC circuit
	2	1,4	**AC Fundamentals** ● Sinusoidal voltage,current, ● definitions of amplitude, cycle, time-period, frequency	Demonstrate the measurement of Amplitude, peak-peak value, time period and frequency of AC quantity using CRO and function generator.
	2	1,4	● Single phase and Three phase electrical power supplies ● Applications of single-phase and three-phase power ● Merits of three phase system over single phase system.	
5	2	1,4	**Protective Devices** ● Meaning ● Necessity of protective devices ● Functions and Applications of ✓ Rewireable Fuse ✓ Glass cartridge fuse ✓ HRC fuse	Wire up and test PVC Conduit wiring to control two lamps and one socket independently by providing suitable protective devices.
	2	1,4	✓ Kit-kat fuse ✓ MCB ✓ ELCB	Wire up and test to control one lamp from two places using suitable protective devices (Two- way control/ Staircase wiring)
	2 2	1,4	● Types of wiring systems and accessories	
6	3	1,4	**Electromagnetic Induction:** ● Definition, Faraday's laws, Statically and dynamically induced EMF generation. ● Self and mutual induced EMF.	Control a lamp using Electromagnetic Relay

	3 3	1,4	**Transformers:** ● Function, working, video demonstration on construction of transformer	Determine experimentally the transformation ratio of a given Transformer
	3	1,4	● Classification and applications, Transformation ratio.	
7	3	1,4	**Generators**: ● DC and AC Generators- definition, types and applications	Study the Name plate details of a given Electrical machine
	3	1,4	**DC Motors:** ● Definition, types and applications. ● BLDC motor applications	Video demonstration of construction of three phase Induction Motor.
	3	1,4	**AC Motors:** ● Definition ,Types & Applications ● Necessity of starters for AC motors. ● Types and applications.	Wire up a starter to start and reverse the 1 Phase/3 phase AC motor.
8	4	1,4	**Cells and Batteries:** ● Definition, symbol, types, comparison and applications	Construct a simple battery using primary cells for the required voltage and to light an LED through a resistor in series.
	4	1,4	● Lead Acid battery and its maintenance	Video demonstration on construction of Lithium-Ion battery
	4	1,4	● Lithium-Ion battery and its applications	
9	4	1,4	● Ampere-Hour Capacity, Selection criteria of batteries	Test and report the condition of given Lead Acid battery /Lithium-Ion battery
	4	1,4	**UPS** ● Meaning, types and applications	
	4	1,4	● Block diagram of online UPS system.	Connect UPS in an electrical lighting system and observe continuity of supply. Measure the AC voltage.
10	4	1,4	● Introduction of Alternate Energy Sources and Applications	Video Demonstration on working of a Simple Electric Vehicle
	4	1,4	● Evolution of Electric Vehicles, Batteries used for EVs	
	4	1,4	● Electric Motors used in EVs ● Battery and UPS ratings for Solar powered Street lighting	Video demonstration on solar powered street lighting

11	5	1,4	**Electronic Components** ● Resistors, Capacitors and Inductors - Definition, Unit, Types, and Applications.	Identify and determine the value of resistance, inductance and capacitance using LCR meter Compute the value of a given carbon resistor using colour coding.
	5	1,4	● Definitions of conductors, insulators and semiconductors with examples ● comparison and applications	Identify the terminals of Diode. Connect the diode in forward and reverse bias modes and observe the status of the LED connected in the circuit.
	5	1,4	**Semiconductor Diode;** ● Definitions of P and N type semiconductors, ● Diode and its Symbol ● Working of Diode in forward and reverse bias ● Types of diodes and ratings ● Applications	
12	5	1,4	**Rectifier** • Definition, types, working of Bridge rectifier	Trace the input and output waveforms of an IC Bridge rectifier.
	5	1,4	**Transistor** ● Definition and Types ● Symbol ● Applications	
	5	1,4	**Digital fundamentals** ● Integrated Circuits (IC) - Definition, advantages and applications ● Logic Gates- Symbol, Boolean expression and truth table of AND, OR, NOT, NAND,NOR, EX- OR gates	Verify the truth tables of AND, OR, NOT, NAND, NOR, EX-OR gates
13	5	1,4	**Sensors and Actuators;** ● Definition, Types and Applications of sensors	1. Construct Photo-diode circuit and Test for its working 2. Detect an object using IR proximity sensor
	5	1,4	● LDR, Photodiode, and Photo transistor (opto-isolator), Solar cell- Symbol and Applications	
	5	1,4	● Definition of Actuator, Types and applications. ● PLC- Block diagram and PLC applications.	Video demonstration on working of any simple Mechanical/ Electrical Actuator. List commercially available PLCs.

4.References:

1. ABC of Electrical Engineering by B. L. Theraja and A. K. Theraja, S Chand Pu
2. Basic Electrical and Electronics Engineering by S. K. Bhattacharya, Pearson Education India, 2012 Edition
3. Electronic Devices and Circuits by I. J. Nagrath, PHI Learning Pvt. Ltd., 2007 Edition.
4. Basic Electrical Engineering byV. Mittle and ArvindMittle, McGrawHill Companies, 2005 Edition
5. The 8051 Microcontroller & Embedded systemsusinkbnnnjbbh bb vvvvg assembly and C (2ndEdition)–M.A.Mazidi , J.C. Mazidi&R.D.McKinlay ISBN: 81-317-1026-2

6. Programmable Logic controllers, W BOLTON
7. https://www.youtube.com/watch?v=mc979OhitAg&list=PLWv9VM947MKi 7yJ0 FCfzTBXpQUQd3K
8. https://www.youtube.com/watch?v=CWulQ1ZSE3c
9. en.wikipedia.org/wiki/Transformer
10. http://www.animations.physics.unsw.edu.au//jw/AC.html
11. http://www.alpharubicon.com/altenergy/understandingAC.htm
12. http://www.electronics-tutorials/
13. http://www.pitt.edu/~qiw4/Academic/ME2082/Transistor%20Basics.pdf
14. http://www.technologystudent.com/elec1/transis1.htm
15. http://www.learningaboutelectronics.com/
16. http://www.electrical4u.com/
17. https://www.youtube.com/watch?v=zLW
18. https://www.youtube.com/watch?v=8PTNjw-hQIM

5. CIE Assessment Methodologies

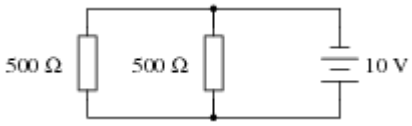
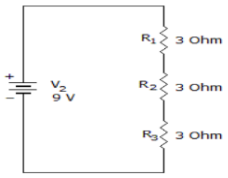
Sl. No	CIE Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1TheoryTest	4	90	50	Average of all CIE=50 Marks
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3TheoryTest	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
				Total	**50 Marks**

6. SEE – Practice Assessment Methodologies

Sl.No	SEE – Practice Assessment	Duration (minutes)	Max marks	Min marks to pass
1.	Semester End Examination-Practice	180	50	20

7. CIE Theory Test model question paper

Program	Electrical & Electronics Engineering			**Semester -I/II**	
Course Name	Fundamentals of Electrical and Electronics Engineering			**Test**	**I/II I**
Course Code	**25EE01I**	**Duration**	**90 min**	**Marks**	**50**
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					

Q.No	Questions	Cognitive Level	Course Outcome	Marks
	Section - 1			
1	a) List any 5 electrician tools. Mention their function. b)State and explain Ohm's Law. List the limitations of Ohm's Law. c)Compare single-phase and three-phase power. d)Calculate the total current drawn by the below circuit. 	1 2 3 4	1 2 2 2	5 8 6 6
2	a)Define earthing. List the different types of earthing. b)With simple diagrams explain open circuit, short circuit and closed circuit c)What are the Advantages of three phase power over single phase power. d) Find the equivalent resistance and the current flowing through 3-ohm resistance in the circuit below. 	1 2 3 4	1 2 2 2	5 8 6 6
	Section - 2			
3	a)List any 5 sources of electrical energy b) Draw a sinusoidal waveform and name amplitude, instantaneous value, time period, frequency and cycle. c)How to free a person from electrocution? d)An electric fan draws a current of 0.9 Amps when connected to a single-phase, 230 volts, 50 HZ AC supply through an electric regulator. Determine the resistance of the regulator.	1 2 3 4	1 2 2 2	5 8 6 6

4	a)List the safety precautions to be taken in an electrical working place b)Define Current, Voltage and Resistance. Mention their symbol and Units. c)List the different types of fire extinguishers. Which type of fire extinguisher do you use to extinguish fire caused by wood and cooking oil? d)A 9 Volt cell when used in an electrical circuit turns on a LED. State the effect of electric current. Justify	1 2 3 4	1 2 2 2	5 8 6 6
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.				

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

8. CIE Practice Test model question paper

Program	Electrical & Electronics Engineering			**Semester**	**I/II**
Course Name	Fundamentals of Electrical and Electronics Engineering			**Test**	**II/IV**
Course Code	**25EE01I**	**Duration**	**180 min**	**Marks**	**50**
Name of the Course Coordinator:					

Questions	**CO**	**Marks**
NOTE : Any ONE of the following questions may be allotted to each student		**50**
1. Verify Ohm's Law using a simple circuit.	**1**	
2. Demonstrate experimentally Open circuit, closed circuit and short circuit conditions in Simple series circuit.	**2**	
3. Determine the equivalent Resistance in series circuit	**2**	
4. Determine the equivalent Resistance in parallel circuit		
5. Measure the AC voltage, current, power using relevant measuring instruments in a Single phase AC circuit	**2**	
6. Measurement of energy in a Single phase AC circuit	**2**	
7. Measure Amplitude, peak-peak value, time period and frequency of AC quantity using CRO and function generator.	**2**	
8. Wire up and test PVC Conduit wiring to control two lamps and one socket independently by providing suitable protective devices.	**2**	
9. Wire up and test to control one lamp from two places using suitable		
10. protective devices (Two- way control/ Staircase wiring)	**2**	
11. Wire up Panel board wiring with protective devices (fuse, MCB, load, Neutral link)		
12. Control a lamp using Electromagnetic Relay	**2**	
13. Demonstrate the concept of Electromagnetic induction using coil, magnet and galvanometer	**2** **3**	
14. Determine experimentally the transformation ratio of a given Transformer	**3**	
15. Wire up a starter to start and reverse the 1 Phase/3 phase AC motor.	**3**	

Scheme of assessment	
a) Identification of meters/ equipment/wires/tools etc	**5**
b) Writing Circuit/writing diagram and Procedure	**12**
c) Conduction	**18**
d) Results	**5**
e) Viva-voce	**10**
Total Marks	**50**

Signature of the Course Coordinator
Signature of the HOD

9. Suggestive Activities:

The List is an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose **any two** activities that are relevant to the topic

Sl.No.	Suggestive Activities
01	Given the practical working circuits, measure Resistance, Current, Voltage, Power and Energy in DC and AC (Single phase) Circuits Using suitable meters/ instruments.
02	List out the different types of wiring systems used in your laboratories or house with their representation
03	Mini-Projects: Like preparing extension box, switch box and wiring models
04	List out the different protective devices used in your laboratories or house with their ratings.
05	Applications of Electromagnetic Induction, statically induced and dynamically induced emf, self and mutual induced emfs
06	Prepare a report on types of starters and enclosures used for various industrial applications of AC motors.
07	Types of Cells and Battery maintenance
08	Visit a nearby Battery charging shop or showroom and prepare a report of the visit.
09	Prepare a report on various types of diodes used for various industrial applications.
10	Prepare a report on various types of sensors and actuators used for various industrial applications.
11	Mini-Projects: Connect and test a sensor (domain application) to a Digital circuit
12	Prepare a report stating HP rating, types and applications of FHP motors.

10. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Student Score
		2	4	6	8	10	
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	8
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	6
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	2
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	2
	Average Marks=(8+6+2+2)/4=4.5						**5**

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	**Computer Science and Engineering**	**Semester**	1/2
Course Name	**IT Skills**	**Type of Course**	Integrated
Course Code	**25CS01I**	**Contact Hours**	7 per week
Teaching Scheme	3: 0:4	**Credits**	5
CIE Marks	50	**SEE Marks**	50 (Practice)

1. Rationale:

In today's fast-changing digital world, foundational IT skills are crucial for technical professionals. This course equips students with hands-on experience in key areas, including computer fundamentals, cybersecurity, problem-solving, **Cloud Computing**, IoT, Artificial Intelligence (AI), and prompt engineering. Additionally, it covers IT certifications to help students build industry-relevant expertise and enhance their job readiness.

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

CO-01	Demonstrate knowledge of computer hardware, software, networking, and internet services.
CO-02	Identify common cyber threats and implement security measures.
CO-03	Apply algorithmic thinking and block-based coding to create simple programs.
CO-04	Explain applications of digital technologies such as Cloud, IoT and AI.
CO-05	Apply AI tools and prompt engineering techniques to generate meaningful outputs.

3. Course Content

Week	**CO**	**PO**	**Lecture(3HRS) (Knowledge Criteria)**	**Practice(4HRS) (Performance Criteria)**
1	**1**	**1, 4**	**Introduction to Computers** ▪ Definition and basic understanding of a computer.	1. Identify the parts of a computer system.

			▪ Generations of Computers ▪ Classification of computer based on their size, purpose, functionality, and technology. ▪ Functional Block Diagram of a Digital Computer. **Memory Systems:** Types of Memory and Their Usage: Primary Memory, Secondary Memory: Input/output Systems **Software:** System software vs. application software	2. Identify the operating system and hardware specifications of a computer.. 3. Basic folder/ file operations (GUI based) 4. Install application software such as web browser, scratch. 5. Hardware scavenger hunt (students identify components in disassembled PC images). Case Study: Prepare a report on important factors to be considered while buying a computer (based on purpose and budget).
2	**1**	**1, 4**	**Internet skills:** ▪ What is Computer Networks? ▪ Types of Networks. Physical and Logical address, Protocols, Key Devices in a Network (Router, Switch, Modem, Access Point) ▪ What is Internet? Common Applications of the Internet; ▪ Browsers, Web Server, Client–Server Model, URL, Search Engine, Domain name and domain name system, websites. ▪ Personal website, website hosting.	1. Explore and list 3 real-world examples for each type of network (LAN, MAN, WAN). 2. Find your Physical (MAC) and Logical (IP) Address 3. Create an email account (e.g., Gmail, Outlook) and explore its security settings 4. Using a Search Engine Effectively : Search for "How does a Search Engine work?" 5. Design, develop and host a personal website using any free platform such as wix.com or worldpress.com 6. Test Internet speed
3	**2**	**1, 4, 7**	**Cybersecurity** ▪ Introduction to Cybersecurity ▪ What is Cybersecurity? ▪ CIA -triad ▪ Importance and Risks ▪ Common Threats: Malware, Phishing, Ransomware, Social Engineering ▪ Cybersecurity Best Practices	1. Identify different cyber threats using real-world examples 2. Install and run an antivirus scan 3. Create strong passwords using password managers 4. Enable and test multi-factor authentication (MFA) 5. Implement User Access Control (UAC) settings on a system 6. Identify safe vs. unsafe websites using browser security indicators

			Secure Authentication and Access Control ▪ Importance of Strong Passwords and ▪ Multi-Factor Authentication (MFA) ▪ Role of User Access Control and Privileged Accounts ▪ Password Management Tools **Safe Browsing and Data Protection** ▪ Secure Websites (HTTPS, SSL Certificates) ▪ Identifying Fake Websites and Links ▪ Basics of Encryption and Secure File Sharing ▪ Importance of Backups	7. Encrypt and decrypt a file using built-in OS tools 8. Set up and perform a basic data backup
4	**2**	**1, 4, 5, 7**	**Cyber security best practices** ▪ Awareness on cyber safety ▪ Do's and dont's w.r.t ▪ Password Management ▪ Safe Browsing and Email Habits ▪ Software and System Security ▪ Data Protection and Backup ▪ Social Engineering and Phishing Awareness ▪ Secure Mobile and IoT Devices ▪ Staying Safe from Online Predators, Cyberbullying and Cyber harassment, Using Social Networks Safely**.**	1. Spot Fake Websites and Phishing Emails 2. Analyze real vs. fake websites (check for HTTPS, domain names, security certificates). 3. Identify phishing emails (hover over links, check sender email, grammar errors). 4. Update and Patch Management a. Check if your OS and software are up to date (Windows Update, Linux apt upgrade). b. Test an antivirus scan and remove unnecessary apps. 5. Implement a Backup Strategy 6. Encrypt and Secure Sensitive Files 7. Recognizing Scam Calls and Messages
5	**3**	**1, 2, 3, 4, 7**	**Introduction to Problem Solving** ▪ What is problem-solving? ▪ Problem-solving cycle. ▪ Introduction to block-based coding (Scratch, Blockly, MIT App Inventor / Klaritree or similar tool).	1. Explore the interface of the block coding tool 2. Develop algorithms and draw flowchart ▪ for basic arithmetic operations. ▪ Metric conversions.

			▪ Understanding algorithms, flowcharts, and sequencing.	
6	**3**	**1, 2, 3, 4, 7**	What are variables? Storing and updating values. Using variables for score counters and timers. Basic Elements of Block-Based Coding: ▪ Motion Blocks ▪ Looks Blocks ▪ Events Blocks ▪ Control Blocks ▪ Operators Blocks ▪ Variables Blocks	1. Create a simple animated sequence (e.g., making a sprite move in Scratch). 2. Design a flowchart for a real-world task 3. Create a score counter for a simple game. 4. Develop an interactive greeting app that responds to user input.
7	**3**	**1, 2, 3, 4, 7**	**Decision Making** ▪ What are conditions? (if, if-else, nested if). ▪ Boolean logic (AND, OR, NOT). ▪ Applying conditional logic in games and applications.	1. Develop algorithms and draw flowchart to demonstrate comparison and logical operations (eg. Comparison of two number) 2. Create an interactive story with decision-making (yes/no choices). **3.** Build a traffic light simulator using conditional statements.
8	**3**	**1, 2, 3, 4, 7**	**Understanding Loops and Repetition** ▪ Importance of loops in coding. ▪ Types of loops (repeat, repeat until, forever). ▪ Practical use of loops in problem-solving.	1. Create a bouncing ball animation using loops. **2.** - Design a counting program that prints numbers from 1 to 20 using loops.
9	**4**	**1, 4, 7**	**Cloud Computing** ▪ What is **Cloud Computing**? ▪ **Cloud Computing** benefits and use cases ▪ Cloud service models (IaaS, PaaS, SaaS)	1. Create a free cloud account (AWS, Azure, or GCP) 2. Explore the cloud console and key services 3. Set up cloud storage and upload/download files 4. Create Online Forms and Surveys to capture data using cloud services
10	**4**	**1, 4, 7**	**Internet of Things (IoT)** ▪ What is IoT? ▪ Characteristics	1. Create a simple visual block code to blink LED in Arduino board using visual block code, upload code to Arduino board and demonstrate.

			▪ Components of IoT (Sensors, Actuators, Communication, Cloud, Analytics) ▪ Use Cases of IoT across various industries. ▪ Examples of IoT in everyday life	2. Create a Traffic signal controller with 3 LED (RED, YELLOW and GREEN), upload code to Arduino board and demonstrate. Note : Students and Teachers to use visual block code platform such as a. https://www.tinkercad.com/ b. https://mblock.cc for building IoT application and demonstration.
11	**4, 5**	**1, 4, 7**	**Artificial Intelligence** ▪ What is AI? ▪ Types of AI (Weak AI, Strong AI, General AI) ▪ AI in Everyday Life: Real-world applications ▪ AI Systems like prediction, recommendation ,etc. ▪ - AI Applications (Healthcare, Finance, Robotics, etc.)	Explore AI tools such as : ChatGPT, Deepseek, Gemini,Grok, Copilot, NapkinAI, Sora,etc
12	**5**	**1, 4, 7**	**Prompt Engineering** ▪ What is Prompt Engineering? ▪ Role of AI language models ▪ Types of AI prompts: Direct, Instructional, Conversational ▪ Understanding AI capabilities and limitations **Structuring Effective Prompts** ▪ Key principles of writing effective prompts ▪ Clarity, specificity, and context in prompts ▪ Role of tone, format, and constraints **Domain-Specific Prompting** ▪ Using AI for content creation (writing, marketing, coding) ▪ AI in education and research ▪ Customizing prompts for business applications	1. Exploring different AI models (ChatGPT, Claude, Bard) 2. Testing basic prompts and analyzing responses 3. Improving weak prompts 4. Experimenting with structured vs. unstructured prompts
13	**1, 2,**	**1, 7**	**IT Certifications and Career Paths**	**1.** Research and present a report on popular IT certifications.

	3, 4		▪ Overview of IT certifications (Entry-level to Expert) ▪ Importance of certifications in IT careers ▪ Choosing the right certification based on career goals (Networking, Security, Cloud, Development, etc.)	2. Identify career interests and match them with relevant certifications. 3. Develop a career roadmap with certification milestones.

4. References

Sl No	Description
1	*Computer Fundamentals* by P.K. Sinha (11th Ed.)
2	*Data Communications and Networking* by Behrouz Forouzan (5th Ed.)
3	*Cybersecurity for Beginners* by Raef Meeuwisse – Covers threats
4	*Coding for Kids: Scratch* by Jon Woodcock
5	***Cloud Computing** Basics* by Anders Lisdorf
6	*IoT for Beginners* by Adeel Javed
7	*Artificial Intelligence: A Guide for Thinking Humans* by Melanie Mitchell
8	*The Tech Career Guide* by Aki Ito
9	Learn Prompting
10	AI Playground
11	Tinkercad Circuits
12	Blockly Games
13	https://onlinecourses.swayam2.ac.in
14	https://www.geeksforgeeks.org
15	Essentials of Prompt Engineering | Coursera
16	https://www.ncerc.ac.in

5. Suggestive Online courses

Sl no	Topic Name	Reference Courses	Self Assessment Link	Source
1	**Cybersecurity**	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_014222737382490112870/overview		Coursera
2	**Security Attacks**	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013842495231705088165 31_shared/overview	https://infyspringboard.onwingspan.com/web/en/viewer/html/lex_auth_0138424974193704961598 2_shared?collectionId=lex_auth_0138424952317050881653 1_sharedandcollectionType=Course	IIHT
3	**Introduction to Problem Solving**	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013114932072439808168 5_shared/overview	https://infyspringboard.onwingspan.com/web/en/viewer/iap/lex_auth_013234465974222848743 2_shared?collectionId=lex_auth_013114932072439808168 5_sharedandcollectionType=Course	Infosys Wingspan
4	**Flowcharts**	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013501555913695232790 9/overview		Skillsoft

5	**Block coding**	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013177717283605708885_shared/overview	https://infyspringboard.onwingspan.com/web/en/viewer/html/lex_auth_013165205899452416510_shared?collectionId=lex_auth_013177717283605708885_sharedandcollectionType=Course	IIHT
6	Block coding	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013094404668416000169 3_shared/overview		IIHT
7	**Cloud Computing**	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_2924501508992264000 0_shared/overview	https://infyspringboard.onwingspan.com/web/en/viewer/iap/lex_auth_01268242367501107260_shared?collectionId=lex_29245015089922640000_sharedandcollectionType=Course	Infosys Wingspan
8	Internet of Things	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_215536228825219970 00_shared/overview	https://infyspringboard.onwingspan.com/web/en/viewer/iap/lex_12361814852557394000_shared?collectionId=lex_21553622882521997000_sharedandcollectionType=Course	Infosys Wingspan
9	Artificial Intelligence	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_8840337130015322000_shared/overview	https://infyspringboard.onwingspan.com/web/en/viewer/iap/lex_261056189367467100002000_shared?collectionId=lex_8840337130015322000_sharedandcollectionType=Course	Infosys Wingspan

6. CIE Assessment Methodologies

Sl.No	CIE Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1Theory Test	4	90	50	Average of all CIE=50 Marks
2.	CIE-2Practice Test	7	180	50	
3	CIE-3Theory Test	10	90	50	
4.	CIE-4Practice Test	13	180	50	
5	CIE-5 ▪ Portfolio evaluation (20) ▪ Online Course/s of minimum 10 Hrs. in Infosys Spring Board/ Swayam/NPTEL/AWS /any other (30)	1-13		50	
				Total	**50 Marks**

Note:

Portfolio evaluation

Each laboratory exercise will be evaluated for a total of 20 marks. The evaluation will include the following components:

- Written description of the experiment in the observation book.
- The results obtained from the experiment.
- Corrections and evaluations of the experiment completed in the previous class, documented in the record book.

The average of all exercises shall be considered for the final assessment at the end of course.

Rubrics for the Mini Project (if included) should be defined by the course coordinator.

7. SEE – Practice Assessment Methodologies

Sl.No	SEE – Practice Assessment	Duration (minutes)	Max marks	Min marks to pass
1.	Semester End Examination-Practice	180	50	20

8. Theory Test model question paper

Program	**Computer Science and Engineering**			**Semester -1**	
Course Name	**IT Skills**			**Test**	**III**
Course Code	**25CS01I**	**Duration**	**90 min**	**Marks**	**50**
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					

Q.No	Questions	Cognitive Level	Course Outcome	Marks
	Section - 1			
1	a. Explain the significance of the functional block diagram of a digital computer with a neat diagram. (5) b. Explain the evolution of computers through different generations, highlighting key technological advancements in each generation. (10) c. Explain the different types of networks (LAN, MAN, WAN) with suitable real-world examples. How do they differ in terms of scale and application?(10)	L2	1	25
2	a. Classify computers based on size and purpose. Provide one real-world use case for each type. (5) b. **Explain** how advancements in computer generations (from	L2	1	

	vacuum tubes to AI) have impacted business productivity. (10) c. Describe the client-server model using the example of an online banking website. (10)			
Section – 2				
3	a. *A friend unknowingly clicks a phishing link and shares their bank credentials. Using the CIA triad, explain the potential risks. Then, outline steps they should take immediately to mitigate damage. (10)* b. What is Multi-Factor Authentication (MFA)? How does it improve authentication security? Provide an example (8) c. Define Cybersecurity and explain the CIA Triad model. Why is it essential in today's digital world? (7)	L2	2	25
4	a. Describe the importance of password management tools. How do they contribute to secure authentication? Illustrate with examples of popular tools. (10) b. Explain how HTTPS and SSL certificates ensure secure browsing. How can users verify a website's security? (8) c. Compare phishing and ransomware attacks in terms of intent, delivery method, and impact. (7)	L2	2	
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.				

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

9. CIE Practice Test model question paper

Program	**Computer Science and Engineering**			**Semester**	**1**
Course Name	**IT Skills**			**Test**	**II**
Course Code	**25CS01I**	**Duration**	**180 min**	**Marks**	**50**
Name of the Course Coordinator:					

Questions	**CO**	**Marks**
You have been hired as an IT Support Specialist in a company. Your first assignment is to set up a secure computer system, connect it to a network, and develop a simple automated task using block-based coding. You are required to: a. Set up a computer system by identifying its hardware and software specifications. ▪ Find and document system details like CPU, RAM, storage, and operating system. ▪ Identify whether the installed software is system software or application software. b. Configure network settings and verify the internet connection. ▪ Retrieve and document the IP address, MAC address, and default gateway. c. Ensure cybersecurity best practices to protect the system and online accounts. d. Develop a simple program using block-based coding (Scratch, Blockly, or MIT App Inventor) to automate a basic task. ▪ Create an interactive quiz that asks a user three questions and gives feedback on their answers. OR ▪ Develop a program where a sprite moves when arrow keys are pressed.	**2**	**50**
Scheme of assessment Computer System Setup - 10 Network Configuration and Internet Connectivity - 10 Cybersecurity Best Practices – 10 Block-Based Coding - 20		
	Total Marks	**50**

Sign of the Course Coordinator **Signature of the HOD**

10. SEE- Model Practice Question Paper

Program	Computer Science and Engineering		Semester	1
Course Name	IT Skills	Course Code : 25CS01I	Duration	180 min
Questions			**CO**	**Marks**
As an IT specialist, you are tasked with setting up a secure digital environment for a small business. You must: a. Configure and document the computer hardware and software specifications of a system. b. identify the IP and MAC addresses and enable basic security settings. c. identify phishing threats and implement Multi-Factor Authentication (MFA). d. Develop a simple interactive program using block-based coding that automates a basic business task of greeting customers e. Use AI tools to generate a business report and refine the output using effective prompt engineering techniques. i.			**1,2,3,5**	**50**
Scheme of assessment a. System setup - 10 b. Cybersecurity Measures - 10 c. Block-Based Coding and Algorithmic Thinking - 10 d. Report Submission and Presentation - 20				
			Total Marks	**50**

1.Signature of the Examiner **2. Signature of the Examiner**

11. Equipment/software list with Specification for a batch of 30 students

Sl.No.	Particulars	Specification	Quantity
01	Desktop/Laptop PC with Windows/Linux	Intel i3, 500GB Hard Disk/SSD, 8GB RAM, Monitor, Mouse, Keyboard or higher configuration	30
02	Internet Connection	100 Mbps speed or higher subscription	1
03	LAN connectivity/ High speed Wireless AP	32 Port Switch with LAN cabling/ Wifi Adapters (32 No.)	1
04	Online UPS	5KV with 3 -6 hours backup	1
05	Projector	Multimedia Projector	1

Government of Karnataka

DEPARTMENT OFTECHNICAL EDUCATION

Curriculum Structure

II Semester Scheme of Studies

Sl. No.	Teaching Department	Course Code	Course Name	Hours per week			Total Contact Hours/week	Credits	CIE Marks		Theory SEE Marks		Practice SEE Marks		Total Marks
				L	T	P			Max	Min	Max	Min	Max	Min	
Integrated Courses															
1	SC	25SC21I	Engineering Mathematics-II	4	0	4	8	6	50	20	50	20	-	-	100
2	ENG	25EG01I	Essential English Communication	4	0	4	8	6	50	20	-	-	50	20	100
3	ME	25ME02I	Computer Aided Engineering. Graphics	3	0	4	7	5	50	20	-	-	50	20	100
4	EC	25EC21I	Applied Electronics-1	4	0	4	8	6	50	20	50	20	-	-	100
Audit Course															
5	EC	25EC22T	Indian Constitution	2	0	0	2	2	50	20	-	-	-	-	50
6	Personality Development		NCC/NSS/YOGA/SPORTS…	Students are expected to engage in any one of these activities from 1st semester to 6th semester (No Credits)											
			Total	**17**	**0**	**16**	**33**	**25**	**250**	**-**	**100**	**-**	**100**	**-**	**450**

Government of Karnataka
Department of Technical Education

C-25 Diploma Curriculum

Engineering Mathematics for Engineering Programmes

Second semester

(Effect from the AY 2025-26)

Government of Karnataka

DEPARTMENT OF TECHNICAL EDUCATION

Curriculum Structure

II Semester Scheme of Studies- Diploma in _____Engineering

Sl. No.	Teaching Department	Course Code	Course Name	Hours per week			Total Contact Hours /week	Credits	CIE Marks		Theory SEE Marks		Practice SEE Marks		Total Marks
				L	T	P			Max	Min	Max	Min	Max	Min	
Integrated Courses															
1	SC	24SC21I	Engineering Mathematics-II	4	0	4	8	6	50	20	50	20	-	-	100

L: Lecture: T: Tutorial: P: Practice: **SC-Science: Theory (Whole Class)::Practical(Batch wise)::I-Integrated (Both theory & Practice-Batch wise)**

- *For Engineering Mathematics-II, Theory for whole class and Practice batch wise.*

Integrated Course Template (T+P)

Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	Engineering	**Semester**	II
Course Name	Engineering Mathematics-II	**Type of Course**	Integrated
Course Code	**25SC21I**	**Contact Hours**	8 hours/week (104 hours/semester)
Teaching Scheme	L: T:P- 4:0:4	**Credits**	6
CIE Marks	50	**SEE Marks**	50

1. Rationale:
This course is designed to give a comprehensive coverage at an introductory level to the subject of Straight Lines, Differential Calculus and Applications, Integration and Definite Integrals and Applications.

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

CO-01	Identify the various linear models and interpret the visualizations in MS excel and GeoGebra
CO-02	Apply the basic rules of differentiation.
CO-03	Apply the basic concepts of differentiation in one dimensional motion of a particle and compares the actual results with the results obtained at GeoGebra.
CO-04	Evaluate the integrals with basic integrands and compares results with the results obtained at GeoGebra.
CO-05	Evaluate definite integrals pertaining to area and volume. Also Compares the results with the result obtained at GeoGebra.

3. Course Content

WEEK	CO	PO (L3-highly mapped)	Theory (4 Hours per week)	Practice (4 Hours per week)
1	1	1,4,7	**Straight Lines: -** Introduction of Slope ($m = \tan\theta$) and Intercepts of a straight line, Problems	**Practice-1:** To find the slope of randomly drawn straight lines on a graph sheet manually for minimum 5 straight lines.
	1	1,4,7	Different forms of equation of straight lines (without proof), a) Slope – Intercept form b) Slope – Point form c) Two-point form d) Intercepts form Problems on Slope – Intercept form	

	1	**1,4,7**	Problems on Slope – Point form (one point form)	**Practice-2:** To visualize the sign convention of the slopes of the straight lines manually on a graph sheet.
	1	**1,4,7**	Problems on Two-point form	
2	**1**	**1,4,7**	Problems on Intercepts form	**Practice-4:** Collect two variable data (online or off line) and obtain the linear approximation for the same in MS Excel. Hence interpolate or extrapolate few data.
	1	**1,4,7**	Problems continued on above forms	
	1	**1,4,7**	General form of equation of straight line (ax+by+c=0). Finding slope, x-intercept and y-intercept of a line	**Practice-5:** Plot minimum 3 straight lines at GeoGebra graphing calculator and compare the results with theoretical inferences.
	1	**1,4,7**	Conditions for two straight lines to be parallel & perpendicular and Problems	
3	**1**	**1,4,7**	Equation of a straight line parallel to the given straight line and passing through a point and Problems	**Practice-6:** To visualize and record the data gathered by the straight lines plotted at GeoGebra graphing calculator**.** Hence conclude the conditions for parallelism and perpendicularity of lines(y=mx+c).
	1	**1,4,7**	Problems continued	
	2	**1,4,7**	**DIFFERENTIAL CALCULUS: -** Definition of derivative. Derivative of Constant(K), x^n by the method of first principle.	**Practice-7**: Introduction to CAS (Computer Algebra System) tool in GeoGebra.
	2	**1,4,7**	Derivative of e^{ax} by the method of first principle.	
4	**2**	**1,4,7**	List of standard derivatives (Algebraic, trigonometric, exponential and logarithmic).	**Practice-8:** To verify the method of first principles in MS excel constraint to $f(x) = x^2$ and $f(x) = x^3$ at x=1.
	2	**1,4,7**	Derivative of a function with scalar multiple. Sum rule of differentiation. Difference rule of differentiation	
	2	**1,4,7**	Problems continued.	**Practice-8:** Find the derivatives of the standard functions in GeoGebra.
	2	**1,4,7**	Product rule of differentiation. (product of two functions)	
5	**2**	**1,7**	Product rule of differentiation. (product of three functions)	**Practice-9:** Find the derivatives of the sum and the difference in GeoGebra. Compare the result with the theoretical inference.
	2	**1,7**	Quotient rule of differentiation.	
	2	**1,7**	Composite rule (chain of two functions only) of differentiation.	**Practice-10:** Find the derivatives of product functions in GeoGebra. Compare the result with the theoretical inference.
	2	**1,7**	Problems on Composite rule.	
6	**2**	**1,4,7**	Successive differentiation up to second order and simple problems	**Practice-11:** Find the derivatives of quotient functions in GeoGebra. Compare the result with the theoretical inference.
	2	**1,4,7**	Problems continued	

	3	**1,4,7**	**Applications of Derivatives:** Tangent: Finding the slope of tangent to the curve.	**Practice-12:** To derive the equations of tangent at three distinct points from the plots obtained in GeoGebra.
	3	**1,4,7**	Equation of the tangent to the curve at a point and problems.	
7	**3**	**1,4,7**	Normal: Finding the slope of Normal to the curve.	**Practice-13:** To derive the equations of normal at three distinct points from the plots obtained in GeoGebra.
	3	**1,4,7**	Equation of the Normal to the curve at a point and problems.	
	3	**1,4,7**	Derivative as a rate measure: Velocity of a particle or a body and problems	**Practice-14:** To determine the velocity and acceleration for well-defined distance function and tabulate the velocity and acceleration in an interval in GeoGebra.
	3	**1,4,7**	Problems continued on velocity of a particle or a body	
8	**3**	**1,4,7**	Acceleration of a particle or a body and problems	
	3	**1,2,4,7**	Problems continued on acceleration of a particle or a body	
	4	**1,2,4,7**	**Integral calculus**:- Definition of Integration and list of formulae (Algebraic, trigonometric and exponential)	**Practice-15:** Evaluate the standard integrals in GeoGebra.
	4	**1,2,4,7**	Rules of integration (without proof) with examples	
9	**4**	**1,4,7**	Problems on Rules of integration for algebraic functions	**Practice-16:** Evaluate the integrals with the integrands as sum and difference of all functions in GeoGebra.
	4	**1,4,7**	Problems continued	
	4	**1,4,7**	Problems involving trigonometric functions	
	4	**1,4,7**	Problems continued	
10	**4**	**1,4,7**	Integration by substitution method of the forms $\int f(x)^n f'(x)\,dx$, $\int \frac{f'(x)}{f(x)}dx$ simple problems	**Practice-17:** Evaluate the integrals with the integrands as product of algebraic and trigonometric (ILATE) in GeoGebra. Compare the result with the theoretical inference.
	4	**1,4,7**	Problems on integration by substitution method	
	4	**1,4,7**	Problems on integration by substitution method continued	
	4	**1,4,7**	Integration by parts:(ILATE RULE) $\int x\sin x\,dx$, $\int x\cos x\,dx$	
11	**4**	**1,4,7**	Integration by parts: $\int x\sec^2 x\,dx$, $\int x\,\mathrm{cosec}^2 x\,dx$, $\int x e^x dx$	**Practice-19:** Evaluate the integrals with the integrands as product of algebraic and exponential functions (ILATE) in GeoGebra. Compare the result with the theoretical inference.
	4	**1,4,7**	Integration by parts: $\int \log x\,dx$, $\int x\log x\,dx$, $\int x^2 \log x\,dx$	

	5	**1,2,4,7**	**Definite Integrals and Applications:-** Definition and simple problems on definite integrals	**Practice-20:** Evaluate the integrals with the integrands as product of algebraic and logarithmic functions (ILATE) in GeoGebra. Compare the result with the theoretical inference.
	5	**1,2,4,7**	Problems on definite integrals of algebraic functions	
12	**5**	**1,2,7**	Problems on definite integrals of trigonometric functions	**Practice-21:** To evaluate the area under the given curve and the volume generated by rotating the curve y=f(x) about x -axis in GeoGebra.
	5	**1,2,7**	Problems on definite integrals using substitution method	
	5	**1,2,7**	Problems continued	
	5	**1,2,7**	Problems continued	
13	**6**	**1,2,4,7**	**Applications of Integration**: Simple problems on finding the area bounded by the curve and x – axis. Problems.	**Practice-22:** Visualization Solids generated by rotating the curves about fixed axes in GeoGebra. (DEMONSTRATION)
	6	**1,2,4,7**	Problems continued.	
	6	**1,2,4,7**	Finding the volume of solid generated by revolving the curve about x – axis. Problems	
	6	**1,2,4,7**	Problems continued.	

4. References:

1. Higher Engineering Mathematics by B. S. Grewal, Khanna Publishers, New Delhi.
2. Engineering Mathematics by Reena Garg, Khanna Publishing House, New Delhi.
3. Calculus and Analytical Geometry by G. B. Thomas and R. L. Finney, Addison and Wesley Publisher.
4. NCERT Mathematics Books of Class XI and XII.
5. Deepak Singh, Mathematics-I, Khanna Book Publishing Co. (P) Ltd.
6. Garima Singh, Mathematics-II, Khanna Book Publishing Co. (P) Ltd.

Web-based/Online Resources:

i) https://www.youtube.com/watch?v=Yp-RERSe8Yk – To find derivatives using CAS in GeoGebra
ii) https://www.youtube.com/watch?v=1Cu4iw6jv6Y –To plot tangent to the curve in GeoGebra
iii) https://www.youtube.com/watch?v=sh5KutnKo9Q – To evaluate indefinite and definite integrals
iv) https://www.youtube.com/shorts/ZNCBgVjgPDY - To demonstrate the solid of revolution.

5. CIE and SEE Assessment Methodologies

Sl.No	Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1 Theory Test	4	90	50	Average of all CIE=50 Marks
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3 Theory Test	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total Continuous Internal Evaluation (CIE)					50 Marks
Semester End Examination (SEE) -Theory			180	100	50 (100 marks scaled down to 50 marks)
				Total Marks	**100 Marks**
Minimum marks to pass in CIE & SEE is 40% individually					

6. CIE Theory Test:

CIE 1(at the end of 4th week)

Program	**_____ Engineering**		**Semester**	**II**
CourseName	Engineering Mathematics-II		**Marks**	**50**
Course Code	**25SC21I**		**Duration**	**90 min**

Section A
(Answer any seven questions, each question carries 5 marks)

Q. No.	Questions	CL	CO	PO
1			1	
2			1	
3			1	
4			1	
5			1	
6			1	
7			1	
8			1	
9			1	
10			1	
Section B **(Answer any three questions, each question carries 5 marks)**				
11			2	
12			2	
13			2	
14			2	
15			2	

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

CIE 3(at the end of 10th week)

Program	**_____ Engineering**	**Semester**	**II**
CourseName	Engineering Mathematics-II	**Marks**	**50**
Course Code	**25SC21I**	**Duration**	**90 min**

Section A **(Answer any two questions, each question carries 5 marks)**				
Q. No.	**Questions**	**CL**	**CO**	**PO**
1			2	
2			2	
3			2	
Section B **(Answer any three questions, each question carries 5 marks)**				
4			3	
5			3	
6			3	
7			3	
8			3	
Section C **(Answer any five questions, each question carries 5 marks)**				
9			4	
10			4	
11			4	
12			4	
13			4	
14			4	
15			4	
16			4	

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

7. CIE Practice Test

Program	**Engineering**			**Semester**	**II**
CourseName	Engineering Mathematics-II			**Test**	**II/IV**
Course Code	**25SC21I**	**Duration**	**180 min**	**Marks**	**50**
Name of the Course Coordinator:					
Questions				**CO**	**Marks**
a. **OR** **b.**					**50**
Scheme of assessment **a) Observation** **b) Conduction** **c)Result and Output** **d) Viva**					**10** **20** **10** **10**
				Total Marks	**50**

Note: ***For CIE-II Practice Test : 01 to 12 : For CIE – IV Practice Test : 13 to 22***

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

8. Suggestive Activities:

The List is only shared as an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevant to the topic and on the availability of such resources at their institution.

Note: Minimum 3 suggested activities should be done.

Sl. No.	Suggestive Activities
01	Write the application of system of linear equations in real life with neat diagrams and printed pictures.
02	Plot both standard functions and their derivatives in GeoGebra and document the plots obtained.
03	Plot the graphs for different f(x) in any GeoGebra graphing tool and record the maxima and minima at different interval and submit in the document with neat pictures.
04	Apply the concept of derivatives to study the rate measure like velocity, acceleration and retardation etc.
05	Apply CAS tool in Geogebra to find the area between any two arbitrary curves and present the graphical inferences obtained.

9. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		2	4	6	8	10	
1	Knowledge	Poor knowledge About the subject	Normal knowledge about the subject	Good knowledge about the subject	Very good knowledge about the subject	Excellent knowledge about the subject	10
2	Problems solving ability	Solved minimum number of problems with maximum mistakes	Solved minimum number of problems	Solved problems with few mistakes	Solved maximum number of problems	Solved all problems in neat manner	10
3	Strategies and Procedure	Hardly uses an effective strategy to solve problems.	Rarely uses an effective strategy to solve problems.	Sometimes use an effective strategy to solve problems but does not do it consistently.	Typically, uses an effective strategy to solve the problem(s).	Typically, uses an efficient and effective strategy to solve the problems	8
4	Completion	Several of the problem are not completed	Only 30% of thequestion are answered correctly	Only 50% of thequestions are answered correctly	Only 75% of the questions areanswered correctly	All assignment questions are answered correctly	8
5	Neatness and Organization	The work appears sloppy and unorganized. It is hardly to know what information goes together.	The work appears sloppy and unorganized.	The work is presented in an organized fashion but may be hard to read at times.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in a neat, clear, organized fashion that is easy to read.	6
	Total Marks= 10+10+8+8+6 =42						**42**

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

11. Equipment/software list with Specification for a batch of 30 students

Sl. No.	Particulars	Specification	Quantity
01	Computers	12th Generation, Intel Core I3, Graphic card, RAM 16GB, Storage: 1TB	30
02	Operating System and Software	Windows 10, MS Office, MS excel, GeoGebra	For all PC
03	Internet	High speed Internet	For all PC
04	Printer	Wireless Multifunctioning printer	05
05	Projector	High resolution, wifi enabled	01
06	UPS	As per standards	6KV

Practice Problems:

***Straight Lines*:**

1. Find the equation of line passing through the point $(3,4)$ having slope 5.
2. Find the equation to the straight line cutting off y – intercept 5 units and making an inclination 135°.
3. Find the slope of straight line whose inclination with x – axis is 45^{0}.
4. Find the slope of line passing through the points $(2,4)$ and $(8,7)$.
5. Find equation of straight line whose slope is 3 units and y - intercept is 4.
6. Find the equation of straight line passing through the point $(-3,9)$ and having the slope -1.
7. Find the equation of the straight line passing through $(2,3)$ and having slope 5.
8. Find the equation of line passing through the point $(6,8)$ and having slope 2.
9. Write the standard form of equation of straight line with
   a) One point (x_1, y_1) having slope m.
   b) Two points (x_1, y_1) and (x_2, y_2).
10. Find the equation of line joining the points $(3,2)$ and $(-1,5)$.
11. Find the equation of straight line passing through two points $(2,5)$ and $(3,7)$.
12. Find the equation of straight line passing through two points $(0,5)$ and $(4,6)$.
13. Find the equation to the straight line passing through the point $(5,2)$ and $(-3,3)$, hence find the slope of the line.
14. Find the equation to the straight line passing through the point $(4,-3)$ and $(2,1)$.
15. Write the standard form of straight line
    a) General form
    b) Having slope m and y - intercept c.
16. Find equation of straight line passing through the point $(1,2)$ which makes an angle 45^{O} to the x - axis.
17. Find the equation of straight line passing through the point $(1,2)$, which is parallel to the line $2x-3y+1=0$.
18. Find the equation to the straight line passing through the point $(4,3)$ and parallel to the line $3x+5y-3=0$.
19. Find equation of line parallel to $2x+y-3=0$ which passes through the point $(2,3)$.

20. Find the equation to the straight line passing through the point $(5,2)$ and parallel to $4x-3y+1=0$.
21. Find equation of straight line passing through the point $(5,6)$ and having slope of 3 units by writing its standard form.
22. Find the equation of straight line whose x- intercept and y- intercepts are 3 and 4 units respectively
23. Show that the two lines $2x+y-4=0$ and $6x+3y+10=0$ are parallel.
24. Show that the lines $3x+2y-1=0$ and $2x-3y+5=0$ are perpendicular.
25. Find the value of *k*, if the lines $(14+k)x+4y-3=0$ and $8x-3y+1=0$ are perpendicular.
26. Find the equation of the line passing through the point $(-3,2)$ and parallel to the line $4x-y+7=0$.
27. Find equation of line passing through the point $(1,2)$ and parallel to the line $2x-3y+1=0$
28. Find equation of line passing through the point $(2,3)$ and parallel to the line $5x-4y+4=0$.
29. Find the slope and x- intercept of line $3x+4y+7=0$.
30. Find the intercepts of the line $3x+5y-15=0$
31. Find x- intercept and y- intercept of line $2x+4y+5=0$.
32. Find the slope, *x*-intercept and *y*-intercept of the line $2x+3y-11=0$.

***Differential Calculus*:**

1. If $y=x^3+3\cos x+4e^x+2$ then find $\frac{dy}{dx}$
2. If $y=e^x+7^x-4\log x+\tan x$ then find $\frac{dy}{dx}$
3. If $y=e^{2x}+\cos x+3\log x-\frac{1}{x}+\sin^{-1}x+3$ then find $\frac{dy}{dx}$
4. If $y=x^3+\sin x-\log x-\sqrt{x}+\tan^{-1}x+5$ then find $\frac{dy}{dx}$
5. If $y=xe^x$ then find $\frac{dy}{dx}$
6. If $y=2x^3+3x^2+5x$ then find $y_1(0)$.
7. If $y=3e^{3x}+\frac{3}{x}-4\cos x+\log x$ find $\frac{dy}{dx}$.
8. Find $\frac{dy}{dx}$ if $y=6x^3-3\cos x+4\cot x+2e^{-x}-\frac{5}{x}$
9. If $y=x^2+2x+3$ then find $\frac{d^2y}{dx^2}$
10. If $y=\log(\sin x)$ then find $\frac{dy}{dx}$
11. If $y=\log(\sec x+\tan x)$ then find $\frac{dy}{dx}$.
12. Find $\frac{d^2y}{dx^2}$ *at* $x=\pi$ given that $y=\sin x$.
13. Differentiate $\log\sqrt{x}$ w.r.t x.
14. Differentiate $\sin^2 x$ w.r.t x.

15. If $y = \sqrt{\cos x}$ then find $\frac{dy}{dx}$.

16. Find $\frac{dy}{dx}$ given that $y = x \log x$.

17. If $y = x \sin x$ then find $\frac{dy}{dx}$.

18. If $y = \frac{1+x^2}{1-x^2}$ then find

19. If $y = \frac{1+\sin x}{1-\sin x}$ then find $\frac{dy}{dx}$.

20. If $y = \frac{2+x}{2-x}$ find $\frac{dy}{dx}$.

21. If $y = e^{3x} + e^{-2x}$ then find $\frac{d^2y}{dx^2}$.

22. If $y = A\cos mx + B\sin mx$ then prove that $\frac{d^2y}{dx^2}$ at $x = 0$

23. If $y = ae^{x} + be^{-x}$ then prove that $\frac{d^2y}{dx^2}$ at $x = 0$.

Applications of differential calculus:

24. Find the equation to the tangent to the curve $y = 2x^2 - 3$ at $(1,3)$.

25. Find the equation to the tangent to the curve $y = 3x^2 + 4x$ at $(1,2)$.

26. Find the equation to the normal to the curve $y = x^2 + 1$ at $(1,2)$.

27. Find the equation of the normal to the curve $y = 2x^3 - 5x^2 + 8x - 6$ at the point $(1,-1)$.

28. Find the slope of the tangent to the curve $y = x^2 - 3x + 2$ at (1, 0).

29. Find slope of tangent and normal to the curve $y = x^3 - x$ at the point $(2,3)$

30. Find equation of tangent to the curve $y = x^2 + x$ at the point $(1,2)$

31. The displacement of a particle moving along a straight line is $S = t^3 - 2t^2 - 4t + 20$ meters. Find the velocity when t=3 secs.

32. The equation of motion is given by $S = 3t^2 + 4t + 6$, find the velocity after 2 seconds.

33. The equation of motion of the particle is $S = t^3 - 2t^2 + 4$ in meter. Find the velocity when $t = 2$ seconds.

34. The displacement of a particle *S* meters moving along a straight line is $S = 4t^3 - 2t^2 + t$. Find the velocity when $t = 2$ secs.

35. If $S = 6t^3 - 5t^2 + 4$ is the displacement of a particle in time *'t'* sec, find its velocity at $t = 2$ sec.

36. The displacement of a particle in time *'t'* seconds is given by $s = t^3 - 6t^2 - 8$. Find the velocity after 3 seconds.

37. If s is the distance traversed in meters by a particle in time t sec and $s = 4t^3 - 6t^2 + t - 7$, find the velocity and acceleration when t=2 sec.

***Integration*:**

1. Integrate $e^x + \frac{1}{1+x^2} - \sin x + x^3$ w .r. t. x
2. Integrate $\sec^2 x - e^{4x} + x^5 - \frac{1}{x}$ w .r .t. x
3. Integrate $x^4 - e^{-2x} + \cos x - 100$ w .r .t. x
4. Evaluate $\int \left(\sin 2x + \frac{2}{x} + e^x + 3\sec^2 x + 5 \right) dx$.
5. Evaluate $\int \left(x^2 (1+x) \right) dx$
6. Evaluate $\int (x \log x)\, dx$
7. Evaluate $\int cos^2 x\, dx$
8. Evaluate $\int sin^3 x\, dx$
9. Evaluate $\int \frac{2x+1}{x^2+x+1} dx$
10. Evaluate $\int (x^2 + x + 9)^{10} (2x+1) dx$
11. Evaluate $\int \frac{e^x}{1+e^x} dx$
12. Evaluate $\int \frac{1-\cos 2x}{\sin 2x} dx$
13. Evaluate $\int \frac{(x+1)(x-5)}{x} dx$
14. Evaluate $\int \frac{2x-4}{x^2-4x+11} dx$
15. Evaluate the integral $\int x\, e^x\, dx$ using integration by parts.
16. Evaluate the integral $\int x\, sinx\, dx$ using integration by parts.

***Definite Integrals and Applications*:**

1. Evaluate $\int_0^1 (2x+1)(x-3)\, dx$
2. Evaluate $\int_0^{\pi/2} \sin^3 x dx$.
3. Evaluate $\int_0^{\pi/2} \cos^3 x dx$.
4. Evaluate $\int_0^{\pi/2} \sin x dx$.
5. Evaluate. $\int_0^1 x e^x dx$
6. Evaluate $\int_0^1 (x+2)(x-5)\, dx$.

7. Evaluate $\int_0^1 \left(3x - 6x + 2\right) dx$
8. Show that $\int_0^{\frac{\pi}{4}} tan^2 x \ sec^2 x \, dx = \frac{1}{3}$.
9. Find the area bounded by the curve $y = 3x$, the x – axis and the ordinates between $x = 1$ and $x = 2$.
10. Find the area bounded by the curve $y = x - 5$, the x-axis, the coordinates between $x = 0$ and $x = 5$.
11. Find the area bounded by the curve $y = x^2 + 1$, x-axis and the ordinates $x = 1$, $x = 3$.
12. Find the area bounded by the curve $y = 4x^3$, x – axis and the ordinates $x = 0$ and $x = 2$.
13. Find the area bounded by the curve $y = 3x^2 + 2x$, x – axis and ordinates $x = 0$ and $x = 1$.
14. The curve $y^2 = x + 2$ is rotated about x –axis .Find the volume of solid generated by revolving the curve between $x = 2$ & $x = 5$.
15. With the use of definite integrals find the area bounded by the curve $y = x^3 - 2$, x-axis and $x = 0$ & $x = 1$.
16. Find the area bounded by the curve $y = 4x - x^2 - 3$, x-axis and ordinates $x = 1$ and $x = 3$
17. Find the volume generated by rotating the curve $y^2 = x^3 - 2$ above x-axis between coordinates $x = 0$ and $x = 2$.
18. Find the volume generated by rotating the curve $y = x + 2$ about x – axis between $x = 0$ and $x = 2$.
19. Find the volume of the solid generated by revolving the curve $y^2 = 3x^2 - 2x + 1$ about x – axis and ordinates $x = 0$ and $x = 2$.
20. Find the volume of the solid generated by rotating the curve $y = x + 1$ about x – axis between $x = 0$ and $x = 2$.

Government of Karnataka
Department of Collegiate and Technical Education

C-25
Diploma Curriculum
COMMON TO ALL ENGINEERING AND NON-ENGINEERING PROGRAMMES EXCEPT COMMERCIAL PRACTICE

(Effective from the AY 2025-26)

ESSENTIAL ENGLISH COMMUNICATION: 25EG01I

Government of Karnataka

DEPARTMENT OF COLLEGIATE AND TECHNICAL EDUCATION

Curriculum Structure

I/II Semester Scheme of Studies - Common to all Engineering and Non Engineering Programmes except Commercial Practice

Sl. No	Teaching Department	Course Code	Course Name	Hours per week			Total Contact Hours /week	Credits	CIE Marks		Theory SEE Marks		Practice SEE Marks		Total Marks
				L	T	P			Max	Min	Max	Min	Max	Min	
Integrated Courses															
1	ENGLISH	25EG01I	Essential English Communication	4	0	4	8	6	50	20	-	-	50	20	100

L: Lecture: T: Tutorial: P: Practice: **I-Integrated (Theory, Tutorial & Practice-Batch wise classes mandatory)**

Government of Karnataka

DEPARTMENT OF COLLEGIATE AND TECHNICAL EDUCATION

Program	**Common to all Engineering and Non Engineering Programmes Except Commercial Practice**	**Semester**	**I/II**
Course Name	Essential English Communication	**Type of Course**	Integrated
Course Code	**25EG01I**	**Contact Hours**	8 hours/week (104 hours/semester)
Teaching Scheme	L:T:P - 4:0:4	**Credits**	6
CIE Marks	50 (Practice + Theory Test)	**SEE Marks (Practice)**	50

1. Rationale:

Effective Communication is an important life skill. The process of exchange of information happens vocally (verbal exchanges), through written media (books, websites, and magazines), visually (using graphs, charts, videos and maps), non-verbally (body language, gestures, pitch of voice, and tone) or even electronically (mails, messages, posts). Awareness of, and expertise in basic communication tools, as well as the ability to make use of it in English, is a quality that is bound to open a plethora of doors for a serious learner looking to craft a successful career.

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

CO-01	Effectively read from a printed text, internet and other sources; understand and explain it in different written formats and contexts, adhering to the general rules of grammar and syntax
CO-02	Confidently listen to, perceive and comprehend audio-visual information and use verbal and nonverbal attributes to speak about them
CO-03	Persuasively present cogent, relevant and independent thought and analysis, using latest technological tools

VERY IMPORTANT

CO 1 is attained through learning and assessment of textual questions, composition and comprehension exercises.
CO 2 is accomplished through learning and assessment of listening and speaking skills. Use of audiovisual media is compulsory to fulfil this.
CO 3 is achieved through learning and assessment of presentation skills using modern technological tools. Use of computers, office tools and internet is mandatory.

3. Course Content (Based on the textbook **ESSENTIAL ENGLISH COMMUNICATION FOR POLYTECHNICS** prescribed by DTE; available on the department website**)**

WEEK	CO	PO	Lecture (Theory)	Methodology for Practice	Content for Practice
1	**1, 3**	**6, 7**	**THE INSPIRATIONAL STORY OF ELON MUSK**	Students will share their experiences on and expectations from their community leaders and model personalities	Use of Computers, Internet and Software as tools of Communication Online Newspaper Reading Individual Profile Creation and Resume Preparation using Word tools
2	**1, 3**	**6, 7**	**THE INSPIRATIONAL STORY OF ELON MUSK** Composition (Narrative Writing)	Students will sit in groups of five and discuss the difference between leaders and bosses. Each group shall note down ten points of difference based on the discussion	Building Social Media Profile (LinkedIn, X, Facebook/Instagram)
3	**1, 2, 3**	**6, 7**	**AN EXCERPT FROM OORU KERI**	**ACTIVITY No. 1 for Portfolio Evaluation** Shall be a group activity on topics related to basic English grammar: viz Parts of Speech,	Listening Skills (I Have a Dream - Martin Luther King Jr (https://www.youtube.com/wa

			Composition (Expository Writing) Composition (Descriptive Writing)	Auxiliary verbs and Tenses. Should involve Practical demonstration/ along with a written/printed report/portfolio.	tch?v=qHc3FY9il1s) Sachin Tendulkar's Retirement Speech (https://www.youtube.com/watch?v=joZZyUXU7Bg) Shashi Tharoor's words on anti-colonialism (https://www.youtube.com/watch?v=f7CW7S0zxv4&t=274s) The Great Dictator - Speech (https://www.youtube.com/watch?v=w8HdOHrc3OQ&t=98s) Dananjaya Hettiaracchi - I see something (https://www.youtube.com/watch?v=bbz2boNSeL0&t=169s) Srikanth Bolla (https://www.youtube.com/watch?v=hxS5He3KVEM) Tryst with Destiny https://youtu.be/lrEkYscgbqE?si=U4M_uOH3SXR_8Rf- Ted talk Shah Rukh Khan https://youtu.be/0NV1KdWRHck?si=WOcw6_aX_rvYLSGS Winston Churchill " We shall fight on the beaches." https://youtu.be/skrdyoabmgA?si=zlzVI-ZMTfnFAYw1 Greta Thunberg's speech made at UN Climate summithttps://youtu.be/u9KxE4Kv9A8?si=NSBAL6z7DX_eTWiF Gururaj Karjagi's Motivational speech https://youtu.be/Dzj6TGwwNhg?si=CIbQsDOlEqGisynq
4	**1, 2, 3**	**6, 7**	**AN EXCERPT FROM OORU KERI**	Students in groups of five will talk to the class about any three local festivities, fairs or traditional practices	Speaking Skills Story Narration, Self Introduction, Asking questions based on a given text or a demo video, Self Justification, Theme based arguments, group discussions, extempore speech, elocution.
5	**1, 2**	**6, 7**	**THE SECRET OF THE MACHINES**	Students will debate the pros and cons of mechanisation in the rural areas of India	Technical Jargon – Engineering and Non-Engineering based-subject specific product labels, user manuals, technical/product brochures, sales pamphlets Agile **Non Engineering:** CAFM, CMMS, Compliance, Hot Dealing, ITSM, Hybrid Office, SaaS, Invoice, Indent, Challan, USP, CMS, CMR, TOFU, MOFU, BOFU, Cash cow, Appraisal, Attrition, Sabbatical, Benchmark

6	**1, 3**	**6, 7**	**THE SECRET OF THE MACHINES** Concept Development Note making, Circulars, Announcements, Notifications, Minutes of Meeting etc	Students will bring a few sales brochures to the class and evaluate their effectiveness in communicating the intended message. They will discuss the pros and cons and suggest required changes.	Branch specific product/service pitches/campaigns using PPT tools. Online communication tools - etiquettes of online communication - Do's and Don't s. Use of google forms for data collection and analysis
7	**1, 3**	**6, 7**	**CYBERCRIME**	Students will go through the following links: ✕Most Common Mistakes | Spoken English Connection by Kanchan Ma'am - YouTube Kids Identify and discuss common mistakes in English usage. They will highlight funny and embarrassing situations that might arise due to such errors.	Use of Artificial Intelligence tools in imbibing communication skills, Identification of spam, phishing and Trojan mails Introduction to deep fakes
8	**1, 3**	**6, 7**	**CYBERCRIME** Concept Development using AI tools : Official Communication - Notices, Memo etc, Vocabulary Building	**ACTIVITY No. 2 for Portfolio Evaluation** Shall be a group activity based on topics related to basic English grammar viz: Subject-Verb Agreement, Voices, Homophones, Homonyms and Homographs. Should involve Practical demonstration/ along with a written/printed report/portfolio.	Technical/Professional Writing through Word and PowerPoint using AI Tools
9	**1, 3**	**6, 7**	**CLIMATE CHANGE – A CONVERSATION**	Students will watch the *Shovel scene* from *The Gold Rush* (https://www.youtube.com/watch?v=cMZy1rB8naw) and relate it to the climate variation being experienced in the last few years	Interview Skills (May use **Wadhwani Co-Pilot** or similar platforms) Role play
10	**1, 3**	**6, 7**	**CLIMATE CHANGE – A CONVERSATION** Comprehension - Unknown Passage/Story	After going through the trailer of *Gandhada Gudi* available at https://www.youtube.com/watch?v=cScfvBT6LGU and write a summary of the same. This shall also include their experiences of such naturally beautiful places in their vicinity.	Non Verbal Communication – Body Language, Gesture, Posture, Image, Tone, Pitch, Voice Modulation, Eye Contact, Space
11	**1, 3**	**6, 7**	**A PAGE FROM THE DIARY OF A YOUNG GIRL**	Students will search for information about the books *War and Peace* and *Train to Pakistan* and based on that, will debate the pros and cons of international wars	Professional Correspondence – CV Covering letter, Letters to the editor, higher officers, letters of complaint, business letters
12			**A PAGE FROM THE DIARY OF A YOUNG GIRL**	Students will start maintaining a journal of daily activities. They will record events and	Email Writing Personal and Official Correspondence

	1, 2	**6, 7**	**Punctuation Comprehension - Unknown Passage**	happenings around them and note down their own opinions about the same	Journal Keeping, Note Taking, Notices, Circulars, Announcements, Notifications, Government Orders, Office Memos, Minutes of Meeting, Offer/Appointment & Termination/Resolution Letters, DO Letters, UO Notes
13	**1, 2, 3**	**6, 7**	**Seminars on the textual topics covered from Week 1 to 12**	A set of students shall present a chosen topic from the text and the rest shall interact with them in turns and vice versa	Preparation of a comprehensive report on the topics covered till date, with student inputs and feedback recorded in writing. Content, Style, Format and Syntax of Report Writing to be made aware to and followed by students

EXAMPLES OF TUTORIAL QUESTIONS/LEADS:

The students shall be asked to mull over and articulate their thoughts about the following. These questions must be broad based and analytical, suitable for developing a deeper understanding of the subject through research, group-discussion, opinion sharing, critical analysis and synthesis.

1. Describe the leadership style of a chosen figure. How have their leadership qualities contributed to their successes and failures? Include examples of how their management approach has evolved over time.
2. How has a chosen figure addressed ethical considerations within their businesses and innovations? Discuss any notable instances where their decisions have led to ethical debates.
3. How has a chosen figure's personal life and public persona influenced their professional image? Discuss how they have managed public relations and personal challenges.
4. To what extent do you think luck played a role in the success of a chosen figure? Assess the balance between luck, skill, and determination in their career.

4. References:

Daniel Jones. The Pronunciation of English. Cambridge: Cambridge University Press,1956. 2. James Hartman et al. Ed. English Pronouncing Dictionary. Cambridge: Cambridge University Press, 2006. 3. Rajesh Kumar et al. English Language Communication Skills: Lab Manual cum Workbook. Cengage: Cengage Learning India Pvt. Ltd, 2019. 4. Kandula Nirupa Rani et al. Speak Well. Orient BlackSwan: Orient BlackSwan Private Limited, 2012. J.D.O'Connor. Better English Pronunciation. Cambridge: Cambridge University Press, 1980. 5. ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities. Orient BlackSwan: Orient BlackSwan Private

5. Suggested Activities: *The Course coordinator shall facilitate the learning of various attributes and attainment of course outcomes through active involvement in and proper stimulation of students' learning processes. Lecture, Tutorial and Practice as well as all assessment activities shall be carried out in batches, inside a well-equipped Language Laboratory. A* ***word a day*** *concept should be introduced and students encouraged to bolster their vocabulary.* ***Grammar exercises may be referenced from*** **Advanced English Lessons, available at https://www.englishpage.com.**

The following is just an indicative and not a comprehensive set of activities for the course. Students and Faculty are encouraged to choose activities that are relevant to the topics being discussed and based on the availability of resources/availability of implementation at their institutes.

Speaking Skills

1. **Role-plays**: Create role-playing scenarios that simulate real-life situations students may encounter in their future careers. For example, role-play scenarios could include job interviews, client consultations, or group project meetings. This activity allows students to practise speaking in different contexts and develop their communication skills
2. **Mock Interviews**: Conduct mock job interviews or admission interviews where students take turns playing the role of interviewer and interviewee. Provide feedback on communication skills, professionalism, and interview performance, helping students improve their speaking skills in professional settings.
3. **Storytelling**. Students can briefly summarise a tale or story they have listened to.They may create their own stories to tell to the class.
4. **Debates**. Holding **debates** is a great way for students to speak a lot in class, as you only act as the facilitator or judge during the activity.
5. **Instructions and Directions**: The student is asked to give directions or instructions, for example to the school library.

Listening Skills

1. **Listen and Summarise**: Provide students with recordings of academic lectures or TED Talks relevant to their field of study. After listening, ask them to summarise the main points, key ideas, and arguments presented in the talk. This activity not only hones listening skills but also reinforces comprehension and critical thinking.

2. **Dictations -** Vocabulary, syntax based
3. **Interactive Listening Games/Activities**: Introduce interactive listening games or activities such as "listen and draw" (where students listen to instructions and draw what they hear) or "listen and sequence" (where students listen to a series of events and arrange them in order). These activities make listening practise enjoyable and reinforce comprehension skills.
4. **Pairings/Group Listening Activities**: Organise pair or group listening exercises where students listen to audio clips or short speeches together. Afterward, encourage them to discuss and share their interpretations, ensuring active engagement and collaboration.
5. **Telephone.** In this activity, students are responsible for listening carefully to their peers in order to successfully relay a message.

Browsing and Presentation Skills

1. Browse KPSC website for the post of Assistant Civil Engineer, extract the details and create 5-6 slides using MS Powerpoint.
2. Browse through scholarship databases and funding opportunities available for you, extract the details and create a presentation using MS Powerpoint.
3. Browse any online collaboration tools and platforms to work on group projects with your classmates, extract the details and create a presentation using any MS Tools.
4. Browse websites and blogs offering professional development resources such as resume tips, interview advice, and career guidance, extract the information and create a presentation using any MS Tools.
5. Browse websites and resources offering skill development exercises, quizzes, and challenges related to your diploma program, extract the information and create a presentation using any MS Tools.

Unit	Concepts	Laboratory Activity
1	Composition, Documentation Elucidation, Presentation and Research	Use of Microsoft Word/Google Docs/Microsoft Powerpoint/Google Slides/WordUp, Memrise, Quizlet, Visuwords, Anki similar open source tools, use of internet to access various news portals and e-papers and magazines and LinkedIn, Facebook, Reddit profiles
2	Listening, Speaking, Verbal and Nonverbal skills	LingQ, FluentU, Speechling, YouTube, Spotify, Elsa Speak, Speechify, Speechnotes, Mozilla DeepSpeech, Descript etc for training students to practice simple conversational exercises.
3	Note taking, Official Communiques and presentation	Notepad, Microsoft OneNote, GoogleKeep, EverNote, Noteful, Obsidian, Gemini AI, Meta AI and ChatGPT for synthesis of various official communiques through input of bare points and Microsoft Powerpoint/Google Slides/similar open source presentation tools for effectively presenting official communication documents
4	Tools and etiquettes of Online Communication, Cyber crime	Google Meet, Microsoft Teams, WhatsApp, Telegram, YouTube
5	Interview Preparations, Body language	Wadhwani CoPilot, ChatGPT, Doulingo, Replika, YouTube,
6	Professional communication and correspondence	Emails, covering letters and notes of introduction, blogs, vlogs, podcasts using offline and online tools

6. *Model* Rubrics for Assessment of Activity (Qualitative Assessment)/ Portfolio Evaluation CIE-5

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Score
		2	4	6	8	10	
1	**CONTENT/ ORGANISATION**	Does not collect any information relating to the topic	Collects very limited information	Collects some information	Collects much information	Collects a great deal of information	**8**
2	**DURATION/ PACE**	Does not keep up time	Not up to the mark	Adequate	Above Average	Extremely good	**6**
3	**PRESENTATION**	Poor presentation	Scope for improvement	Average presentation skills	Presentation effective	Excellent Presentation	**2**
4	**LANGUAGE/ DELIVERY**	Poor Language skills	Scope for improvement	Average Language skills	Effective	Excellent Language	**4**
5	**WORD CHOICE**	Limited Vocabulary	Generally correct words	Experiments with figurative language	Effective and creative verbs	Powerful and engaging words. Accurate and precise	**2**
	Average Marks= (8+6+2+4+2)/5=4.4						**5**

Note: **Descriptors can be redefined by course coordinators as per classroom requirements.**

7. CIE and SEE Assessment Methodologies

Sl. No	Assessment	Week	Duration	Max marks	
1.	**CIE-1 Theory Test**	4	90	50	Average of all 5 CIE=50 Marks Min Passing Marks: 40% in total (20/50)
2.	CIE-2 Practice Test	7	180	50	
3	**CIE-3 Theory Test**	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	**CIE-5 Portfolio Evaluation** *(Students are expected to submit a comprehensive report on at least 2 activities executed/performed during the 3rd and 8th weeks of the semester. The same shall be submitted to the course coordinator in the form of a bound folio, with proper indexing and certificate. A maximum of 50 marks shall be awarded for each activity. The final score shall be the average of the marks scored in the three activities)*	1-13	NA	50	
Total Continuous Internal Evaluation (CIE)					50 Marks
Semester End Examination (SEE) -Theory					**NA**
Semester End Examination (SEE)-Practice		180		50	50 Marks
Total Marks: CIE+SEE (50+50)					**100 Marks**

CIE Theory Test 1 (Test No. 1)

Program	Common to all Engineering and Non Engineering Programmes			Semester I/II	
Course Name	ESSENTIAL ENGLISH COMMUNICATION			Test	I/III
Course Code	25EG01I	Duration	90 min	Marks	50

Name of the Course Coordinator:

Note to Course coordinators: This test shall assess learnings from the topics and exercises covered during the first four weeks of the semester, i.e from the texts: THE INSPIRATIONAL STORY OF ELON MUSK & An excerpt from OORU KERI. This shall include Question-Answer and Composition exercises. Each question may have one, two or three subdivisions. Optional questions (1:1 choice) in each section carry the same weightage of marks, cognitive level and course outcomes.

Answer any one full question from each section. Each full question carries equal marks.

Q. No	Questions	CL	Course Outcome	Marks
1	a) List any five of Elon Musk's achievements. Provide details about any one of them. b) Based on your reading of the excerpt from OORU KERI, elaborate the statement: "Nature is an integral part of life in the villages". **OR** c) Briefly define the working of any two of the following: *Tesla Cybertruck/The Boring Company/Tesla Superchargers/Tesla AutoPilot/NeuraLink.* d) Is the writer angry or amused about the societal practices in his village? Explain with examples.	L1 L3 L1 L3	1	10X2=20
2	a) Write a paragraph of not more than 200 words about your favourite personality? **OR** b) What are the qualities of a good leader? Explain with the help of an example?	L2 L2	1	10
3	a) Describe how Coronavirus affected your family. **OR** b) Write a short note about your recent visit to a tourist destination.	L1 L1	1	10
5	a) Draft a fresher Resume to apply for a suitable job? **OR** b) Create a Profile suitable for use in LinkedIn?	L5 L5	1	10

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

CIE Theory Test 2 (Test No. 3)

Program	Common to all Engineering and Non Engineering Programmes			Semester I/II	
Course Name	ESSENTIAL ENGLISH COMMUNICATION			Test	I/III
Course Code	25EG01I	Duration	90 min	Marks	50
Name of the Course Coordinator:					

Answer any one full question from each section. Each full question carries equal marks.

Note to Course coordinators:

This test shall assess the learnings from the topics and exercises covered between weeks 5-10 of the semester, i.e from the texts: THE SECRET OF MACHINES, CYBERCRIME, CLIMATE CHANGE – A CONVERSATION and A PAGE FROM THE DIARY OF A YOUNG GIRL. This shall include Question- Answer, Concept Development, Comprehension and Grammar. Each question may have one, two or three subdivisions. Optional questions (1:1 choice) in each section carry the same weightage of marks, cognitive level and course outcomes.

Q. No	Questions	CL	CO	Marks
1	a) Though the poem *The Secret of Machines* refrains from naming them explicitly, it is understood that there are clear references to many machines. Name any five such and explain their functions in simple words. b) From the reading of the text and your experience of using the internet on computers and phones, list ten good practices that will help you stay away and safe from the threats of cybercrimes. **or** c) What events/circumstances inspired Ms. Kangujam to take up climate activism? d) Jacques's matter of fact statement "I don't dare do anything anymore, 'cause I'm afraid it's not allowed"is a testament to the life of Jews during the II World war. Justify in light of your reading of Anne Frank's diary.	L1 L4 L1 L4	1	10X2=20
2	a) Write a letter to the Deputy Commissioner of your district requesting him to arrange for regular supply of potable water in your locality. Highlight the difficulties being faced by the residents in light of severe summer heat. **OR** b) The annual day function of your college is slated to be held on a certain date this month. Imagine the necessary details and prepare a detailed notice to be displayed for public information.	L3 L3	1	10
3	a) Develop a narrative using the following hints: Lion - sleeping in a forest - mouse - playing on it - angry lion - threatened to kill the mouse - mouse asked to forgive - promised to save him one day - lion laughed - let him off - another day - lion caught by hunter - in net - mouse heard the lion roar - mouse cut the net with his teeth - lion escaped - thanked the mouse. **OR** b) A poor woodcutter's axe slipped and fell into a river—-a God heard him cry and wanted to help him—–he dived brought a gold axe for him——the honest woodcutter did not take this axe——the god again went down into the river and brought up a silver axe, woodcutter refused to accept——the god was very pleased and gave him his own axe as well as the gold and silver axes	L5 L5	1	20

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

9. CIE Practical Test 1 (Test No. 2)

Program	**Common to all Engineering and Non Engineering Programmes**			**Semester**	**I/II**
Course Name	ESSENTIAL ENGLISH COMMUNICATION			**Test**	**IV**
Course Code	**25EG01I**	**Duration**	**3 Hrs**	**Marks**	**50**
Name of the Course Coordinator:					

Questions	**Course Outcome**	**Marks**
Note to Course coordinators: The questions shall concentrate on assessing students' listening and speaking skills, based mainly on audiovisual inputs provided in the classroom from week 1-7. The coordinator may choose one of the videos listed in the curriculum or may even use other audio clips/videos, based on viability.		
Answer any one full question. 1a. Listen to the audio clip being played. Based on your understanding of the audio, answer the following questions. i. ii. iii. iv. v. **OR** **1b.** Sit with a friend of your choice. Talk to him/her and find out about his personal life, achievements, goals and aspirations. Prepare a short writeup of not more than 200 words about the same.	**2**	**50**
Scheme of Valuation **1a & 1b:** Ten marks for each question. Grammatical and syntactical mistakes shall be penalised. The idea is to assess the listening skills of the student and his/her ability to transform the gleaned information into coherent, purpose-built answers.		
	Total Marks	**50**

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

CIE Practical Test 2 (Test No. 4)

Program	Common to all Engineering and Non Engineering Programmes			Semester	I/II
Course Name	ESSENTIAL ENGLISH COMMUNICATION			Test	IV
Course Code	25EG01I	Duration	3 Hrs	Marks	50
Name of the Course Coordinator:					

	Course Outcome	Marks
Note to Course coordinators: The questions shall concentrate on assessing students' presentation skills using modern tools of communication, based on the topics covered in the class between week 8-13.		
Answer any one full question. Grammatical and syntactical mistakes shall be penalised. **1.** a) You are Raghavan. Prepare a **resume** using *relevant details* from the information given below. Use your imagination to fill in details that are not provided. The resume is for seeking an internship at Cognizant/MI India/KPTCL. b) Type the same Resume in MS Age: 18, Height: 5.2, SSLC: 88%, Face resembles Salman Khan, Hobbies: playing PUBG, National Level Tennis Player, Favourite dessert: Ice-cream, Body Builder, Disco dancer, School Leader in 10^{Th} Std, Working part time in father's office, Zodiac sign: Libra. **OR** 2. a) List any five technical terms related to your branch. Explain their meanings in simple words. b) Prepare a PPT highlighting the meaning and importance of the above words.	**3** **3**	**25+25** **25+25**
Scheme of Valuation **1a.** Five marks for including all the essential components of resume; five marks for using only the relevant details; five marks for building up and using the missing details; five marks for relevance of purpose; five marks for presentation **1b.** Ten marks for error free recreation of the written resume in MS Word. Fifteen marks for proper use of formatting and stylistic tools. **OR** **2a.** Five marks for including all the essential components of resume; five marks for using only the relevant details; five marks for building up and using the missing details; five marks for relevance of purpose; five marks for presentation **2b.** Ten marks for error free recreation of the written resume in MS Word. Fifteen marks for proper use of formatting and stylistic tools.		
	Total Marks	**50**

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

10. SEE - Model Practical Question Paper

<table>
<tr><td>Program</td><td colspan="2">Common to all Engineering and Non Engineering Programmes</td><td>Semester</td><td>II</td></tr>
<tr><td>Course Name</td><td>ESSENTIAL ENGLISH COMMUNICATION</td><td>Course Code: 25EG01I</td><td>Duration</td><td>3 Hrs</td></tr>
<tr><td colspan="3">Note to paper setters: 15 marks for written answers - BTE answer script; 15 marks for demonstration using computers; 10 marks for activity based assessment (class notes and assignments); 10 marks for viva-voce questions
Questions on Email Writing, Personal and Official Correspondence, Notices, Circulars, Announcements, Journal Keeping, Note Taking, Notifications, Government Orders, Office Memos, Minutes of Meeting, Offer/Appointment & Termination/Resolution Letters, DO Letters, UO Notes, ,CV Covering letter, Letters to the editor, higher officers, letters of complaint, business letters, interview skills, Technical/Professional Writing, Individual Profile Creation and Resume Preparation, Non Verbal Communication – Body Language, Gesture, Posture, Image, Tone, Pitch, Voice Modulation, Eye Contact, Space can be included in this section.</td><td colspan="2">50 marks</td></tr>
<tr><td colspan="3">1. Question based on audiovisual inputs (Listening and Speaking skills)
2. Question based on presentation skills using technological tools (using computers)
3. Question based on Portfolio Evaluation/Activities
4. Viva-voce questions based on listening and speaking skills.</td><td>3 hours</td><td>15
15
10
10</td></tr>
<tr><td colspan="4">Total Marks</td><td>50</td></tr>
</table>

1) Signature of Examiner 1 **2) Signature of Examiner 2**

11. Equipment/Software list with Specification for a batch of 30 students

Sl. No.	Particulars	Specification	Quantity
1	Desktop Computers (All in ones preferred)	Core i7 and above 16GB RAM 1TB ROM Windows 11+	31
2	Headphones with mic	Sony MDR ZX110AP Wired Headset with In-line remote and mic for hands-free calls	31
3	Multimedia Speakers	Sony SA-D40 4.1 Channel Speaker, 80 Watts	1 Set
4	Ink Tank Colour Printer	HP 790 Ink Tank Multifunction Colour Wi-Fi Printer	1
5	UPS	As per the power needs for the above setup (10KV)	1
6	Digital Projector Ceiling-mounted with brackets and installation	Epson EB695Wi	1
7	LAN/WiFi with High Speed Internet connection		31
8	Language Lab Modules/Softwares Robotel/ SPEARS Language Lab/ iTell Digi Language Lab/ Digital Teacher OR similar		
9	**Books for Reference** 1. Daniel Jones. The Pronunciation of English. Cambridge: Cambridge University Press,1956. 2. James Hartman et al. Ed. English Pronouncing Dictionary. Cambridge: Cambridge University Press, 2006. 3. Rajesh Kumar et al. English Language Communication Skills: Lab Manual cum Workbook. Cengage: Cengage Learning India Pvt. Ltd, 2019. 4. Kandula Nirupa Rani et al. Speak Well. Orient BlackSwan: Orient BlackSwan Private Limited, 2012. 5. J.D.O'Connor. Better English Pronunciation. Cambridge: Cambridge University Press, 1980. 6. ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities. Orient BlackSwan: Orient BlackSwan Private		

CO-PO CORRELATION

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7
1	0	0	0	0	0	3	3
2	0	0	0	0	0	3	3
3	0	0	0	0	0	3	3
LEVEL 3- Highly Mapped, LEVEL 2-Moderately Mapped, LEVEL 1- Low Mapped, Level 0- Not Mapped							

CO	UNIT	PO	CL	HOURS	MARKS
1	1, 2, 3, 4, 5, 6	6, 7	L1, L2, L3, L4 L5	36	35
2	2, 5	6, 7	L2, L3, L5	32	30
3	1, 3, 4, 6	6, 7	L1, L2, L3, L4 L5	36	35
TOTAL HOURS/MARKS				**104**	**100**

x x x

Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	Non Mechanical & Allied Programs	**Semester**	I/II
Course Name	Computer Aided Engineering Graphics (CAEG)	**Type of Course**	Integrated
Course Code	25ME02I	**Contact Hours**	7 Hrs/Week= 91Hrs
Teaching Scheme	L: T:P 3:0:4	**Credits**	5
CIE Marks	50	**SEE Marks**	50

1. **Rationale:** Engineering Drawing is universal & effective language of engineers that strengthens the technological structure. It helps in communicating design ideas and technical information to engineers and other professionals throughout the design process. The objective of Engineering drawing & CAD is to introduce the students, the techniques of drawing, visualize and represent 3D objects in 2D & create solid model.

2. **Course Outcomes :**At the end of the Course, the student will be able to:

CO-01	Create sketches with proper dimensions using drawing instruments.
CO-02	Develop and Interpret Principal Views of Points, Lines, Planes and Solids.
CO-03	Draw Orthographic views for the given pictorial Drawing.
CO-04	Create Solid model for the given pictorial Drawing in CAD.

3. **Course Content**

Note: Practice shall be done in A4 drawing book.

WEEK	CO	PO	Lecture (3 Hours per week)	Practical (CAD) (4 Hours per week)
1	1	1,4,7	**Fundamentals of Engineering Drawing:** • Introduction to Engineering Drawing - Need for Engineering Drawing, Instruments Used in Engineering Drawing • Layout of Drawing sheet, Title Block, Types of Lines and its Applications. • **Dimensioning:** Introduction to dimensioning, Need for dimensioning & Eelements of dimensioning.	• **Practice Dimensioning of common features:** Line, Radius, Diameter, Arc, Chord, Angles, Sphere, Chamfer, Hole, through hole, Counter bore & Counter Sink.

			• **System of dimensioning:** Aligned system & Uni-direction system. • **Methods of Dimensioning** Chain, Parallel, Combined & Progressive Dimensioning	• Practice Problem on- Aligned and Uni-direction system of dimensioning. * • Practice Problems on - Chain Dimensioning, Parallel Dimensioning, Combined Dimensioning, Progressive Dimensioning
2	2	1,4,7	• **Projection of Points:** Problems on projection of points (All four quadrants). • **Projection of Lines :**(only First angle projection) for following conditions o Line parallel to both HP & VP o Line parallel to HP & Perpendicular to VP o Line parallel to VP & Perpendicular to HP.	• Practice Problems on projection of points (All four quadrants).* • Practice Problems on Projections of Lines
3	2	1,4,7	**Projection of Planes:** • Problems on projection of Planes (Triangular, Square, Pentagonal & Hexagonal laminas) With conditions: o Base edge resting on HP o Corner resting on HP o Inclination only to HP • Problems on projection Circular lamina with Inclination only to HP.	Practice Problems on Projection of Planes.*
4	2	1,4,7	**Projection of Solids:** • Problems on projections of Solids (Triangular and Square prism & pyramid) with conditions: o Base edge resting on HP o Corner resting on HP o Base Inclination only to HP. • Problems on projections of Cone with base Inclination only to HP	Practice Problems on Projection of Solids**.***
5	2	1,4,7	• Problems on projections of Solids (Pentagonal, Hexagonal prism & pyramid) with conditions: o Base edge resting on HP o Corner resting on HP o Base Inclination only to HP. • Problems on projections of Cylinder with base Inclination only to HP	Practice Problems on Projection of Solids**.***

6	3,4	1,4,7	**Orthographic Projections & Solid Modelling:** Draw Orthographic Views for Pictorial drawings.	• **Familiarization of CAD** window Commands like New file, saving the file, opening an existing drawing file, Undo, Redo, move commands, Menu bar, Tool bar, Task bar & Ribbon bar. • **Practice CAD commands** like arc, circle, square, rectangle, chamfer, Trim, Inclined lines, Extend, Extend to Next, Shell, Fillet, Group, Array and Mirror commands
7	3,4	1,4,7	Draw Orthographic Views for Pictorial drawings.	Create Solid model for Pictorial drawings in CAD & Extract Views.*
8	3,4	1,4,7	Draw Orthographic Views for Pictorial drawings.	Create Solid model for Pictorial drawings in CAD & Extract Views.*
9	3,4	1,4,7	Draw Orthographic Views for Pictorial drawings.	Create Solid model for Pictorial drawings in CAD & Extract Views.*
10	3,4	1,4,7	Draw Orthographic Views for Pictorial drawings	Create Solid model for Pictorial drawings in CAD & Extract Views.*
11	3,4	1,4,7	Draw Orthographic Views for Pictorial drawings.	Create Solid model for Pictorial drawings in CAD & Extract Views.*
12	3,4	1,4,7	Draw Orthographic Views for Pictorial drawings.	Create Solid model for Pictorial drawings in CAD & Extract Views.*
13	3,4	1,4,7	Draw Orthographic Views for Pictorial drawings.	Create Solid model for Pictorial drawings in CAD & Extract Views.*

Note: * Refer Annexure for suggestive practice questions and portfolio evaluation

4. References

Sl. No	Author	Title of Book	Publication/Year
01	Basant Agrawal/C N Agrawal	Engineering Drawing	3rd Edition, McGraw-Hill, 2019
02	K Venkata Reddy	Textbook of Engineering Drawing	2nd Edition, B S Publication
03	Venugopal K	Engineering Drawing and Graphics with Auto CAD	2009
04	N D Bhatt	Engineering Drawing	Charotar Publication

05	Imtiaz Hashmi	Fundamentals of Engineering Drawing	Lambert Academic Publishing,2010
06	M B Shah	Engineering Drawing	Pearson Education India, 2013
07	Frederick E Giesecke and Ivan L Hill	Technical Drawing with Engineering Graphics	Pearson Education Limited, 2013
08	K R Gopala Krishna	Engineering Graphics	Subhash Publications
09	R K Dhawan	Text book of Engineering Drawing	S Chand Publications
10	Maurice Arthur Parker	Engineering Drawing with Worked Examples, Volume 1	Stanley Thornes Publications

5. CIE Assessment Methodologies

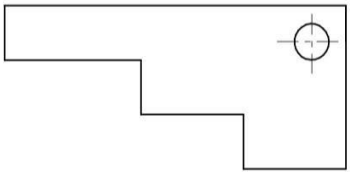
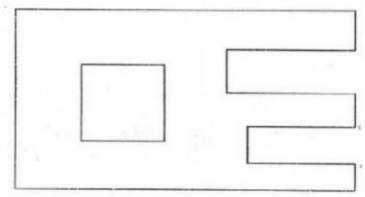
Sl.No	CIE Assessment	Test Week	Duration (minutes)	Max Marks	
1.	CIE-1 Practice Test	4	90	50	**Average of all CIE=50 Marks**
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3 Practice Test	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of A4 - Drawing book and activities through Rubrics	1-13	-	50	
Total					**50 Marks**

6. SEE – Practice Assessment Methodologies

Sl. No	SEE – Practice Assessment	Duration (minutes)	Max Marks	Min Marks to pass
1.	Semester End Examination-Practice	180	50	20

7. CIE Theory Test model question paper

Program	CS/EC/EE/IT/MT			**Semester I/II**	
Course Name	Computer Aided Engineering Graphics (CAEG)			**Test**	I
Course Code	25ME02I	**Duration**	90min	**Marks**	50
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					
Q. No	**Questions**		**Cognitive Level**	**Course Outcome**	**Marks**
Section-1					

1	a) Dimension the given sketch using aligned system with chain method.  b) Draw three principal views of a point **P,** 30mm Above HP, 50mm infront of VP & 40mm from Left Profile Plane.	Apply	C01	10+15=25
2	a) Dimension the given sketch using unidirectional system with parallel method.  b) Draw three principal views of a point P, 30mm Below HP, 50mm behind VP & 40mm from Left Profile Plane.			
	Section-2			
3	a) Draw the three principal views of a line 40 mm long when it is placed parallel to both HP & VP. The line is 30 mm above HP,40 mm in front of VP and 30mm from right Profile plane. b) A triangular lamina of base edge 40mm rests with one its base edge on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.	Apply	CO2	10+15= 25
4	a) Draw the three principal views of a line 40mm long which it is inclined at 30°to VP and parallel to HP. The line is 30mm above HP, 40mm in front of VP and 30mm from right profile plane. b) A pentagonal lamina of base edge 40mm rests with one its base edge on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.			
Note for the Course coordinator: Each question may have one, two or three sub divisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.				

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

8. CIE Practice Test model question paper

Program	CS/EC/EE/IT/MT			**Semester**	I/II
Course Name	Computer Aided Engineering Drawing.			**Test**	II/IV
Course Code	25ME02I	**Duration**	180 min	**Marks**	50
Name of the Course Coordinator:					

Questions	**CO**	**Marks**
a) A pentagonal Prism of base edge 40mm and height 60mm rests with one its corner on HP so that the base of the prism is inclined at 30° to HP. Draw the	CO2	20

projections of the prism. (ANSWER SHEET) b) Draw Orthographic views for a pictorial Drawing (ANSWER SHEET) & create solid model of the same pictorial drawing Extracting Views (CAD)	CO3, CO4	30
Scheme of assessment for Q1 1. Drawing projections of a Solid - 15 Marks 2. Adopting Dimensioning & Drawing convention (types of lines) -5Marks	**Scheme of assessment for Q2** 1. Drawing orthographic Views in answer sheet-15 Marks 2. Creating solid model in CAD -10Marks 3. Extracting Views- 5 Marks	
	Total Marks	**50**

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

9. Suggestive Activities for Tutorials:

- The students shall do minimum of one suggested activities
- List is an Example and not inclusive of all possible activities of the course.
- Student and Faculty are encouraged to choose activities that are relevant to the topic.

Sl. No.	Suggestive Activities for Tutorials
01	Prepare Nut and Bolt by 3D Printing
02	Prepare V block/ Patterns by 3D Printing
03	Prepare solid models of Inter-disciplinary components by 3D Printing

10. Rubrics for Assessment of A4 -Drawing sheet and Activities (Qualitative Assessment)

Sl. No.	Dimension	Unsatisfactory	Need Improvement	Satisfactory	Good	Excellent	Students Score
		(0-10)	(11-20)	(21-30)	(31-40)	(41-50)	
1	Technical Accuracy	Significant errors make the drawing unusable.	Multiple inaccuracies	Some errors affecting understanding but correctable.	Minor errors in interpretation or calculations	All details are accurate	40
2	Line Quality	Lines are messy and confusing.	Lines are uneven	Inconsistent line quality	Clear lines with minor inconsistencies.	Clean and consistent lines	40
3	Dimension	Dimensions are missing or incorrect.	Many errors; hard to interpret	Some dimension errors affecting interpretatio	Mostly accurate; minor issues	Dimensions are precise, clear, and correctly positioned, following	45

				n.		standards.	
4	Presentation & Neatness	Very untidy; Very poor presentation	Messy;Presentation hinders clarity	Somewhat neat;Some layout issues	Generally neat with minimal flaws; minor improvement in Presentation	Extremely neat and organized; all details easy to read	40
5	Adherence to Standards	Does not follow any drawing standards.	Limited adherence to standards	Lacks consistency.	Minor deviations from standards.	Aadheres to relevant drawing standards (ISO, ANSI, etc.).	35
	Average Marks = (40+40+45+40+35)/5 = 40 Marks						**40**

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

11. SEE- Model Practice Question Paper

Program	CS/EC/EE/IT/MT		**Semester**	I
Course Name	Computer Aided Engineering Graphics (CAEG)	**Course Code:** 20ME02I	**Duration**	180 min
			Max Marks	50
Questions			**CO**	**Marks**
1. Draw Orthographic views for a pictorial Drawing (ANSWER SHEET) & create solid model of the same pictorial drawing (CAD)			3,4	50
Scheme of assessment for Q1 • Drawing orthographic Views in answer sheet -15 Marks • Creating solid model in CAD – 25 Marks • Extract Views – 5 Marks • Printout - 5 Marks				
			Total Marks	**50**

1) Signature of the Examiner **2) Signature of the Examiner**

12. Equipment/software list with Specification for a batch of 30 students

Sl. No.	Particulars	Specification	Quantity
01	Drawing tables	As per standard size	30
02	CAD software	-	30 users
03	Computers	Latest configuration	30

***Annexure**

Students shall practice these or similar questions for portfolio evaluation

1. Fundamentals of Engineering Drawing

Drawing Sheet No. 1 – (Student has to submit Minimum one standard size drawing sheets (A2) in this unit for portfolio evaluation).

- DrawFig.1&Fig.2as per the drawing and identify types of lines.

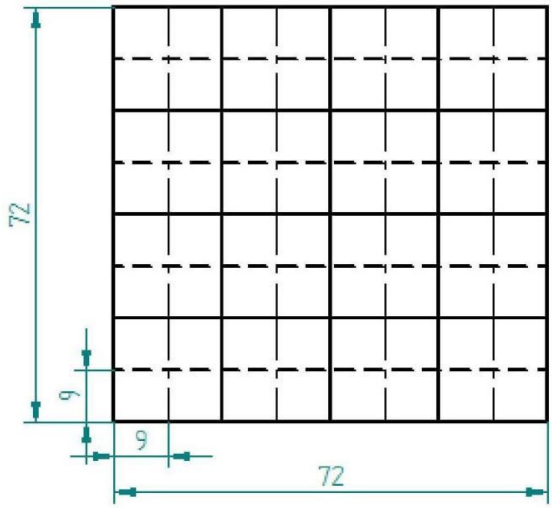


Fig.1

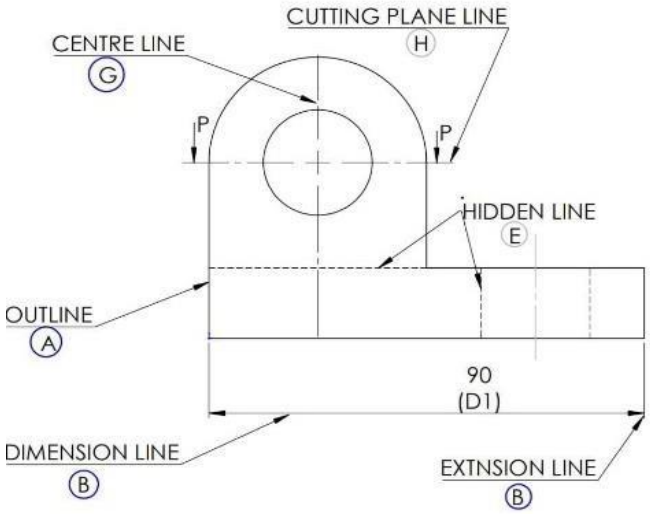


Fig.2

2. Dimensioning

Drawing Sheet No.2 & 3 - (Student has to submit Minimum two standard size drawing sheets (A2) in this unit for portfolio evaluation)

Draw Fig.3 to 1:1scale,1:2 scale & 2:1scale.

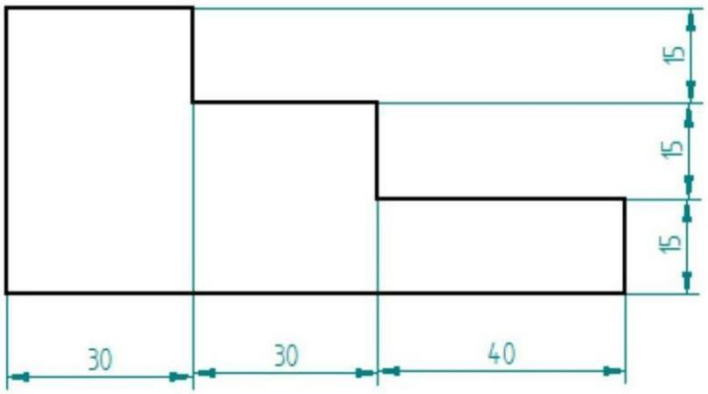


Fig.3

- Copy Fig. 3 to 1:1 scale and dimension it using both Aligned system & Uni-directional system.
- CopyFig.4to2:1ScaleanddimensionitusingAlignedsystemwithChaindimensioning.

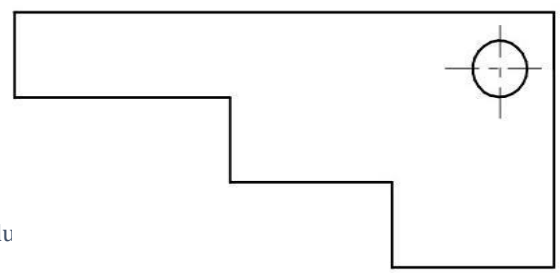


Fig.4

- Copy Fig. 5 to 1:1 Scale and dimension it using Unidirectional system with Parallel dimensioning

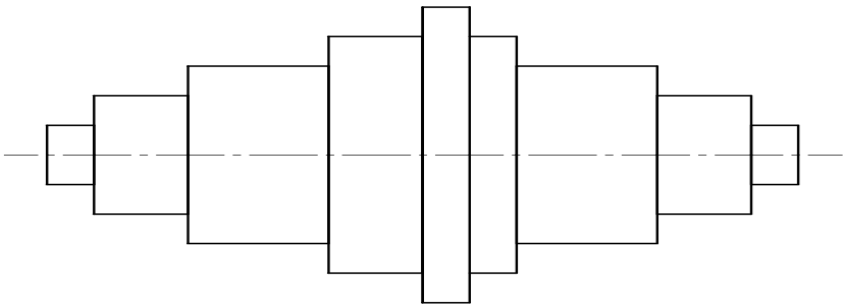


Fig.5

- Copy Fig. 6 to 1:1 scale and dimension it using unidirectional system with Combined dimensioning method

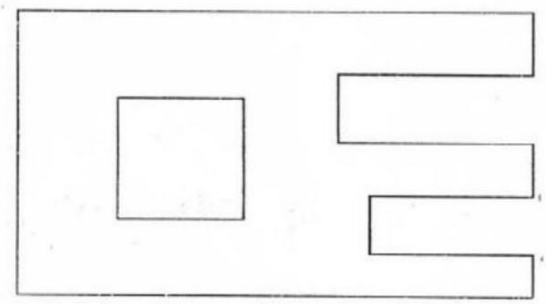


Fig.6

- Copy Fig. 7 to 1:1 scale and dimension it using Aligned system with Progressive dimensioning method

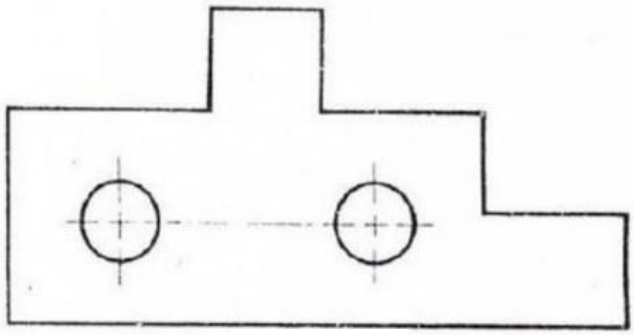
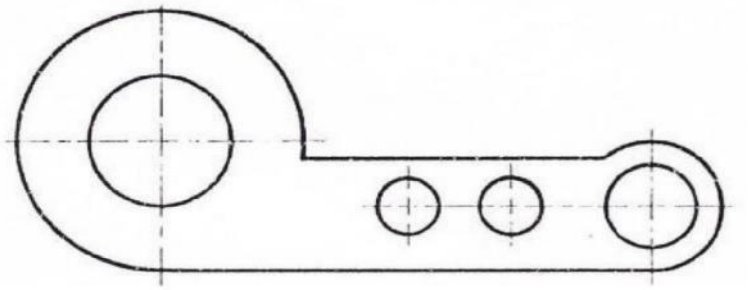


Fig.7

- Copy Fig. 8 to 1:1 scale and dimension it using Aligned system with chain dimensioning method



- **Fig.8**

2. Projection of Points

Drawing Sheet No.4- (Student has to submit Minimum one standard size drawing sheet (A2) in this unit for

portfolio evaluation).

Q1. Draw three principal views of a point P, 30mm Above HP, 50mm in front of VP&40mm from Left Profile Plane.

Q2. Draw three principal views of a point P, 30mm Above HP, 50mm behind VP & 40mm from Left Profile Plane.

Q3. Draw three principal views of a point P, 30mm Below HP, 50mm behind VP & 40mm from Left Profile Plane.

Q4. Draw three principal views of a point P, 30mm Below HP, 50mm in front VP & 40mm from Left Profile Plane.

2. Projection of Lines

Drawing Sheet No.5- (Student has to submit Minimum one standard size drawing sheet in this unit for portfolio evaluation).

Q1. Draw the three principal views of a line 40 mm long when it is placed parallel to both HP & VP. The line is 30 mm above HP, 40 mm in front of VP and 30mm from right Profile plane.

Q2. Draw the three principal views of a line 40 mm long when it is placed parallel to HP and perpendicular to VP. The line is 30mm above HP, 40mm in front of VP and 30mm from right Profile plane.

Q3. Draw the three principal views of a line 40 mm long when it is placed parallel to VP and perpendicular to HP. The line is 30mm above HP, 40mm in front of VP and 30mm from right Profile plane.

Q4. Draw the three principal views of a line 40mm long which it is inclined at 30° to HP and parallel to VP. The line is 30mm above HP,40mm in front of VP and 30mm from right profile plane.

Q5. Draw the three principal views of a line 40mm long which it is inclined at 30° to VP and parallel to HP. The line is 30mm above HP,40mm in front of VP and 30mm from right profile plane.

3. Projections of Planes

Drawing Sheet No.6 - (Student has to submit Minimum one standard size drawing sheet (A2) in this unit for portfolio evaluation).

Q1. A triangular lamina of base edge 40mm rests with one its base edge on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q2. A triangular lamina of base edge 40mm rests with one its Corner on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q3. A square lamina of base edge 40mm rests with one its base edge on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q4. A square lamina of base edge 40mm rests with one its corner on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q5. A pentagonal lamina of base edge 40mm rests with one its base edge on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q6. A pentagonal lamina of base edge 40mm rests with one its corner on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q7. A hexagonal lamina of base edge 40mm rests with one its base edge on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q8. A hexagonal lamina of base edge 40mm rests with one its corner on HP so that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

Q9. A circular lamina of 30mm diameter rests on HP such that the surface of the lamina is inclined at 30° to HP. Draw the projections of the lamina.

4. Projections of Solids

Drawing Sheet No.7- (Student has to submit Minimum one standard size drawing sheet (A2) in this unit for portfolio evaluation).

Q1. A triangular Prism of base edge40mm and height 60mm rests with one its base edge on HP so that the base of the prism is inclined at 30° to HP. Draw the projections of the prism.

Q2. A square Prism of base edge 40mm and height 60mm rests with one its base edge on HP so that the axis of the prism is inclined at 30° to HP. Draw the projections of the prism.

Q3. A pentagonal Prism of base edge 40mm and height 60mm rests with one its corner on HP so that the base of

the prism is inclined at 30° to HP. Draw the projections of the prism.

Q4. A hexagonal Prism of base edge 40mm and height 60mm rests with one its corner on HP so that the base of the prism is inclined at 30° to HP. Draw the projections of the prism.

Q5. Atriangularpyramidofbaseedge40mmandheight60mmisrestingwithoneofitscorneron HP so that axis of the pyramid is inclined at 30°to HP. Draw the projections of the pyramid.

Q6. AsquarepyramidofbaseedgeHP so that base of the pyramid is inclined at 30°to HP. Draw the projections of the pyramid.

Q7. A pentagonal pyramid of base edge 40mm and height 60mm is resting with one of its base edge on HP so that base of the pyramid is inclined at30°toHP.Drawtheprojectionsof the pyramid.

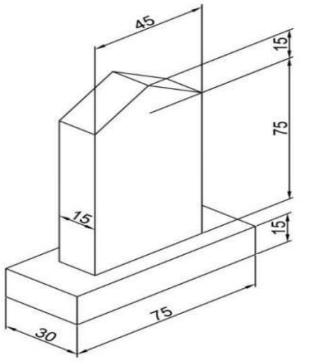
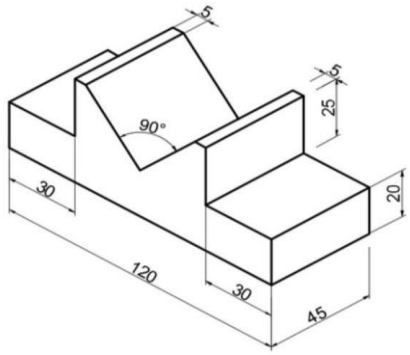
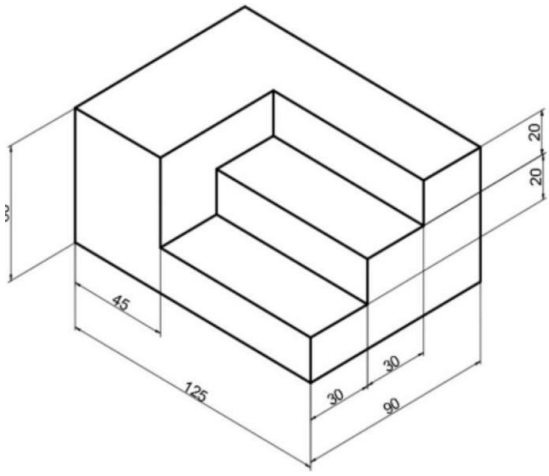
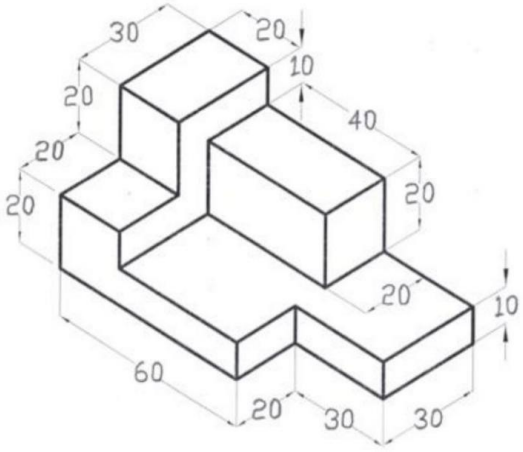
Q8. Ahexagonalpyramidofbaseedge40mmandheight60mmisrestingwithoneofitsbaseedge on HP so that base of the pyramid is inclined at30°toHP.Drawtheprojectionsof the pyramid.

Q9. A cylinder of 40mm diameter and axis height 65mm rests with its base on HP so that the base diameter inclined at 45° to the HP Draw the projections.

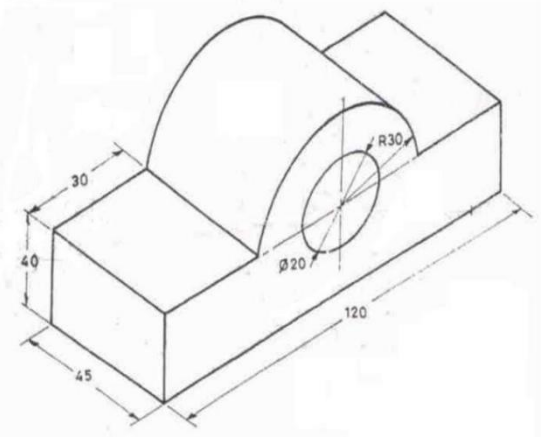
Q10. A cone of 40mm diameter and axis height 65mm is resting with its base on HP. Draw the projections if base diameter is inclined at 45° to HP.

5. Pictorial Drawings.

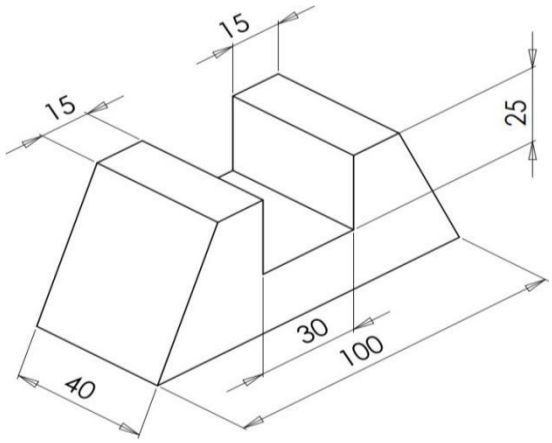
Drawing Sheet No.8,9& 10 - (Student has to submit Minimum two standard size drawing sheets(A2) in this unit for portfolio evaluation).

Q1. Draw the three principal views of the given component. & Create Solid Model. 	**Q2**. Draw the three principal views of the given component. & Create Solid Model. 
3. Draw the three principal views of the given component. & Create Solid Model. 	**4**. Draw the three principal views of the given component. & Create Solid Model. 

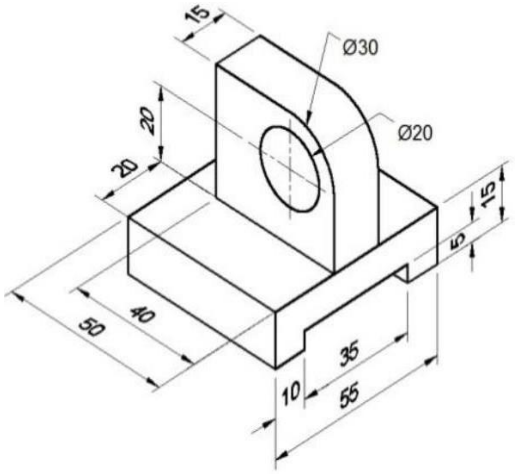
Q5. Draw the three principal views of the given component. & Create Solid Model.



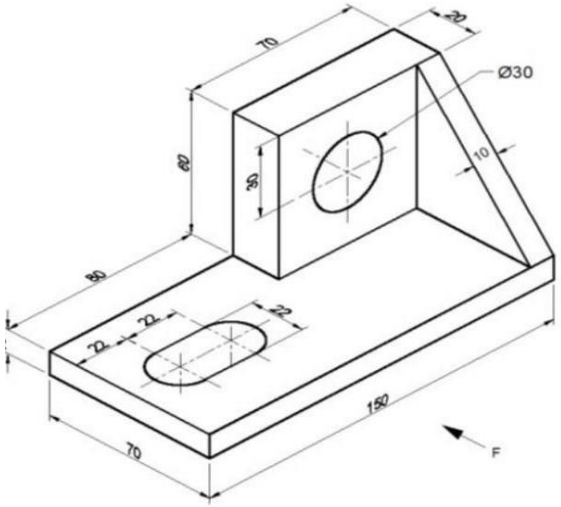
Q6 Draw the three principal views of the given component. & Create Solid Model.



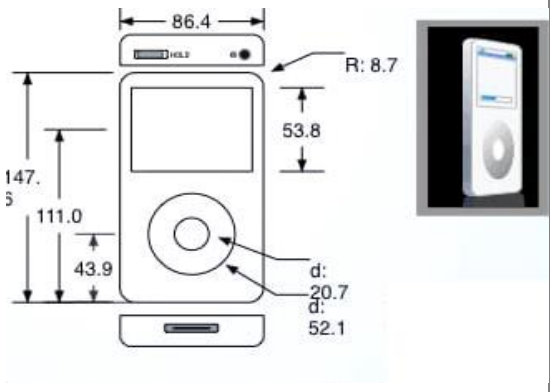
7. Draw the three principal views of the given component. & Create Solid Model.



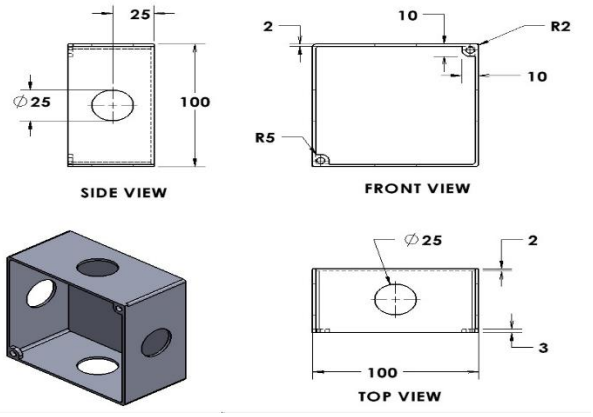
8 Draw the three principal views of the given component. & Create Solid Model.



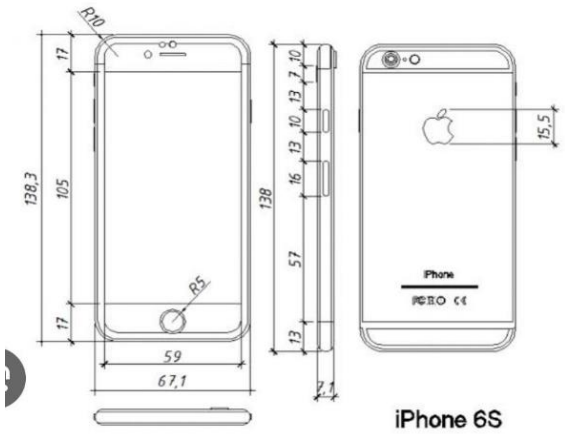
9 Create 3D model using CAD for the component whose orthographic views are given below



10 Create 3D model using CAD for the component whose orthographic views are given below



11 Create 3D model using CAD for the component whose orthographic views are given below



Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	Electronics & Communication	**Semester**	**II**
Course Name	**Applied Electronics-I**	**Type of Course**	Integrated
Course Code	**25EC21I**	**Contact Hours**	8 hours/week 104 hours/semester
Teaching Scheme	L:T:P :: 4:0:4	**Credits**	6
CIE Marks	50	**SEE Marks**	**50 (Theory)**

1. Rationale:

Applied electronics focuses on providing students with practical knowledge and hands-on skills that are directly applicable in the real-world electronic industry. It aims to equip students with the essential technical expertise needed to work as professionals in a variety of sectors that rely on electronic systems. Practical, focused and accessible topics for students to gain relevant skills that meet the needs of rapidly evolving industries.

By focusing on hands-on training, industry-relevant skills and emerging technologies, applied electronics programs ensure that students are ready to contribute to the workforce and tackle real-world challenges effectively. This education plays a crucial role in preparing the next generation of electronics professionals who will drive innovation and technological progress across a range of sectors.

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

CO-01	Apply the knowledge of semiconductors to illustrate the functioning of basic electronic devices.
CO-02	Identify and select the electronic components, devices & instruments for any specific application.
CO-03	Demonstrate the switching and amplification application of the semiconductor devices.
CO-04	Design simple applications under real environments.
CO-05	Test the designed circuit for an expected result/outcome, identify the problem and troubleshoot to obtain the desired result/outcome.

3. Course Content

WEEK	CO	PO	Theory	Practice
1	1,2	1,2,4,5	1. Introduction to basic Electronics: Definition: Electronics. 2. Atomic Structure, Structure of Elements, The Electron. 3. Energy of an Electron, Valence Electrons, Free Electrons. 4. Find the valence electrons of at least 6 given elements	1. Video demonstration on atomic structure. 2. Identification of Active and Passive components, Decade boxes (L, C and R).
2	1,2	1,2,4,5	1. Bohr's Atomic Model, Energy Levels, Energy Bands. 2. Energy Bands in Solids. 3. Classification of Solids and Energy Bands. 4. Atomic structure of Silicon & Germanium.	1. Tabulate the electron configuration of Tetravalent (Silicon, Germanium), Trivalent, Pentavalent. 2. Measurement of amplitude and frequency of sine, triangular, square waveform on CRO using signal generator.
3	1,2	1,2,4,5	1. Applied Electronics - Introduction, simple examples. 2. Bridge rectifier with Capacitive filter. 3. Ripple factor and efficiency for the above rectifier - Simple problems. 4. Soldering - introduction, soldering techniques, types, steps for soldering.	1. Practice Soldering Techniques. 2. Diode as Center tapped Full wave rectifier with Capacitive filter. Determine Vp, Vp-p, Time & Frequency of input signal using CRO. Measure Vrms and Vdc using multimeter and calculate Ripple factor and Efficiency of output signal.

4	1,2,4	1,2,4,5	1. Zener Diode - Construction, Symbol, working principle. 2. Applications - Zener diode as a voltage regulator. 3. LED - Construction, Symbol, working principle, applications. 4. Photo Diode - Construction, Symbol, working principle, applications.	1.Construct & verify Zener diode as voltage regulator, line regulation and load regulation. 2. Construct & verify forward & reverse bias characteristics of LED. Observe its light intensity for different voltages.
5	2,4	1,3,4,5	1. BJT - Current operating device. 2. BJT Types- PNP and NPN, Biasing of BJT. 3. Types of configurations - CE, CC, CB. 4. Need of DC load line, operating point.	1. Demonstrate Numbering System of Semiconductor Devices. Demonstrate different packages of Transistors. 2. Data sheet interpretation of any NPN & PNP transistors.

6	2,4	1,3,4,5	1. Stabilization, thermal runaway, heat sink 2. Voltage divider bias. 3. Definition of alpha, beta and gamma and relationship between them. 4. Input and output characteristics of CE.	1. Test the Transistor and determine the Input characteristics in CE configuration. 2. Test the Transistor and determine the output characteristics in CE configuration.
7	3,4	1,3,4,5	1. Applications of BJT - List the applications of transistors as switch in the real world. 2. Transistor as a Switch – working. 3. List the applications of Transistors as amplification in the real world. 4. Classification of Amplifiers based on usage, frequency capabilities, coupling methods and mode of operation.	1. Turn ON and OFF a BUZZER using a transistor. 2. Transistor as a Switch for electromagnetic Relay.

8	3,4	1,3,4,5	1. Single stage amplifier - Circuit diagram, working, various currents (I_b, I_c, I_e). 2. Voltage gain of CE amplifier (No derivation). 3. Frequency response of CE amplifier. 4. Simple problems on gain.	1. Do It Yourself (DIY) a Single Stage Amplifier. 2. Plot the frequency response of the CE amplifier.

9	3,4, 5	1,3,4,5, 7	1. Concept of Multistage amplifier. 2. Gain of the multistage amplifier. 3. Direct coupled amplifier - Circuit diagram, operation 4. Direct coupled amplifier - frequency response.	1. Build and test the performance of the Direct coupled two stage amplifier and Plot the frequency response. 2. DIY - Make an earphone for Mobile.
10	2,4, 5	1,3,4,5, 7	1. RC coupled amplifier – Circuit diagram, operation and frequency response. 2. Advantages, Disadvantages of RC coupled amplifier. 3. Applications of RC coupled amplifiers. 4. Comparison of Different Types of Coupling.	1. Build and test the performance of the RC coupled two stage amplifier and Plot the frequency response.
11	2,4, 5	1,3,4,5, 7	1. Voltage operating device - FET – Introduction of FET, Types of FET. 2. JFET - Symbol, Salient features of JFET. 3. Principle and working of JFET (N channel) 4. Importance of JFET, Difference between JFET and BJT.	1. Drain Characteristics of N-channel JFET. 2. Transfer Characteristics of N- channel JFET.

12	2,4, 5	1,3,4,5, 7	1. JFET parameters: Drain resistance (r_d), Transconductance (g_{fs}), Amplification Factor(μ) and relation among JFET parameters (No Derivation), JFET applications 2. MOSFET - Types, Symbol. 3. Construction, working principle and characteristics of Depletion MOSFET. 4. Construction, working principle and characteristics of Enhancement MOSFET.	1. Precautions to be followed for handling MOSFETs. 2. Demonstrate MOSFET as a switch to control an LED. 3. Demonstrate MOSFET as a switch to control a DC motor.

13	2,4, 5	1,3,4,5, 7	1. D-MOSFETs versus JFETs 2. D-MOSFETs versus E-MOSFETs 3. Introduction to CMOS, features, working and applications. 4. CMOS inverter: Schematic diagram, working and application.	1. Construct AND/OR gate using any transistors. 2. Construct NAND/NOR gate using any transistors.

Note:

1. In practice sessions all video demonstrations should be followed by MCQ/Quiz/ Subjective questions and evaluation has to be documented.

2. Online course completion certification to be done on relevant topics on Swayam/NPTEL/Infosys Springboard platforms or any other platform.

3. Problem statement to be collected from the relevant industries, resolve and submit it to the course coordinator.

4. References:

1. Principles of Electronics, Rohit Mehta & V K Mehta, S. Chand Publishing ISBN: 9788121924504
2. Fundamentals of Electrical and Electronics Engineering, B. L. Theraja, S. Chand and Company. REPRINT 2013, ISBN 8121926602
3. "A Textbook of Applied Electronics" by R. S. SEDHA.

4. Electronic Components, Dr. K. Padmanabhan and P. Swaminathan, Lakshmi Publications, 2006.
5. Electronic Devices and Circuits, David A. Bell, Oxford University Press, ISBN: 9780195693409.
6. https://youtube.com/shorts/YpXy5gGRncY?feature=shared
7. https://youtu.be/enwdrtef7r0?feature=shared
8. https://youtu.be/QmFo9KBlun0?feature=shared
9. https://youtu.be/sGxGQW9Ir0g?feature=shared
10. https://youtu.be/lFdtH9CHlfA?feature=shared
11. https://youtube.com/shorts/hUW_o0u5X6c?feature=shared
12. https://youtube.com/shorts/P94GHR8ohJk?feature=shared

5. CIE Assessment Methodologies

Sl.No	CIE Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1 Theory Test	4	90	50	Average of all CIE=50 Marks
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3 Theory Test	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
				Total	**50 Marks**

Note:- Portfolio evaluation includes average of (a) and (b)

(a) Any one of the Suggested activity model with report and presentation evaluated for 50 marks

(c) Each laboratory exercise will be evaluated for a total of 50 marks. The evaluation will include the following components:

1. Written description of the experiment in the observation book.
2. Conducting the experiment and the associated learning outcomes.
3. The results obtained from the experiment.
4. Corrections and evaluations of the experiment completed in the previous class, documented in the record book.

6. SEE - Theory Assessment Methodologies

Sl. No	SEE – Theory Assessment	Duration	Exam Paper Max marks	Exam Paper Max Marks scale down to (Conversion)	Min marks to pass
1.	Semester End Examination-Theory	3 Hours	100	50	20

7. CIE Theory Test model question paper

Program	**Electronics & Communication Engg**			**Semester - II**	
Course Name	**Applied Electronics - I**			**Test**	**I/III**
Course Code	**25EC21I**	**Duration**	**90 min**	**Marks**	**50**
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					

Q.No	**Questions**	**Cognitive Level**	**Course Outcome**	**Marks**
	Section - 1			
1	a) Realize a multistage amplifier using individual amplifiers. b) Identify and explain a two terminal electronic device which works as voltage regulator. c) Demonstrate transistors as an amplifier and list its applications.	L3 L3 L2	CO 1	5 M 10 M 10 M
2	a) Interpret JFET as a voltage controlled device. b) Explain the concept of field effect transistor and analyze how it controls current in JFET. c) Identify the types of JFET and explain the working of N Channel JFET.	L2 L3 L3	CO 1	5 M 10 M 10 M
	Section - 2			
3	a) Base width of the transistor is thin and the collector is thick. Infer your answer. b) Discuss the importance of heat sinks in transistors. c) Illustrate the working of NPN/PNP transistor	L2 L3 L2	CO 2	5 M 10 M 10 M
4	a) Develop an Inverter using CMOS. b) Explain working of enhancement type MOSFET and list its applications. c) Illustrate the transistor as a switch.	L3 L2 L2	CO 2	5 M 10 M 10 M

Note for the Course coordinator:

1. Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.
2. All questions must be framed under Understand (L2) & Apply (L3) cognitive level using Revised Bloom's Taxonomy.

Signature of the Course Coordinator | **Signature of the HOD** | **Signature of the IQAC Chairman**

8. CIE Practice Test model question paper

Program	**Electronics & Communication**			**Semester**	**II**
Course Name	**Applied Electronics - I**			**Test**	**II/IV**
Course Code	**25EC21I**	**Duration**	**180 min**	**Marks**	**50**
Name of the Course Coordinator:					

Questions	**CO**	**Marks**
Write up for two experiments and conduction of any one experiment.	CO 4,CO 5	**50**
Scheme of assessment **a) Writing the Circuit diagram, tabular column, calculations etc. for two experiments.** **b) Rig up and Conduction of any one** **c) Troubleshooting** **d) Result/Output** **e) Viva-voce**		**20 M** **10 M** **05 M** **05 M** **10 M**
Total Marks		**50**

Signature of the Course Coordinator | **Signature of the HOD** | **Signature of the IQAC Chairman**

9. **Suggestive Activities**:

The List is an example and not inclusive of all possible activities of the course. Students and Faculty are encouraged to choose activities that are relevant to the topic.

Note: Activity can be undertaken by either an individual or a team comprising up to 5 students.

Sl.No.	**Suggestive Activities**
01	Smoke detector application
02	Fire Alarm/detector application.
03	Clapp/sound detector application
04	Intruder detector
05	LED serial-sets
06	Simple 10 Watt Audio Amplifier
07	And all such simple circuits/projects that have scope to integrate multiple concepts learnt and for which circuits/boards/components are easily available.

10. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		10	20	30	40	50	
1		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	40
2		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	30
3		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	50
4		Descriptor	Descriptor	Descriptor	Descriptor	Descriptor	20
	Average Marks=(40+30+50+20)/4=35						**35**

Note: Dimension and Descriptor shall be defined by the respective course coordinator as per the activities

11. Equipment/software list with Specification for a batch of 30 students

Sl. No.	Particulars	Specification	Quantity
1	Regulated Power Supply (Single) with short-circuit protection	1A/2A 0-30V	15
2	Regulated Power Supply (Dual) with short-circuit protection	1A/2A 0-30V	15
3	Function Generator	0-10MHz	15
4	Dual Trace Oscilloscope	20MHz	15
5	Digital multimeters.		20
6	Decade resistance boxes		15
7	Decade capacitance boxes		15
8	Decade inductance boxes		15
9	LCR meter		05
10	Electronic components/Consumables resistors, inductors, capacitors, transformers, hook up wires, SCR, MOSFET, DIAC, TRIAC, BJT, JFET, diode, Zener diode, soldering lead Etc.		20 each
11	Bread boards, Soldering Gun, Tag Board, General purpose PCB, 9V battery cells, Bulbs.		20 each

Government of Karnataka
Department of Technical Education

Programme	All Diploma Programmes (Audit Course)	**Semester**	II
Course Code	Programme Specific	**Type of Course**	Audit
Course Name	**Indian Constitution**	**Contact Hours**	2 hours/week 26 hours/semester
Teaching Scheme	L:T:P :: 2:0:0	**Credits**	2
CIE Marks	50	**SEE Marks**	-

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

CO-01	**CO1**	Understand Preamble, salient features and importance of Indian Constitution.
CO-02	**CO2**	Understand Fundamental rights, duties and Directive principles of state policy.
CO-03	**CO3**	Understand Parliamentary system of governance, Structure, Functions, Power of Central, state governments (Legislative, Executive) and Judiciary.
CO-04	**CO4**	Understand Panchayat Raj Institutions and Local self-governments, UPSC, KPSC, NHRC, Status of women, RTE etc.

2. Course Content

Week	CO	Detailed Course Content	Contact Hours
1	1	Introduction to constitution of India-Formation and Composition of the Constituent Assembly-Salient features of the Constitution-Preamble to the Indian Constitution	2
2	1,2	Fundamental Rights- Definition, The right to equality, The right to freedom, The right against exploitation, The right to freedom of religion.	2
3	1,2	Cultural and educational rights and The right to constitutional remedies. Fundamental Duties, Directive principles of state policy.	2
4	1,3	Parliamentary system of governance- Structure of Parliament- Lok Sabha and Rajya Sabha. Functions of parliament- Legislative, Executive, Financial Function Powers of Lok Sabha and Rajya Sabha.	2
5	1,3	Procedure followed in parliament in making law, Annual financial statement (Budget) – procedure in parliament with respect to estimates, Appropriation bill, Supplementary, additional grants, Vote on account, votes on credit and exception grant, special provisions, rules of procedure.	2
6	1,3	Structure of union executive, Power and position of President. Vice President, Prime minister and council of ministers.	2

7	1,3	Structure of the judiciary: Jurisdiction and functions of Supreme Court, high court, and subordinate courts.	2
8	1,3	Federalism in the Indian constitution- Division of Powers: Union list, State list and concurrent list. Structure of state legislation, Legislative assembly and Legislative council.	2
9	1,3	Functions of state legislature, Structure of state executive-Powers and positions of Governor, Speaker, Deputy Speaker, Chief Minister and council of minister.	2
10	4	Local self-government- meaning-Three tier system, Village Panchayath-Taluk panchayat Zilla panchayath, Local bodies-Municipalities and Corporations, Bruhath Mahanagara Palike, Functions of Election commission, UPSC, KPSC.	2
11	4	Amendment of the constitution, Human Rights-Definition-constitutional provisions-right to life and liberty-Human Rights of Women-Discrimination against women steps that are to be taken to eliminate discrimination against women in Education, employment, health care, Economic and social life,	2
12	4	Status of Women in India - Women in rural areas, Constitutional Safeguards - Dowry Prohibition act 1961- Domestic violence act 2005- Sexual harassment at work place bill 2006. Human Rights of Children- Who is a child- list the Rights of the Child- Right to education, Protection of Children from Sexual Offences Act (POCSO)-2012-	2
13	1,4	National Human Rights Commission Constitution- Powers and function of the Commission-Employee rights- Provisions made, Contractual-Non contractual employee rights-Whistle blowing-definition-Aspects-Intellectual Property Rights (IPR)–Meaning-Need for protection- Briefly description of concept of patents, Copy right, Trademark	2
Total in Hours			**26 Hrs**

REFERENCES

1. Introduction to the Constitution of India- Dr. Durga Das Basu
2. Empowerment of rural women in India-Hemalatha H.M and Rameshwari Varma, Hema Prakashana.

4. CIE Assessment Methodologies

Sl. No	**Assessment**	**Test Week**	**Duration** In minutes	**Max marks**	**Conversion**
1.	CIE-1 Written Test (Theory)	7	90	50	Average of three tests 50
2.	CIE-2 Written Test (Theory)	10	90	50	
3	CIE-3 Written Test (Theory)	13	90	50	
Total CIE Marks					50
Total Marks					**50**

5. CIE Theory Test model question paper

Program				**Semester -2**	
Course Name	**Indian Constitution**			**Test**	**I/II/III**
Course Code	**Programme Specific**	**Duration**	**90 min**	**Marks**	**50**
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					

Q.No	**Questions**	**Marks**
	Section - 1	
1		25
2		
	Section - 2	
3		25
4		

Note for the Course coordinator:
Each question may have one, two, three, four or five sub divisions. Optional questions in each section carry the same weightage of marks.

Signature of the Course Coordinator Signature of the HOD Signature of the IQAC Chairman