Academic Program: UG

Academic Year 2023-24

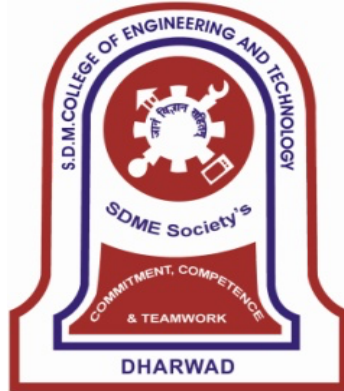## Syllabus

I & II Semester B. E.

(Under NEP 2020)

Stream: Electrical & Electronics Engineering

Branch: Electrical & Electronics Engineering

SHRI DHARMASTHALA MANJUNATHESHWARA COLLEGE OF
ENGINEERING & TECHNOLOGY,
DHARWAD – 580 002
(An Autonomous Institute Approved by AICTE & Affiliated to VTU, Belagavi
Department Accredited by NBA under Tier-1 (July 2022-June 2025)

Ph: **0836-2447465 Fax: 0836-2464638**   **Web:** www.sdmcet.ac.in

SDM College of Engineering & Technology, Dharwad

It is certified that the scheme and syllabus for I & II semester B.E. in stream Electrical & Electronics Engineering and branch Electrical & Electronics Engineering is recommended by the Board of Studies of Electrical and Electronics Engineering Department and approved by the Academic Council, SDM College of Engineering &Technology, Dharwad. This scheme and syllabus will be in force from the academic year 2023-24 till further revision.

Principal   Chairman BoS & HoD

Department of Electrical & Electronics Engineering
*(**Our motto:** **P**rofessional **C**ompetence with **P**ositive **A**ttitude)*

College Vision and Mission
Vision

To develop competent professionals with human values

Mission

- To have contextually relevant Curricula.

- To promote effective Teaching Learning Practices supported by Modern Educational Tools and Techniques.

- To enhance Research Culture

- To involve Industrial Expertise for connecting classroom content to real life situations.

- To inculcate Ethics and impart soft skill leading to overall Personality Development.

QUALITY POLICY:

In its quest to be a role model institution, committed to meet or exceed the utmost interest of all the stake holders.

CORE VALUES:

Competency

Commitment

Equity

Team work and Trust

DEPARTMENT VISION AND MISSION

Vision:
To develop globally acceptable Electrical and Electronics Engineering professionals with human values.

Mission:
- Adopting the state of the art curricula
- Practicing effective and innovative teaching-learning methodologies
- Initiating complementary learning activities to enhance competence
- Inculcating positive attitude and commitment to society.

Program Educational Objectives (PEOs)

I.   To impart the domain knowledge and soft skills to secure employment or become entrepreneur or pursue higher studies.

II.   To provide training for teamwork, leadership qualities, lifelong learning and adaptability to achieve professional growth.

III.   To develop sense of positive attitude and practice ethics to contribute positively to the society as a responsible citizen.

POs and PSOs

PO 1.Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

PO 2.Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3.Design/Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4.Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5.Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6.The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7. **Environment and Sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9. **Individual and Team work:** Function effectively as an individual and as a member or leader in diverse teams and individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12. **Life-long Learning:** long learning: Recognize the need for and have the Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PSO-1 Enhancement of professional competence in cutting edge domain through value addition activities.

PSO-2 Ability to demonstrate the skill of carrying out operation and Maintenance of electrical distribution system effectively.

PSO-3 Design and implement the electronic circuits/programs for practical applications.

SDM COLLEGE OF ENGINEERING AND TECHNOLOGY, DHARWAD
Department of Electrical & Electronics Engineering
Stream: Electrical & Electronics Engineering
I Semester
Scheme of Teaching and Examinations 2023 – 24

Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours / Week			Examination				Credits
					Theory Lecture	Tutorial	Practical / Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	ASC(IC)	22MATE11	Mathematics-I for EEE Stream	Maths	2	2	2	03	50	100	100	04
2	ASC(IC)	22PHYE12	Physics for EEE Stream	PHY	2	2	2	03	50	100	100	04
3	ESC	22EEE13	Elements of Electrical Engineering	EEE	2	2	0	03	50	100	100	03
4	ESC-I	22ESC144	Introduction to Mechanical Engineering	ME	3	0	0	03	50	100	100	03
5	ETC-I	22ETC15E	Renewable Energy Sources	EEE	3	0	0	03	50	100	100	03
6	AEC	22ENG16	Communicative English	HU	1	0	0	01	50	50	100	01
7	HSMC	22KSK17/ 22KBK17	Samskrutika Kannada/ Balake Kannada	HU	1	0	0	01	50	50	100	01
8	SDC	22IDT18	Innovation and Design Thinking	EEE	1	0	0	01	50	50	100	01
				TOTAL					400	650	800	20

Electrical & Electronics Engineering Students have to study 22EEE13- Element of Electrical Engineering compulsorily
Where as Electronics and allied stream students have to study 22BEE13 Basic Electronics compulsorily

TD/PSB- Teaching Department / Paper Setting Board, **ASC**-Applied Science Course, **ESC**- Engineering Science Courses, **ETC**- Emerging Technology Course, **AEC**-Ability Enhancement Course, **HSMS**-Humanity and Social Science and Management Course, **SDC**- Skill Development Course,

CIE–Continuous Internal Evaluation, **SEE**- Semester End Examination, **IC** – Integrated Course (Theory Course Integrated with Practical Course)

Credit Definition:	04-Credits courses are to be designed for 50 hours of Teaching-Learning Session
1-hour Lecture **(L)** per week=**1Credit**	04-Credits (IC) are to be designed for 40 hours' theory and 12-14 hours of practical sessions
2-hoursTutorial**(T)** per week=**1Credit**	
2-hours Practical / Drawing (**P**) per week=**1Credit**	03-Credits courses are to be designed for 40 hours of Teaching-Learning Session
2-hous Skill Development Actives **(SDA)** per week = **1 Credit**	02- Credits courses are to be designed for 25 hours of Teaching-Learning Session
	01-Credit courses are to be designed for 12-15 hours of Teaching-Learning sessions

Student's Induction Program: Motivating (Inspiring) Activities under the Induction program – The main aim of the induction program is to provide newly admitted students a broad understanding of society, relationships, and values. Along with the knowledge and skill of his/her study, students' character needs to be nurtured as an essential quality by which he/she would understand and fulfill the responsibility as an engineer. The following activities are to be covered in 21 days. Physical Activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to Local areas, Familiarization with Department/Branch and Innovation, etc. For details, refer the ANNEXURE-I of Induction Programs notification of the University published at the beginning of the 1st semester.

AICTE Activity Points to be earned by students admitted to BE/ B.Tech., / B. Plan day college program (For more details refer to Chapter 6, AICTE Activity Point Program, Model Internship Guidelines): Over and above the academic grades, every regular student admitted to the 4 years Degree program and every student entering 4 years Degree programs through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Program. Students transferred from other Universities to the fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card. The activities can be spread over the years, any time during the semester weekends, and holidays, as per the liking and convenience of the student from the year of entry to the program. However, the minimum hours requirement should be fulfilled. Activity Points (non-credit) do not affect SGPA/CGPA and shall not be considered for vertical progression. In case students fail to earn the prescribed activity Points, an Eighth Semester Grade Card shall be issued only after earning the required activity points. Students shall be admitted for the award of the degree only after the release of the Eighth semester Grade Card.

22MATE11 Shall have the 03 hours of theory examination (SEE), however, practical sessions question shall be included in the theory question papers. **** The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.**
22PHYE12 SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination.
ESC or ETC of 03 credits Courses shall have only a theory component (L:T :P:S=3:0:0:0) or if the nature the of course required experimental learning syllabus shall be designed as an Integrated course (L:T:P:S= 2:0:2:0),. **All 01 Credit-** courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ

CIE and SEE Evaluation

CIE for Non-integrated Courses

With LTP 3-0-0 and 4-0-0 or 2-2-0/3-2-0. Two tests + One Improvement test

20+20+20 each of one hour duration

Two higher scores from three tests are taken representing 40 marks

QP pattern: 3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub-divisions

CTA: Minimum two components such as assignments, quiz, seminar, written assignment, any technical activity related to course etc. each of 5 marks. Total CTA marks- 10

CIE= 40(from tests) +10(from CTA) = 50 marks

SEE: Exam will be conducted for 100 marks with 3 hours duration and scaled down to 50. Five modules with built in choice. Each question can be with maximum of three sub-divisions.

CIE for Integrated Courses

With LTP 2-0-2 and 3-0-2 and 2-2-2

Theory CIE component: Two tests + One Improvement test

20+20+20 each of one hour duration

Two higher scores from three tests are taken representing 40 marks

QP pattern: 3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub-divisions

Practical CIE component (CTA): Laboratory component. 5 marks for conduction, regularity, involvement, journal etc. Lab Test -5 marks. A test as per the schedule announced will be conducted at the end for 50 marks and scaled down to 5 marks. If the performance is not satisfactory in laboratory the student shall be detained and required to reregister for the course as a whole whenever offered next.

CIE= 40(from tests) +10(from CTA i.e., lab component) = 50 marks

SEE: Exam will be conducted for 100 marks with 3 hours duration and scaled down to 50. Five modules with built in choice. Each question can be with maximum of three sub-divisions. The questions shall be asked to test practical understanding for maximum of 30 marks.

CIE for AEC/HSMS Courses

With LTP 1-0-0 and 1 credit,

CIE for 1 credit AEC/HSMS Courses with LTP 1-0-0

Two tests + One Improvement test. 20+20+20 each of one hour duration

QP pattern for IA: MCQ 15 questions

Two higher scores from three tests are taken representing 40 marks

CTA: Minimum two components such as assignments, quiz, seminar, written assignment, any learning activity related to the course etc. each of 5 marks.

CIE= 40(from tests) +10(from CTA) = 50 marks

SEE: Exam will be conducted for 50 marks with 1 hour duration. There will be 50 MCQs. The question paper will contain 10 MCQ questions from each module.

SDM COLLEGE OF ENGINEERING AND TECHNOLOGY, DHARWAD
Department of Electrical & Electronics Engineering
Stream: Electrical & Electronics Engineering
II Semester
Scheme of Teaching and Examinations 2023 – 24

Sl. No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week			Examination					Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks		
					L	T	P						
1	ASC(IC)	22MATE21	Mathematics-II for EEE Stream	Maths	2	2	2	03	50	100	100	04
2	ASC(IC)	22CHEE22	Chemistry for EEE Stream	CHE	2	2	2	03	50	100	100	04
3	ESC	22CED23	Computer-Aided Engineering Drawing	ME	2	0	2	03	50	100	100	03
4	ESC-II	22ESC243	Introduction to Electronics Engineering	EEE	3	0	0	03	50	100	100	03
5	PLC-II	22PLC25D	Introduction to C++ Programming	EEE	2	0	2	03	50	100	100	03
6	AEC	22PWS26	Professional Writing Skills in English	HU	1	0	0	01	50	50	100	01
7	HSMC	22ICO27	Indian Constitution	HU	1	0	0	01	50	50	100	01
8	AEC	22SFH28	Scientific Foundations of Health	EEE	1	0	0	01	50	50	100	01
			TOTAL						**400**	**650**	**800**	**20**

TD/PSB- Teaching Department / Paper Setting Board, **ASC**-Applied Science Course, **ESC**- Engineering Science Courses, **ETC**- Emerging Technology Course, **AEC**- Ability Enhancement Course, **HSMC**-Humanity and Social Science and Management Course, **SDC**- Skill Development Course, **CIE** -Continuous Internal Evaluation, **SEE**- Semester End Examination, **IC** – Integrated Course (Theory Course Integrated with Practical Course)

22MATE21 Shall have the 03 hours of theory examination (SEE), however, practical sessions question shall be included in the theory question papers. **** The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.**

22CHEE22- SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination

ESC or ETC of 03 credits Courses shall have only a theory component (L:T :P:S=3:0:0:0) or if the nature the of course required practical learning, syllabus shall be designed as an Integrated course (L:T:P:S= 2:0:2:0)**All 01 Credit-** courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ

CIE and SEE Evaluation

CIE for Non-integrated Courses

With LTP 3-0-0 and 4-0-0 or 2-2-0/3-2-0.   Two tests + One Improvement test

 20+20+20 each of one hour duration

Two higher scores from three tests are taken representing 40 marks

QP pattern: Continue the existing (3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub-divisions)

CTA: Minimum two components such as assignments, quiz, seminar, written assignment, any technical activity related to course etc. each of 5 marks. Total CTA marks- 10

CIE= 40(from tests) +10(from CTA) = 50 marks

SEE: Exam will be conducted for 100 marks with 3 hours duration. Five modules with built in choice. Each question can be with maximum of three sub-divisions.

CIE for Integrated Courses

With LTP 2-0-2 and 3-0-2 and 2-2-2

Theory CIE component: Two tests + One Improvement test

 20+20+20 each of one hour duration

Two higher scores from three tests are taken representing 40 marks

QP pattern: Continue the existing (3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub-divisions)

Practical CIE component (CTA): Laboratory component. 5 marks for conduction, regularity, involvement, journal etc. Lab Test -5 marks. A test as per the schedule announced will be conducted at the end for 50 marks and scaled down to 5 marks. If the performance is not satisfactory in laboratory the student shall be detained and required to reregister for the course as a whole whenever offered next.

CIE= 40(from tests) +10(from CTA i.e., lab component) = 50 marks

SEE: Exam will be conducted for 100 marks with 3 hours duration. Five modules with built in choice. Each question can be with maximum of three sub-divisions. The questions shall be asked to test practical understanding for maximum of 30 marks.

CIE for AEC/HSMS Courses

With LTP 1-0-0 and 1 credit,

CIE for 1 credit AEC/HSMS Courses with LTP 1-0-0

Two tests + One Improvement test.   20+20+20 each of one hour duration

QP pattern for IA: MCQ 15 questions

Two higher scores from three tests are taken representing 40 marks

CTA: Minimum two components such as assignments, quiz, seminar, written assignment, any learning activity related to the course etc. each of 5 marks.

CIE= 40(from tests) +10(from CTA) = 50 marks

SEE: Exam will be conducted for 50 marks with 1 hour duration. There will be 50 MCQs. The question paper will contain 10 MCQ questions from each module.

I Semester

22MATE11	Mathematics-I for Electrical & Electronics Stream	(2:2:2)4

<div align="right">Contact Hours:40</div>

Course objectives: The goal of the course

- ➢ **Familiarize** the importance of calculus associated with one variable and multi-variable for Electrical & Electronics Engineering.
- ➢ **Analyze** Electrical & Electronics engineering problems by applying Ordinary Differential Equations.
- ➢ **Develop** the knowledge of Linear Algebra to solve the system of equations.

Course outcomes (COs):

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level(3)	Moderate Level(2)	Slight Level(1)
CO1	Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation	--	--	1
CO2	Analyze the solution of linear and nonlinear ordinary differential equations.	--	--	1
CO3	Apply the concept of change of order of integration and variables to evaluate multiple Integrals and their usage in computing area and volume.	--	2	-
CO4	Make use of matrix theory for solving for system of linear equations and compute Eigen values and Eigen vectors	--	--	1
CO5	Familiarize with modern mathematical tools namely MATHEMATICA /MATLAB /PYTHON/SCILAB	--	2	--

POs/PSOs	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mapping Level	1	2	--	---	--	--	--	--	--	--	--	--	--	--

Course Contents:

Module–I Calculus(08 Hrs.)
Introduction to polar coordinates and curvature relating to EC & EE Engineering
Applications: Polar coordinates, Polar curves, angle between the radius vector and the tangent, angle between two curves. Pedal equations. Curvature and Radius of curvature-Cartesian, Parametric, Polar and Pedal forms. Problems.
 Self-study: Center and circle of curvature, evolutes and involutes.
 Applications: Communication signals, Manufacturing of microphones and Image Processing.
08Hrs

Module–II Series Expansion and Multivariable Calculus (08 Hrs.)
Introduction of series expansion and partial differentiation in EC&EE Engineering
Applications. Taylor's and Maclaurin's series expansion for one variable (Statement only)–problems. Indeterminate forms-L'Hospital's rule-Problems. Partial differentiation, total derivative-differentiation of composite functions. Jacobian and problems. Maxima and minima for a function of two variables. Problems.
Self -study: Euler's Theorem and problems. Method of Lagrange's undetermined multipliers with single constraint.
Applications: Series expansion in communication signals, Errors and approximations, and vector calculus.
08Hrs

Module–III Ordinary Differential Equations(ODEs) of first order (08 Hrs.)

Introduction to first-order ordinary differential equations pertaining to the applications forvEC&EE engineering.
Linear and Bernoulli's differential equations. Exact and reducible to exact differential equations-Integrating factors on

$\frac{1}{N}\left(\frac{\partial M}{\partial v} - \frac{\partial N}{\partial x}\right)$ and $\frac{1}{M}\left(\frac{\partial N}{\partial x} - \frac{\partial M}{\partial v}\right)$,-Orthogonal trajectories(Cartesian), L-R circuits, Problems.

Non-linear differentia equations: Introduction to general and singular solutions, Solvable for p only, Clairaut's equations, reducible to Clairaut's equations. Problems.
Self-Study: Applications of ODEs, Solvable for x and y.
Applications of ordinary differential equations: Rate of Growth or decay, Conduction of heat, C-R circuits.

Module–IV   Integral Calculus (08 Hrs.)

Introduction to Integral Calculus in EC & EE Engineering Applications.

Multiple Integrals: Evaluation of double and triple integrals, evaluation of double integrals by change of order of integration, changing into polar coordinates. Applications to find Area and Volume by double integral. Problems.

Beta and Gamma functions: Definitions, properties, relation between Beta and Gamma functions. Problems.

Self-Study: Volume by triple integration, Centre of gravity.

Applications: Antenna and wave propagation, Calculation of optimum power in electrical circuits, field theory.

Module-V Linear Algebra (08 Hrs.)

Introduction of linear algebra related to EC & EE engineering Applications.

Elementary row transformation of a matrix, Rank of a matrix. Consistency and Solution of system of linear equations - Gauss-elimination method, Gauss-Jordan method and approximate solution by Gauss-Seidel method. Eigen values and Eigen vectors, Rayleigh's power method to find the dominant Eigen value and Eigen vector.

Self study: Solution of system of equations by Gauss-Jacobi iterative method. Inverse of a square matrix by Cayley- Hamilton theorem.

Applications of Linear Algebra: Network Analysis, Markov Analysis, Critical point of a network system. Optimum solution.

List of Laboratory experiments (2 hours/week per batch/batch strength15)

10 lab sessions +1 repetition class +1 Lab Assessment

1   2D plots for Cartesian and polar curves
2   Finding angle between polar curves, curvature and radius of
     curvature of a given curve
3   Finding partial derivatives, Jacobian and plotting the graph
4   Applications to Maxima and Minima of two variables
5   Solution of first-order differential equation and plotting the graphs
6   Program to compute area, volume and centre of gravity
7   Evaluation of improper integrals
8   Numerical solution of system of linear equations, test for
     consistency and graphical representation.
9   Solution of system of linear equations using Gauss-Seidel iteration method
10   Compute eigen values and eigen vectors and find the largest
     and smallest eigen value by Rayleigh power method.

Suggested software's: Mathematica /MatLab /Python/ Scilab

Suggested Learning Resources:

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

Text Books

1. **B. S. Grewal**: "Higher EngineeringMathematics", Khanna publishers, 44^{th}Ed.,2021.
2. **E. Kreyszig**: "Advanced Engineering Mathematics", John Wiley & Sons, 10th Ed., 2018.

Reference Books

1. **V. Ramana:** "Higher Engineering Mathematics" , McGraw-Hill Education,11^{th}Ed.,2017
2. **Srimanta Pal & Subodh C. Bhunia**: "Engineering Mathematics" Oxford University Press, 3^{rd}Ed.,2016.
3. **N. P. Bali and Manish Goyal**: "A text book of Engineering Mathematics" Laxmi Publications, 10th Ed., 2022.
4. **C. Ray Wylie, Louis C. Barrett:**"Advanced Engineering Mathematics" , McGraw–Hill Book Co., Newyork, 6^{th}Ed.,2017.
5. **Gupta C. B, Sing S. R and Mukesh Kumar:**"Engineering Mathematic for Semester I and II", Mc- Graw Hill Education (India) Pvt.Ltd 2015.
6. **H.K. Dass and Er.RajnishVerma:**"Higher Engineering Mathematics", S.Chand Publication, 3^{rd}Ed.,2014.
7. **James Stewart: "**Calculus" , Cengage Publications, 7^{th}Ed.,2019.
8. **David C Lay:** "Linear Algebra and its Applications", Pearson Publishers, 4th Ed., 2018.
9. **Gareth Williams:** "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6th Ed., 2017.

Web links and Video Lectures (e-Resources):

- http://nptel.ac.in/courses.php?disciplineID=111
- http://www.class-central.com/subject/math(MOOCs)
- http://academicearth.org/
- VTU e-Shikshana Program
- VTU EDUSAT Program

Course Title:	**Physics for Electrical & Electronics Engineering Stream**		
Course Code:	**22PHYE12**	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03+02
Total Hours of Pedagogy	40 hours+10-12 Lab Slots	Credits	04

Course objectives
- To study the principles of quantum mechanics
- To understand the properties of conductors, dielectrics and superconductors
- To study the essentials of photonics for engineering applications.
- To study the Fundamentals of Photoconductivity and Photovltaics.
- To study the knowledge about semiconductors and devices.

Teaching-Learning Process

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective
1. Flipped Class
2. Chalk and Talk
3. Blended Mode of Learning
4. Simulations, Interactive Simulations and Animations
5. NPTEL and Other Videos for theory topics
6. Smart Class Room
7. Lab Experiment Videos

Module-1 (08 Hours)

Quantum Mechanics:

de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg's Uncertainty Principle and its application (Non-existence of electron inside the nucleus-Non Relativistic), Wave Function, Time independent Schrodinger wave equation, Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one-dimensional infinite potential well, Waveforms and Probabilities. Numerical Problems

Pre-requisite: Wave-Particle dualism

Self-learning: de Broglie Hypothesis

Module-2 (08 hours)

Electrical Properties of Solids:

Quantum free electron theory: Introduction, Fermi factor - Density of states and their temperature dependence. Expression for Electric resistivity of a conductor merits of Quantum free electron theory.

Dielectrics: Introduction, solid, liquid and gaseous dielectrics. Application of dielectrics in transformers, Capacitors, and Electrical Insulation.

Superconductivity: Introduction to Superconductors, Temperature dependence of resistivity, Meissner's Effect, Silsbee Effect, Types of Super Conductors, Temperature dependence of Critical field, BCS theory (Qualitative), High-Temperature superconductivity, SQUID, MAGLEV. Numerical Problems

Pre-requisites: Difference between Insulators & Dielectrics.

Self-learning: Dielectrics Basics

Module-3 (08 hours)

Lasers and Optical Fibers:

Lasers: Characteristics of LASER, Interaction of radiation with matter, Expression for energy density equation and its significance. Requisites of a Laser system. Conditions for Laser action. Principle, Construction and working of Semiconducting Laser. LIDAR, Laser drilling and Laser beam welding. Numerical problems.

Optical Fibers: Propagation mechanism, TIR, angle of acceptance, Numerical aperture, fractional index change, Modes of propagation, Number of modes and V parameter, Types of optical fibers. Attenuation and Mention of expression for attenuation coefficient, Attenuation spectrum of an optical fiber with optical windows. Discussion of the block diagram of point-to-point communication, Intensity-based fiber optic displacement sensor, Merits and demerits. Numerical problems.

Pre-requisite: Properties of light

Self-learning: Propagation Mechanism &TIR in optical fiber

Module-4(08 hours)

Photoconductivity and Photovoltaics:

Introduction, Photoconductivity in Insulating Crystals, Simple Model of Photoconductor, Effect of Traps, Space charge effects, Effect of Impurity in Photoconductivity, Applications – Photo Conductive Cell – Construction, working and Spectral response. Applications of photoconductivity – photo diode and phototransistor. . Solar cell – Construction, Working and Output characterization, Applications of solar cells.

Pre requisites: Basics of atomic and molecular structure, quantum optics.

Self learning: Energy bands in solids

Module-5 (08 hours)

Semiconductor Physics:

Fermi energy and Fermi level, Fermi level in intrinsic semiconductors (derivation), Expression for concentration of electrons in conduction band & holes concentration in valance band (only mention the expression), Law of mass action, Electrical conductivity of a semiconductor (derivation), Hall effect, Expression for Hall coefficient (derivation) and its application. Direct and Indirect bandgap semiconductors (qualitative), Four probe method to determine resistivity, Numerical problems.

Pre-requisite: Basics of Semiconductors
Self-learning: Photodiode

Course outcome (Course Skill Set)
At the end of the course the student will be able to:

CO1	**Describe** the fundamental principles of Quantum Mechanics and the essentials of Photonics
CO2	**Elucidate** the concepts of Conductors, dielectrics and superconductivity
CO3	**Explicate** Fundamentals of Laser and Optical fibers and Applications.
CO4	**Discuss** the fundamentals Photoconductivity and Photovoltaics and their applications.
CO5	**Summarize** the properties of semiconductors and the working principles of semiconductor devices
CO6	**Practice** working in groups to conduct experiments in physics and perform precise and honest measurements

Suggested Learning Resources:

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
2. An Introduction to Lasers theory and applications by M.N.Avadhanulu and P.S.Hemne revised Edition 2012. S. Chand and Company Ltd -New Delhi.
3. Engineering Physics-Gaur and Gupta-Dhanpat Rai Publications-2017.
4. Concepts of Modern Physics-Arthur Beiser: 6th Ed;Tata McGraw Hill Edu Pvt Ltd- New Delhi 2006.
5. Fundamentals of Fibre Optics in Telecommunication & Sensor Systems, B.P. Pal, New Age International Publishers.
6. Modern Physics for Engineers – S. P. Taneja, R. Chand and Co., New Delhi.
7. Lasers and Non-Linear Optics – B.B. Laud, 3rd Ed, New Age International Publishers 2011.
8. LASERS Principles, Types and Applications by K.R. Nambiar-New Age International Publishers.
9. Solid State Physics-S O Pillai, 8th Ed- New Age International Publishers-2018.

Web links and Video Lectures (e-Resources):

Laser: https://www.britannica.com/technology/laser,k
Laser:https://nptel.ac.in/courses/115/102/115102124/
Quantum mechanics:https://nptel.ac.in/courses/115/104/115104096/
Physics:http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html
Numerical Aperture of fiber:https://bop-iitk.vlabs.ac.in/exp/numerical-aperture-measurement**NPTEL**
Supercoductivity:https://archive.nptel.ac.in/courses/115/103/115103108/

Activity-Based Learning (Suggested Activities in Class)/Practical-Based Learning

http://nptel.ac.in

https://swayam.gov.in

https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham

https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1

https://virtuallabs.merlot.org/vl_physics.html

https://phet.colorado.edu

https://www.myphysicslab.com

Laboratory Component:

Any Ten Experiments have to be completed from the list of experiments

Note: The experiments have to be classified into

a) Exercise

b) Demonstration

c) Structured Inquiry

d) Open Ended

Based on convenience classify the following experiments into the above categories. Select at least one simulation/spreadsheet activity.

List of Experiments:

1. Wavelength of LASER using Grating
2. Numerical Aperture using optical fiber
3. Four Probe Method
4. Charging and Discharging of a Capacitor
5. Transistor Characteristics
6. Photo-Diode Characteristics
7. Series and Parallel LCR Circuits
8. Magnetic Field at any point along the axis of a circular coil
9. Plank's Constant using LEDs.
10. Fermi Energy
11. Black Box
12. Energy Gap of the given Semiconductor
13. Dielectric Constant
14. PHET Interactive Simulations
    (https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype)
15. Online Circuit Simulator (https://www.partsim.com/simulator)
16. Study of Electrical quantities using spreadsheet

COs and POs Mapping (Individual teacher has to fill up)

COs	POs											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	2	-	-	-	-	-	-	-	-	-	2
CO3	3	2	-	-	-	-	-	-	-	-	-	2
CO4	3	2	-	-	1	-	-	-	-	-	-	2
CO5	3	2	1	-	2	-	-	3	3	-	-	2

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

Note: The CO-PO mapping values are indicative. The course coordinator can alter the mapping using **Competency and Performance Indicators** mentioned in the **AICTE Exam reforms.**

Course Title:		**Elements of Electrical Engineering**		
Course Code:		**22EEE13**	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory		SEE Marks	50
			Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:0:0		Exam Hours	03
Total Hours of Pedagogy	40 hours		Credits	03

Course objectives
- To explain the basic laws used in the analysis of DC circuits, electromagnetism.
- To explain the behavior of circuit elements in single-phase circuits.
- To explain three phase circuits, balanced loads and measurement of three phase power.
- To explain the measuring techniques, measuring instruments and domestic wiring.
- To explain electricity billing, equipment and personal safety measures.

Teaching-Learning Process
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective
1. Chalk and talk
2. Animated/NPTEL videos
3. Cut sections
4. PPTs

Module-1 (08 Hrs)

DC circuits: Ohm's law and Kirchhoff's laws, analysis of series, parallel and series-parallel circuits. Power and energy.
Electromagnetism: Faraday's Laws of Electromagnetic Induction, Lenz's Law, Flemings rules, statically and dynamically induced EMF; concepts of self and mutual inductance. Coefficient of Coupling. Energy stored in magnetic field. Simple Numerical.

Module-2 (08 Hrs)

Single-phase AC circuits: Generation of sinusoidal voltage, frequency of generated voltage, average value, RMS value, form factor and peak factor of sinusoidal voltage and currents.
Phasor representation of alternating quantities. Analysis of R, L, C, R-L, R-C and R-L-C circuits with phasor diagrams, Real power, reactive power, apparent power, and Power factor. Series, Parallel and Series-Parallel circuits. Simple Numerical.

Module-3 (08 Hrs)

Three-phase AC circuits: Necessity and advantage of 3-phase system. Generation of 3-phase power. Definition of phase sequence. Balanced supply and balanced load. Relationship between line and phase values of balanced star and delta connections. Power in balanced 3-phase circuits. Measurement of 3-phase power by 2-wattmeter method. Simple Numerical.

Module-4 (08 Hrs)

Measuring instruments: construction and working principle of whetstone's bridge, Kelvin's double bridge, Megger, Maxwel's bridge for inductance, Schering's bridge for capacitance, concepts of current transformer and potential transformer. (Only balance equations and Excluding Vector diagram approach)
Domestic Wiring: Requirements, Types of wiring: casing, capping. Two way and three way control of load.

Module-5 (08 Hrs)

Electricity bill: Power rating of household appliances including air conditioners, PCs, laptops, printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.
Equipment Safety measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.
Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock, and Residual Current Circuit Breaker (RCCB) and Earth Leakage Circuit Breaker (ELCB).

Course outcome (Course Skill Set)	
At the end of the course the student will be able to:	
CO1	Understand the concepts of DC circuits and Electromagnetism.
CO2	Understand the concepts of single phase and Three phase AC circuits.
CO3	Apply the basic Electrical laws to solve circuits.
CO4	Understand the concepts of measurements and measuring Instruments
CO5	Explain the concepts of domestic wiring, electricity billing, circuit protective devices and personal safety measures.

Suggested Learning Resources:
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)
    Text Books:
1. Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

    Reference Books:
1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Electrical Technology by E. Hughes, Pearson, 12th Edition, 2016.
4. Electrical and electronic measurements and instrumentation by A K Sawhney, Dhanapat Rai and Co. edition, January 2015

Web links and Video Lectures (e-Resources):
- www.nptel.ac.in

COs and POs Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	0	1	1	1	1	0	0	0	1
CO2	3	3	2	1	1	1	0	0	0	0	0	1
CO3	3	2	1	1	1	1	1	1	0	0	0	1
CO4	3	2	2	1	0	1	1	1	0	0	0	1
CO5	3	1	2	0	1	2	1	1	0	0	1	1

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

Course Title:	INTRODUCTION TO MECHANICAL ENGINEERING			
Course Code:	**22ESC144**	CIE Marks	50	
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50	
		Total Marks	100	
Teaching Hours/Week (L:T:P: S)	2:2:0:0	Exam Hours	03	
Total Hours of Pedagogy	40 hours	Credits	03	

Course Learning Objectives
- To develop basic Knowledge on Mechanical Engineering, Fundamentals and Energy Sources.
- Understand the concept of different types of Machine tool operations and Modern Manufacturing Processes like CNC, 3D printing.
- To know the concept of IC engines and Future Mobility vehicles.
- To give exposure in the field of Engineering Materials and Manufacturing Processes Technology and its applications
- To acquire a basic understanding role of Mechanical Engineering in the Robotics and Automation in industry.

Teaching-Learning Process
- Adopt different types of teaching methods to develop the outcomes through PowerPoint presentations and Video demonstrations or Simulations.
- Arrange visits to show the live working models other than laboratory topics.
- Adopt collaborative (Group Learning) Learning in the class.
- Adopt Problem Based Learning (PBL), which fosters students Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information.

Module-1 (8 hours)

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

Energy: Introduction and applications of Energy sources like Fossil fuels, Nuclear fuels, Hydel, Solar, wind, and bio-fuels, Environmental issues like Global warming and Ozone depletion

Module-2 (8 hours)

Machine Tool Operations:
Working Principle of lathe, Lathe operations: Turning, facing, knurling. Working principles of Drilling Machine, drilling operations: drilling, boring, reaming. Working of Milling Machine, Milling operations: plane milling and slot milling.
 (No sketches of machine tools, sketches to be used only for explaining the operations).
Introduction to Advanced Manufacturing Systems: Introduction, components of CNC, advantages and applications of CNC, 3D printing.

Module-3 (8 hours)

Introduction to IC Engines: Components and Working Principles, 4-Strokes Petrol and Diesel Engines, Application of IC Engines.

Insight into Future Mobility; Electric and Hybrid Vehicles, Components of Electric and Hybrid Vehicles. Advantages and disadvantages of EVs and Hybrid vehicles.

Module-4 (8 hours)

Engineering Materials: Types and applications of Ferrous & Nonferrous Metals, silica, ceramics, glass, graphite, diamond and polymer. Shape Memory Alloys.
Joining Processes: Soldering, Brazing and Welding, Definitions, classification of welding process, Arc welding, Gas welding and types of flames.

Module-5 (8 hours)

Introduction to Mechatronics and Robotics: open-loop and closed-loop mechatronic systems. Classification based on robotics configuration: polar cylindrical, Cartesian coordinate and spherical. Application, Advantages and disadvantages.

Automation in industry: Definition, types – Fixed, programmable and flexible automation, basic elements with block diagrams, advantages.

Introduction to IOT: Definition and Characteristics, Physical design, protocols, Logical design of IoT, Functional blocks, and communication models.

Course Outcome (Course Skill Set)

At the end of the course the student will be able to:

CO1	Explain the concepts of Role of Mechanical Engineering and Energy sources.
CO2	Describe the Machine Tool Operations and advanced Manufacturing process.
CO3	Explain the Working Principle of IC engines and EV vehicles.
CO4	Discuss the Properties of Common Engineering Materials and various Metal Joining Processes.
CO5	Explain the Concepts of Mechatronics, Robotics and Automation in IoT

Suggested Learning Resources:
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)
Text Books:

1. Elements of Mechanical Engineering, K R Gopala Krishna, Subhash Publications, 2008
2. An Introduction to Mechanical Engineering, Jonathan Wickert and Kemper Lewis, Third Edition, 2012

Reference Books:

1. Elements of Workshop Technology (Vol. 1 and 2), Hazra Choudhry and Nirzar Roy, Media Promoters and Publishers Pvt. Ltd., 2010.
2. Manufacturing Technology- Foundry, Forming and Welding, P.N.Rao Tata McGraw Hill 3rdEd., 2003.
3. Internal Combustion Engines, V. Ganesan, Tata McGraw Hill Education; 4th edition, 2017
4. Robotics, Appu Kuttan KK K. International Pvt Ltd, volume 1
5. Dr SRN Reddy, Rachit Thukral and Manasi Mishra, " Introduction to Internet of Things: A Practical Approach", ETI Labs
6. Raj kamal, " Internet of Things: Architecture and Design", McGraw hill.

Web links and Video Lectures (e-Resources):

- https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing- and-process-industry/)
- Videos | Makino (For Machine Tool Operation)

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Demonstration of lathe/milling/drilling operations
- Demonstration of working of IC Engine.
- Study arc welding, oxy-acetylene gas flame structure.
- Video demonstration of latest trends in mobility robotics and Automation
- Demonstration of developing models on machine tools

COs and POs Mapping

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3					1	2			1		1
CO2	3					1	1			1		1
CO3	3					1	1			1		1
CO4	3					1	1			1		1
CO5	3					1	1			1		1

Level 3- Highly Mapped,   Level 2-Moderately Mapped,   Level 1-Low Mapped,   Level 0- Not Mapped

RENEWABLE ENERGY SOURCES

Course Code:	22ETS15E	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03

Course objectives
- To understand energy scenario, energy sources and their utilization.
- To explore society's present needs and future energy demands.
- To Study the principles of renewable energy conversion systems.
- To exposed to energy conservation methods.

Teaching-Learning Process
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective
1. Use pie chart showing distribution of renewable energy sources
2. Use wind turbine models
3. Use sun path diagrams

Module-1 (08 hours)

Introduction: Principles of renewable energy; energy and sustainable development, fundamentals and social implications. worldwide renewable energy availability, renewable energy availability in India, brief descriptions on solar energy, wind energy, tidal energy, wave energy, ocean thermal energy, biomass energy, geothermal energy, oil shale. Introduction to Internet of energy (IOE).

Module-2 (08 hours)

Solar Energy: Fundamentals; Solar Radiation; Estimation of solar radiation on horizontal and inclined surfaces; Solar radiation Measurements- Pyrheliometers, Pyrometer, Sunshine Recorder. Solar Thermal systems: Flat plate collector; Solar distillation; Solar pond electric power plant.

Solar electric power generation- Principle of Solar cell, Photovoltaic system for electric power generation, advantages, Disadvantages and applications of solar photovoltaic system.

Module-3 (08 hours)

Wind Energy: Properties of wind, availability of wind energy in India, wind velocity and power from wind; major problems associated with wind power, Basic components of wind energy conversion system (WECS); Classification of WECS- Horizontal axis- single, double and muliblade system. Vertical axis- Savonius and darrieus types.

Biomass Energy: Introduction; Photosynthesis Process; Biofuels; Biomass Resources; Biomass conversion technologies -fixed dome; Urban waste to energy conversion; Biomass gasification (Downdraft) .

Module-4 (08 hours)

Tidal Power: Tides and waves as energy suppliers and their mechanics; fundamental characteristics of tidal power, harnessing tidal energy, advantages and limitations.
Ocean Thermal Energy Conversion: Principle of working, OTEC power stations in the world, problems associated with OTEC.

Module-5 (08 hours)

Green Energy: Introduction, Fuel cells: Classification of fuel cells – H_2; Operating principles, Zero energy Concepts. Benefits of hydrogen energy, hydrogen production technologies (electrolysis method only), hydrogen energy storage, applications of hydrogen energy, problem associated with hydrogen energy.

Course outcome (Course Skill Set)	
At the end of the course the student will be able to:	
CO1	Describe the environmental aspects of renewable energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
CO2	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation.
CO3	Understand the conversion principles of wind and tidal energy
CO4	Understand the concept of biomass energy resources and green energy.
CO5	Acquire the basic knowledge of ocean thermal energy conversion and hydrogen energy.

Reference Books:

1. Principles of Energy conversion, A. W. Culp Jr.,, McGraw Hill, 1996
2. Non-Convention EnergyResources, Shobh Nath Singh, Pearson, 2018

Web links and Video Lectures (e-Resources):

- E-book URL: https://www.pdfdrive.com/non-conventional-energy-sources-e10086374.html
- E-book URL:https://www.pdfdrive.com/non-conventional-energy-systems-nptel- d17376903.html
- E-book URL: https://www.pdfdrive.com/renewable-energy-sources-and-their-applications- e33423592.html
- E-book URL: https://www.pdfdrive.com/lecture-notes-on-renewable-energy-sources- e34339149.html
- https://onlinecourses.nptel.ac.in/noc18_ge09/preview

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Poster presentation on the theme of renewable energy sources
- Industry Visit

COs and POs Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2						3					1
CO2	2						3					1
CO3	2						3					1
CO4	2						3					1
CO5	2						3					1

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

Suggested Learning Resources:
Text Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Nonconventional Energy sources, G D Rai, Khanna Publication, Fourth Edition,
2. Energy Technology, S.Rao and Dr. B.B. Parulekar, Khanna Publication.Solar energy, Subhas P Sukhatme, Tata McGraw Hill, 2nd Edition,1996.

22ENG16	Communicative English	(1-0-0) 1
Contact Hours: 13	CIE: 50 Marks	SEE: 50 Marks	Exam Duration 01 hour

Course Learning Objectives (CLOs): This course focuses on the following learning perspectives:

- To know about Fundamentals of Communicative English and Communication Skills in general.
- To train to identify the nuances of phonetics, intonation and enhance pronunciation skills for better Communication skills.
- To impart Basic English grammar and essentials of important language skills.
- To enhance with English vocabulary and language proficiency for better communication skills.
- To learn about Techniques of Information Transfer through presentation.

Course Outcomes (COs):

Description of the Course Outcome: At the end of the course the student will be able to:	Mapping to POs(1-12) / PSOs (1-3)		
	Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1 **Apply** the Fundamentals of Communication Skills in their Career.		10	
CO-2 **Identify** the nuances of phonetics, intonation and **enhance** pronunciation skills.		10	
CO-3 **Impart** basic English grammar and essentials of language skills as per present requirement.	10		
CO-4 **Acquire** vocabulary and language proficiency.		10	
CO-5 **Adopt** the Techniques of Information Transfer through presentation.	10		

POs/PSOs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mapping Level										2.4						

Pre-requisites: None

Course Contents:

Module-I (3 hours)

Introduction to Communicative English : meaning and Definition, Fundamentals of Communicative English, Process of Communication, Barriers to Effective Communicative English, Different styles and levels in Communicative English. Interpersonal and Intrapersonal Communication Skills.

Module-II (Language Lab) (3 hours)

Introduction to Phonetics: Sounds- consonants, vowels and diphthongs, Syllables and Structure. Word Accent, Stress Shift and Intonation, Phonetic Transcription, Common Errors in Pronunciation.

Module-III (Language Lab) (2 hours)

Vocabulary: Word formation Synonyms, Antonyms, Homophones, Homonyms, Affixes, Abbreviations, Strong and Weak forms of Words, Word pairs, One Word Substitutes and Error identification.

Module-IV (3 hours)

Grammar: Parts of Speech, Articles and Preposition Tense, Sentences, Kinds of sentences, types of sentences, Transformation. of sentences Question Tags and Exercises on it.

Module-V (3 hours)

Communication Skills for Employment: Presentation Skills, Extempore, Public Speaking, Mother Tongue Influence (MTI), Reading and Listening Comprehensions – Exercises.

Reference Books:

1 Communication Skills by Sanjay Kumar & PushpLata, Oxford University Press India Pvt Ltd - 2019

2 A Textbook of English Language Communication Skills, (ISBN-978-81-955465-2-7), Published by Infinite Learning Solutions, Bengaluru - 2022.

3 Technical Communication by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.

4 English for Engineers by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.

5 English Language Communication Skills – Lab Manual cum Workbook, Cengage learning India Pvt Limited [Latest Revised Edition] – (ISBN-978-93-86668-45-5), 2019.

6 A Course in Technical English – D Praveen Sam, KN Shoba, Cambridge University Press – 2020.

7   Practical English Usage by Michael Swan, Oxford University Press – 2016.

8. Rogers, C., Farson, R. E. Active Listening. Gordon Training Inc., www.gordontraining.com/free-workplace- articles/active-listening/, Extract from 1957 article

9. Wood, Frederick. A Remedial English Grammar for Foreign Students. Macmillan Education, India, 1990.

10. Yadugiri, M A. Making Sense of English - A Textbook of Sounds, Words and Grammar, Viva Books, 2020.

Question Paper Pattern (SEE)

1. MCQ on all Modules: 50X1 = 50 marks

Question Paper Pattern (CIE: 3 Internal Assessments)

1. MCQ on covered Modules: 20X1 = 20 marks

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ - ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ

Course Title:	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Course Code:	22KSK17	**CIE Marks**	**50**
Course Type (Theory/Practical /Integrated	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

Course objectives : ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

The course (22KSK17/27) will enable the students,

1. ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಪರಿಚಯಿಸಿವುದು.
3. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
4. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
5. ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching-Learning Process - General Instructions) :

These are sample Strategies, which teacher can use to accelerate the attainment of the course outcomes.

1. ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಬೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧಾರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.
2. ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು - ಅಂದರೆ ಕವಿ-ಕಾವ್ಯ ಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪಿಟಿ, ಡಿಜಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು.
3. ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಬೋಧನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.

ಘಟಕ -1   ಕನ್ನಡ ಸಂಸ್ಕೃತಿ ಮತ್ತು ಭಾಷೆ ಕುರಿತಾದ ಲೇಖನಗಳು (03 hours of pedagogy)

1. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ - ಹಂಪ ನಾಗರಾಜಯ್ಯ
2. ಕರ್ನಾಟಕದ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ - ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯ
3. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೋ. ವಿ. ಕೇಶವಮೂರ್ತಿ

ಘಟಕ - 2   ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ   (03 hours of pedagogy)

1. ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ.
2. ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ – ಪುರಂದರದಾಸರು
   ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ - ಕನಕದಾಸರು
3. ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು - ಶಿಶುನಾಳ ಶರೀಫ

ಘಟಕ -3   ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ   (03 hours of pedagogy)

1. ಡಿವಿಜಿ ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಅಯ್ದ ಕೆಲವು ಭಾಗಗಳು
2. ಕುರುಡು ಕಾಂಚಾಣ : ದಾ.ರಾ. ಬೇಂದ್ರೆ
3. ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು

ಘಟಕ - 4   ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ   (03 hours of pedagogy)

1. ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ – ಎ. ಎನ್. ಮೂರ್ತಿರಾವ್
2. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ

ಘಟಕ - 5   ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ   (03 hours of pedagogy)

1. ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ
2. ಮೇಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ

University Prescribed Textbook :

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ
ಡಾ. ಹಿ.ಚಿ.ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ,
ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,
ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

ವಿಶೇಷ ಸೂಚನೆ : 1. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮಕ್ಕೆ ಸೀಮಿತವಾಗಿ ಅಂತಿಮ ಪರೀಕ್ಷೆಯ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ ಇರುತ್ತದೆ.

2. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮವನ್ನು ಹೊರತುಪಡಿಸಿದ ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿನ ಉಳಿದ ಪದ್ಯ & ಗದ್ಯ ಭಾಗ ಹಾಗೂ ಇತರ ಲೇಖನಗಳನ್ನು ಹೆಚ್ಚುವರಿ ಪೂರಕ ಓದಿಗಾಗಿ ಬಳಸಿಕೊಳ್ಳಬಹುದು. ಅಂತಿಮ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಈ ಪಾಠಗಳಿಂದ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲಾಗುವುದಿಲ್ಲ.

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3. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.

4. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning
- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions, Seminars and assignments.

ಬಳಕೆ ಕನ್ನಡ - baLake Kannada (Kannada for Usage)

Course Title:	ಬಳಕೆ ಕನ್ನಡ		
Course Code:	**22KBK17**	CIE Marks	50
Course Type (Theory/Practical /Integrated	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

Course objectives : ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

The course (22K**B**K17   will enable the students,

1. To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
2. To enable learners to Listen and understand the Kannada language properly.
3. To speak, read and write Kannada language as per requirement.
4. To train the learners for correct and polite conservation.
5. To know about Karnataka state and its language, literature and General information about this state.

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching-Learning Process - General Instructions) :

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.

1. ಬಳಕೆ ಕನ್ನಡವನ್ನು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಬೋಧಿಸಲು ವಿಟಿಯು ಸೂಚಿಸಿರುವ ಪಠ್ಯಪುಸ್ತಕವನ್ನು ಉಪಯೋಗಿಸಬೇಕು.

2. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಉತ್ತೇಜಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.

3. ಪ್ರತಿ ವಿದ್ಯಾರ್ಥಿ ಪುಸ್ತಕವನ್ನು ತರಗತಿಯಲ್ಲಿ ಬಳಸುವಂತೆ ನೋಡಿಕೊಳ್ಳುವುದು ಮತ್ತು ಪ್ರತಿ ಪಾಠ ಮತ್ತು ಪ್ರವಚನಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಪೂರಕ ಚಟುವಟಿಕೆಗಳಿಗೆ ತೊಡಗಿಸತಕ್ಕದ್ದು.

4. ಡಿಜಿಟಲ್ ತಂತ್ರಜ್ಞಾನದ ಮುಖಾಂತರ ಇತ್ತೀಚಿಗೆ ಡಿಜಿಟಲೀಕರಣ ಗೊಂಡಿರುವ ಭಾಷೆ ಕಲಿಕೆಯ ವಿಧಾನಗಳನ್ನು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ಮುಖಾಂತರ ಚರ್ಚಿಸಲು ಕ್ರಮಕ್ಕೆಗೊಳ್ಳುವುದು. ಇದರಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ತರಗತಿಯಲ್ಲಿ ಹೆಚ್ಚು ಏಕಾಗ್ರತೆಯಿಂದ ಪಾಠ ಕೇಳಲು ಮತ್ತು ಅಧ್ಯಯನದಲ್ಲಿ ತೊಡಗಲು ಅನುಕೂಲವಾಗುತ್ತದೆ.

5. ಭಾಷಾಕಲಿಕೆಯ ಪ್ರಯೋಗಾಲಯದ ಮುಖಾಂತರ ಬಹುಬೇಗ ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಕಲಿಯಲು ಅನುಕೂಲವಾಗುವಂತೆ ಕಾರ್ಯಚಟುವಟಿಕೆಗಳನ್ನು ಮತ್ತು ಕ್ರಿಯಾ ಯೋಜನೆಗಳನ್ನು ರೂಪಿಸುವುದು.

Module - 1   (03 hours of pedagogy)

1. Introduction, Necessity of learning a local language. Methods to learn the Kannada language.

2. Easy learning of a Kannada Language: A few tips. Hints for correct and polite conservation, Listening and Speaking Activities, Key to Transcription

3. ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ಮಾರ್ಥಕ ಪದಗಳು - Personal Pronouns, Possessive Forms, Interrogative words

Module - 2
<div align="right">(03 hours of pedagogy)</div>

1. **ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು - Possessive forms of nouns, dubitive question and Relative nouns**
2. **ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and Colour Adjectives, Numerals**

3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು –ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ – (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) –**Predictive Forms, Locative Case**

Module - 3
<div align="right">(03 hours of pedagogy)</div>

1. ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು - **Dative Cases, and Numerals**
2. ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು -**Ordinal numerals and Plural markers**
3. ನ್ಯೂನ/ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು & ವರ್ಣ ಗುಣವಾಚಕಗಳು –**Defective/Negative Verbs & Colour Adjectives**

Module- 4
<div align="right">(03 hours of pedagogy)</div>

1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು
   Permission, Commands, encouraging and Urging words (Imperative words and sentences)
2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು
   Accusative Cases and Potential Forms used in General Communication

3. "ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು -
   Helping Verbs "iru and iralla", Corresponding Future and Negation Verbs
4. ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ, ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ-
   Comparitive, Relationship, Identification and Negation Words

Module - 5
<div align="right">(03 hours of pedagogy)</div>

1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು -Different types of Tense, Time and Verbs
2. ದ್, -ತ್, - ತು, - ಇತು, - ಆಗಿ, - ಅಲ್ಲ, - ಗ್, -ಕ್, ಇದೆ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ - Formation of Past, Future and Present Tense Sentences with Verb Forms

3. **Kannada Vocabulary List :**ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು -**Kannada Words in Conversation**

Course outcome (Course Skill Set) ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ / ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ
ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಾಂಶಗಳು:
At the end of the course the student will be able to:

CO1	To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
CO2	To enable learners to Listen and understand the Kannada language properly.
CO3	To speak, read and write Kannada language as per requirement.
CO4	To train the learners for correct and polite conservation.
CO5	To know about Karnataka state and its language, literature and General information about this state.

University Prescribed Textbook :

<div align="center">

ಬಳಕೆ ಕನ್ನಡ

ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ

ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

</div>

ಸೂಚನೆ :

ವಿಶೇಷ ಸೂಚನೆ : 1. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮಕ್ಕೆ ಸೀಮಿತವಾಗಿ ಅಂತಿಮ ಪರೀಕ್ಷೆಯ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ ಇರುತ್ತದೆ.

           2. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮವನ್ನು ಹೊರತುಪಡಿಸಿದ ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿನ ಉಳಿದ ಭಾಗಗಳನ್ನು ಹೆಚ್ಚುವರಿ ಪೂರಕ ಓದಿಗಾಗಿ ಬಳಸಿಕೊಳ್ಳಬಹುದು. ಅಂತಿಮ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಈ ಪಾಠಗಳಿಂದ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲಾಗುವುದಿಲ್ಲ.

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           3. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.

           4. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions.
- ✓ Seminars and assignments.

COs and POs Mapping (Samskritika Kannada/ Balake Kannada):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						3				1		
CO2						3				1		
CO3						3				1		
CO4						3				1		
CO5						3				1		

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

INNOVATION and DESIGN THINKING			
Course Code	**21IDT18**	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	1:0:0	SEE Marks	50
Total Hours of Pedagogy	25	Total Marks	100
Credits	01	Exam Hour:	01

Course Category: Foundation
Preamble: This course provides an introduction to the basic concepts and techniques of engineering and reverses engineering, the process of design, analytical thinking and ideas, basics and development of engineering drawing, application of engineering drawing with computer aide.
Course objectives:
- To explain the concept of design thinking for product and service development
- To explain the fundamental concept of innovation and design thinking
- To discuss the methods of implementing design thinking in the real world.

Teaching-Learning Process (General Instructions)

These are sample Strategies; which teachers can use to accelerate the attainment of the various course outcomes.

1. Lecturer method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain concepts
3. Encourage collaborative (Group Learning) Learning in the class
4. Ask at least three HOTS (Higher-order Thinking) questions in the class, which promotes critical thinking
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develops thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.
6. Topics will be introduced in multiple representations.
7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

Module-1
PROCESS OF DESIGN **Understanding Design thinking** Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping

Teaching-Learning Process	Introduction about the design thinking: Chalk and Talk method
	Theory and practice through presentation
	MVP and Prototyping through live examples and videos

Module-2
Tools for Design Thinking Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design

Teaching-Learning	Case studies on design thinking for real-time interaction and analysis

| Process | Simulation exercises for collaborated enabled design thinking |
| | Live examples on the success of collaborated design thinking |

Module-3

Design Thinking in IT

Design Thinking to Business Process modelling – Agile in Virtual collaboration environment – Scenario based Prototyping

Teaching-Learning Process	Case studies on design thinking and business acceptance of the design
	Simulation on the role of virtual eco-system for collaborated prototyping

Module-4

DT For strategic innovations

Growth – Story telling representation – Strategic Foresight - Change – Sense Making - Maintenance Relevance – Value redefinition - Extreme Competition – experience design - Standardization – Humanization - Creative Culture – Rapid prototyping, Strategy and Organization – Business Model design.

Teaching-Learning Process	Business model examples of successful designs
	Presentation by the students on the success of design
	Live project on design thinking in a group of 4 students

Module-5

Design thinking workshop

Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test

Teaching-Learning Process	8 hours design thinking workshop from the expect and then presentation by the students on the learning from the workshop

Course Outcomes:

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

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Appreciate various design process procedure	K2
CO2	Generate and develop design ideas through different technique	K2
CO3	Identify the significance of reverse Engineering toUnderstand products	K2
CO4	Draw technical drawing for design ideas	K3

Suggested Learning Resources:

Text Books :
1. John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design",Cengage learning (International edition) Second Edition, 2013.
2. Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press , 2009.
3. Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
4. Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

References:

5. Yousef Haik and Tamer M.Shahin, "Engineering Design Process", CengageLearning, Second Edition, 2011.
6. Book - Solving Problems with Design Thinking - Ten Stories of What Works (Columbia Business School Publishing) Hardcover – 20 Sep 2013 by Jeanne Liedtka (Author), Andrew King (Author), Kevin Bennett (Author).

Web links and Video Lectures (e-Resources):

1. www.tutor2u.net/business/presentations/. /**productlifecycle**/default.html
2. https://docs.oracle.com/cd/E11108_02/otn/pdf/. /E11087_01.pdf
3. www.bizfilings.com › Home › Marketing › Product Developmen
4. https://www.mindtools.com/brainstm.html
5. https://www.quicksprout.com/. /how-to-**reverse**-**engineer**-your-competit
6. www.vertabelo.com/blog/documentation/**reverse**-**engineering**
   https://support.microsoft.com/en-us/kb/273814
7. https://support.google.com/docs/answer/179740?hl=en
8. https://www.youtube.com/watch?v=2mjSDIBaUlM
   thevirtualinstructor.com/foreshortening.html
   https://dschool.stanford.edu/.../designresources/.../ModeGuideBOOTCAMP2010L.pdf
   https://dschool.stanford.edu/use-our-methods/ 6. https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process 7. http://www.creativityatwork.com/design-thinking-strategy-for-innovation/ 49 8. https://www.nngroup.com/articles/design-thinking/ 9. https://designthinkingforeducators.com/design-thinking/ 10. www.designthinkingformobility.org/wp-content/.../10/NapkinPitch_Worksheet.pdf

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- http://dschool.stanford.edu/dgift/

https://onlinecourses.nptel.ac.in/noc19_mg60/preview

COs and POs Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			1									
CO2			1		1							
CO3			1			1						
CO4			1								1	

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

II Semester

22MATE21 Mathematics-2 for Electrical & Electronic Stream   (2-2-2)4

Contact Hours:40 Theory + 12 Lab Sessions

Course Objectives: The goal of the course Mathematics-II for Electrical & Electronics Engineering Stream (22MATE21) is to
- ➢ Develop the knowledge of solving electronics and electrical engineering problems numerically.
- ➢ Familiarize the importance of Integral calculus and Vector calculus essential for electronics and electrical engineering.
- ➢ Analyse Electronics and Electrical Engineering problems by applying Partial Differential Equations.

Course outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level(3)	**Moderate Level(2)**	**Slight Level(1)**
CO1	Apply the knowledge of numerical methods in solving physical and engineering phenomena.			1,2,12
CO2	To understand the concept of Laplace transform and to solve initial value problems.			1,2,12
CO3	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, line Integral and surface integral.			1,2,12
CO4	Demonstrate the idea of Linear dependence and independence of sets in the vector space, And linear transformation			1,2,12
CO5	Get familiarize with modern mathematical tools namely SCILAB/**PYTHON**/MATLAB			1,2,12

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	1	1										1

Module-1 (Numerical methods -1) (8 hours)

Importance of numerical methods for discrete data in the field of EC&EE Engineering Applications.

Solution of algebraic and transcendental equations: Regula-Falsi method and Newton-Raphson method (only formulae). Problems. Finite differences, Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation formula (All formulae without proof). Problems.

Numerical integration: Trapezoidal, Simpson's $(1/3)^{rd}$ and $(3/8)^{th}$ rules (without proof). Problems.
Self-Study: Bisection method, Lagrange's inverse Interpolation, Weddle's rule.
Applications: Estimating the approximate roots, extremum values, Area, volume, and surface area.

Module-2 (Numerical Methods -2) (8 hours)

Introduction to various numerical techniques for handling EC& EE Applications. Numerical Solution of Ordinary Differential Equations (ODEs):

Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor- corrector formula (No derivations of formulae). Problems.
Self-Study: Adam-Bashforth method.
Applications: Estimating the approximate solutions of ODE for electric circuits.

Module-3 (Laplace Transform) (8 hours)

Importance of Laplace Transform for EC &EE Engineering Applications.

Existence and Uniqueness of Laplace transform (LT), transform of elementary functions, region of convergence, Properties–Linearity, Scaling, t-shift property, s-domain shift, differentiation in the s-domain, division by t, differentiation and integration in the time domain, LT of special functions- periodic functions(square wave, saw-tooth wave, triangular wave, full & half wave rectifier), Heaviside Module step function, Module impulse function.

Inverse Laplace Transforms:

Definition, properties, evaluation using different methods, convolution theorem (without proof), problems, and Applications to solve ordinary differential equations.
Self-Study: Verification of convolution theorem.
Applications: Signals and systems, Control systems, LR, CR & LCR circuits.

Module-4 (Vector Calculus) (8 hours)

Introduction to Vector Calculus in EC&EE Engineering Applications.

Vector Differentiation: Scalar and vector fields. Gradient, directional derivative, curl and divergence-physical interpretation, solenoidal and irrotational vector fields. Problems.

Vector Integration: Line integrals, Surface integrals. Applications to work done by a force and flux. Statement of Green's theorem and Stoke's theorem. Problems.
Self-Study: Volume integral and Gauss divergence theorem.

Applications: Conservation of laws, Electrostatics, Analysis of stream lines and electric potentials.

Module-5 (Vector Space and Linear Transformations) (8 hours)
Importance of Vector Space and Linear Transformations in the field of EC&EE Engineering Applications.
Vector spaces: Definition and examples, subspace, linear span, Linearly independent and dependent sets, Basis and dimension.
Linear Transformations: Definition and examples, Algebra of transformations, Matrix of a linear transformation. Change of coordinates, Rank and nullity of a linear operator, Rank-Nullity theorem. Inner product spaces and orthogonality.
Self-study: Angles and Projections. Rotation, reflection, contraction and expansion.
Applications: Image processing, AI & ML, Graphs and networks, computer graphics.

List of Laboratory experiments (2hours/week per batch/batchstrength15) 10 labsessions + 1repetitionclass + 1LabAssessment
1. Solution of algebraic and transcendental equations by Regula-Falsi and Newton-Raphson method.
2. Interpolation/Extrapolation using Newton's forward and backward difference formula.
3. Computation of area under the curve using Trapezoidal, Simpson's(1/3)rd and (3/8)th rule
4. Solution of ODE of first order and first degree by Taylor's series and Modified Euler's method.
5. Solution of ODE of first order and first degree by Runge-Kutta 4th order
   a. and Milne's predictor-corrector method.
6. Computing inverse Laplace transform of standard functions.
7. Laplace transform of convolution of two functions.
8. Finding gradient, divergent, curl and their geometrical interpretation. Verification of Green's theorem.
9. Computation of basic and dimension for a vector space and Graphical representation of linear transformation.
10. Visualization in time and frequency domain of standard functions.

Text Books
1. **B. S. Grewal**: "Higher Engineering Mathematics", Khanna publishers , 44th Ed., 2021.
2. **E. Kreyszig**: "Advanced Engineering Mathematics", John Wiley & Sons, 10th Ed., 2018.

Reference Books
1. **V. Ramana:** "Higher Engineering Mathematics" McGraw-HillEducation,11th Ed.,2017
2. **Srimanta Pal & SubodhC. Bhunia**: "Engineering Mathematics" Oxford University press, 3rd Ed, 2016

3. **N.P Bali and Manish Goyal**:"Atext book of Engineering Mathematics" Laxmi Publications, 10th Ed., 2022.
4. **C. Ray Wylie, Louis C. Barrett:** "Advanced Engineering Mathematics" McGraw–Hill Book Co., New york, 6th Ed., 2017.
5. **Gupta C.B, SingS. Rand Mukesh Kumar:** "Engineering Mathematic for Semester I and II", Mc- Graw Hill Education (India) Pvt. Ltd 2015.
6. **H.K.Dass and Er.Rajnish Verma:** "Higher Engineering Mathematics"S. Chand Publication, 3rd Ed., 2014.
7. **James Stewart: "**Calculus" Cengage Publications, 7th Ed., 2019.
8. **David C Lay:** "Linear Algebra and its Applications", Pearson Publishers, 4th Ed.,2018.
9. **Gareth Williams:** "Linear Algebra with applications", Jones Bartlett Publishers Inc.,6th Ed.,2017.

Web links and Video Lectures (e-Resources):
- http://nptel.ac.in/courses.php?disciplineID=111
- http://www.class-central.com/subject/math(MOOCs)
- http://academicearth.org/
- VTU e-Shikshana Program
- VTU EDUSAT Program

Electrical & Electronics Engineering and Allied branches (Chemistry group)

Course Title:	Chemistry for Electrical and Electronics Engineering stream		
Course Code:	**22CHEE22**	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)[1]	2:2:2:0	Exam Hours	03+02
Total Hours of Pedagogy	40 hours Theory + 10 to12 Lab slots	Credits	04

Course objectives

- To enable students to acquire knowledge on principles of chemistry for engineering applications.
- To develop an intuitive understanding of chemistry by emphasizing the related branches of engineering.
- To provide students with a solid foundation in analytical reasoning required to solve societal problems.

Teaching-Learning Process

These are samplestrategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching–Learning more effective

- Tutorial & remedial classes for needy students (not regular T/R)
- Conducting Makeup classes / Bridge courses for needy students
- Demonstration of concepts either by building models or by industry visit
- Experiments in laboratories shall be executed in blended mode (conventional or non–conventional methods)
- Use of ICT – Online videos, online courses
- Use of online platforms for assignments / Notes / Quizzes (Ex. Google classroom)

MODULE 5: Sensors in Analytical Techniques (8hr)

Electrode System: Introduction, types of electrodes. Ion selective electrode – definition, construction, working and applications of glass electrode. Determination of pH using glass electrode. Reference electrode - Introduction, calomel electrode – construction, working and applications of calomel electrode. Concentration cell – Definition, construction and Numerical problems.

Sensors: Introduction, working principle and applications of Conductometric sensors, Electrochemical sensors, Thermometric sensors, and Optical sensors.

Analytical Techniques: Introduction, principle and instrumentation of Colorimetric sensors; its application in the estimation of copper, Potentiometric sensors; its application in the estimation of iron, Conductometric sensors; its application in the estimation of weak acid.

Self-learning: IR and UV- Visible spectroscopy.

MODULE 2: Energy Conversion and Storage (8hr)

Batteries: Introduction, classification of batteries. Components, construction, working and applications of modern batteries; Na-ion battery, solid state battery (Li-polymer battery) and flow battery (Vanadium redox flow battery).

Fuel Cells: Introduction, construction, working and applications of methanol–oxygen and

polymer electrolyte membrane (PEM) fuel cell.

Solar Energy: Introduction, importance of solar PV cell, construction and working of solar PV cell, advantages and disadvantages.

Self-learning: Li-ion battery, H_2-O_2 fuel cell

MODULE 3: Corrosion Science and E-waste Management (8hr)

Corrosion Chemistry: Introduction, electrochemical theory of corrosion, types of corrosion-differential metal and differential aeration. Corrosion control - galvanization, anodization and sacrificial anode method. Corrosion Penetration Rate (CPR) - Introduction and numerical problem.

E-waste Management: Introduction, sources, types, effects of e-waste on environment and human health, methods of disposal, advantages of recycling. Extraction of copper and gold from e-waste.

Self-learning: Recycling of PCB and battery components

MODULE 4: Nanomaterials and Display Systems (8hr)

Nanomaterials: Introduction, size dependent properties of nanomaterials (Surface area, Catalytic, Conducting), preparation of nanomaterials by sol-gel and co-precipitation method with example. Introduction, properties and applications - Nanofibers, Nanophotonics, Nanosensors.

Display Systems: Liquid crystals (LC's) - Introduction, classification, properties and application in Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light emitting diodes (QLED's).

Perovskite Materials: Introduction, properties and applications in optoelectronic devices.

Self-learning: Properties & electrochemical applications of carbon nanotubes and graphene.

MODULE 1: Chemistry of Electronic Materials (8hr)

Conductors and Insulators: Introduction, principle with examples.

Semiconductors: Introduction, production of electronic grade silicon-Czochralski process (CZ) and Float Zone (FZ) methods.

Polymers: Introduction, Molecular weight - Number average, Weight average and numerical problems. Conducting polymers – synthesis and conducting mechanism of polyacetylene. Preparation, properties and commercial applications of graphene oxide.

PCB: Electroless plating – Introduction, Electroless plating of copper in the manufacture of double-sided PCB.

Self-learning: Technological importance of metal finishing and distinction between electroplating and electroless plating.

PRACTICAL MODULE

A – Demonstration (any two) offline/virtual:

A1. Synthesis of polyurethane

A2. Determination of strength of an acid in Pb-acid battery

A3. Synthesis of iron oxide nanoparticles

A4. Electroplating of copper on metallic objects

B – Exercise (compulsorily any 4 to be conducted):

B1.Conductometric estimation of acid mixture

B2. Potentiometric estimation of FAS using $K_2Cr_2O_7$

B3. Determination of pKa of vinegar using pH sensor (Glass electrode)

B4. Determination of rate of corrosion of mild steel by weight loss method

B5.Estimation of total hardness of water by EDTA method

C – Structured Enquiry (compulsorily any 4 to be conducted):

C1. Estimation of Copper present in electroplating effluent by optical sensor (colorimetry)

C2. Determination of Viscosity coefficient of lubricant (Ostwald's viscometer)

C3. Estimation of iron in TMT bar by diphenyl amine/external indicator method

C4. Estimation of Sodium present in soil/effluent sample using flame photometry

C5. Determination of Chemical Oxygen Demand(COD) of industrial waste water sample

D – Open Ended Experiments (any two):

D1. Estimation of metal in e-waste by optical sensors

D2. Electroless plating of Nickle on Copper

D3. Determination of glucose by electrochemical sensors

D4. Synthesis of polyaniline and its conductivity measurement

Course outcome (Course Skill Set)
At the end of the course the student will be able to:

CO1.	Identify the terms and processes involved in scientific and engineering applications
CO2.	Explain the phenomena of chemistry to describe the methods of engineering processes
CO3.	Solve for the problems in chemistry that are pertinent in engineering applications
CO4.	Apply the basic concepts of chemistry to explain the chemical properties and processes
CO5.	Analyze properties and processes associated with chemical substances in multidisciplinary situations

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation(CIE):

Two Unit Tests each of20 Marks (duration 01 hour)

• First test after the completion of 30-40 % of the syllabus
• Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration.

Two assignments each of 10 Marks

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/Hands-on practice (experiments)/Group Discussions/others. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common/repeated for any of the methods of the CIE. Each method of CIE should have a different

syllabus portion of the course). CIE methods/test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

The sum of two tests, two assignments, will be out of 60 marks and will be scaled down to 30 marks

CIE for the practical component of the Integrated Course

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and **scaled down to 15 marks**.
- The laboratory test **(duration 02/03 hours)** at the end of the 14th /15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and **scaled down to 05 marks.**
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **20 marks**.

Semester End Examination(SEE):

- Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours)**
- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

Suggested Learning Resources:

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Wiley Engineering Chemistry, Wiley India Pvt. Ltd. New Delhi, 2013- 2nd Edition.
2. Engineering Chemistry, Satyaprakash& Manisha Agrawal, Khanna Book Publishing, Delhi
3. A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.
4. Essentials of Physical Chemistry, Bahl&Tuli, S.Chand Publishing
5. Applied Chemistry, Sunita Rattan, Kataria 5. Engineering Chemistry, Baskar, Wiley
6. Engineering Chemistry – I, D. GrourKrishana, Vikas Publishing
7. A Text book of Engineering Chemistry, SS Dara & Dr. SS Umare, S Chand & Company Ltd., 12thEdition, 2011.
8. A Text Book of Engineering Chemistry, R.V. Gadag and Nityananda Shetty, I. K. International Publishing house. 2nd Edition, 2016.
9. Text Book of Polymer Science, F.W. Billmeyer, John Wiley & Sons, 4th Edition, 1999.
10. Nanotechnology A Chemical Approach to Nanomaterials, G.A. Ozin& A.C. Arsenault, RSC Publishing, 2005.
11. Corrosion Engineering, M. G. Fontana, N. D. Greene, McGraw Hill Publications, New York, 3rd Edition, 1996.
12. Linden's Handbook of Batteries, Kirby W. Beard, Fifth Edition, McGraw Hill, 2019.
13. OLED Display Fundamentals and Applications, TakatoshiTsujimura, Wiley–Blackwell , 2012
14. Supercapacitors: Materials, Systems, and Applications, Max Lu, Francois Beguin, ElzbietaFrackowiak, Wiley-VCH; 1st edition, 2013.
15. "Handbook on Electroplating with Manufacture of Electrochemicals", ASIA PACIFIC BUSINESS PRESS Inc., 2017. Dr. H. Panda,
16. Expanding the Vision of Sensor Materials. National Research Council 1995, Washington, DC: The

National Academies Press. doi: 10.17226/4782.

17. Engineering Chemistry, Edited by Dr. Mahesh B and Dr. Roopashree B, Sunstar Publisher, Bengaluru, ISBN 978-93-85155-70-3, 2022

18. High Performance Metallic Materials for Cost Sensitive Applications, F. H. Froes, et al. John Wiley & Sons, 2010

19. Instrumental Methods of Analysis, Dr. K. R. Mahadik and Dr. L. Sathiyanarayanan, NiraliPrakashan, 2020

20. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch Seventh Edition, Cengage Learning, 2020

21. Polymer Science, V R Gowariker, N V Viswanathan, Jayadev, Sreedhar, Newage Int. Publishers, 4th Edition, 2021

22. Engineering Chemistry, P C Jain & Monica Jain, Dhanpat Rai Publication, 2015-16th Edition.

23. Nanostructured materials and nanotechnology, Hari Singh, Nalwa, academic press, 1st Edition, 2002.

24. Nanotechnology Principles and Practices, Sulabha K Kulkarni, Capital Publishing Company, 3rd Edition 2014

25. Principles of nanotechnology, Phanikumar, Scitech publications, 2nd Edition, 2010.

26. Chemistry for Engineering Students, B. S. Jai Prakash, R. Venugopal, Sivakumaraiah& Pushpa Iyengar., Subash Publications, 5th Edition, 2014

27. "Engineering Chemistry", O. G. Palanna, Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint, 2015.

28. Chemistry of Engineering materials, Malini S, K S Anantha Raju, CBS publishers Pvt Ltd.,

29. Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

Web links and Video Lectures (e-Resources):

- http://libgen.rs/
- https://nptel.ac.in/downloads/122101001/
- https://nptel.ac.in/courses/104/103/104103019/
- https://ndl.iitkgp.ac.in/
- https://www.youtube.com/watch?v=faESCxAWR9k
- https://www.youtube.com/watch?v=TBqXMWaxZYM&list=PLyhmwFtznRhuz8L1bb3X-9IbHrDMjHWWh
- https://www.youtube.com/watch?v=j5Hml6KN4TI
- https://www.youtube.com/watch?v=X9GHBdyYcyo
- https://www.youtube.com/watch?v=1xWBPZnEJk8
- https://www.youtube.com/watch?v=wRAo-M8xBHM

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- https://www.vlab.co.in/broad-area-chemical-sciences
- https://demonstrations.wolfram.com/topics.php
- https://interestingengineering.com/science

COs and POs Mapping (Individual teacher has to fill up)											
PO											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1				1					
CO2	3	1	1				1					
CO3	3	1	1				1					
CO4	3	1	1				1					
CO5	3	1	1				1					

Course Title:		Computer Aided Engineering Drawing		
Course Code	**22CAED23**	CIE Marks	50	
Teaching Hour/Week (L:T:P:S)	2:0:2:0	SEE Marks	50	
Total Hours of Teaching - Learning	40	Total Marks	100	
Credits	03	Exam Hours	03	

Course Learning Objectives:

> **CLO1:** To understand the basic principles and conventions of engineering drawing
> **CLO2:** To use drawing as a communication mode
> **CLO3:** To generate pictorial views using CAD software
> **CLO4:** To understand the development of surfaces
> **CLO5:** To visualize engineering components

Teaching-Learning (General Instructions):

- Students should be made aware of powerful engineering communication tool – Drawing.
- Simple Case studies can be suitably selected by the teacher for hands on practice to induce the feel of fruitfulness of learning.
- Appropriate Models, Power Point presentation, Charts, Videos, shall be used to enhance visualization before hands on practice.
- For application problems use very generally available actual objects. (Example: For rectangular prism / object; matchbox, carton boxes, book, etc can be used. Similarly for other shapes)
- Use any CAD software for generating orthographic and pictorial views.
- Make use of sketch book with graph sheets for manual / preparatory sketching

Module-1

Introduction: *for CIE only*

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes HP, VP, RPP & LPP of 2D/3D environment. Selection of drawing sheet size and scale. Commands and creation of Lines, coordinate points, axes, polylines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet and curves.

Orthographic Projections of Points, Lines and Planes:

Introduction to Orthographic projections: Orthographic projections of points in 1st and 3rd quadrants.

Orthographic projections of lines (Placed in First quadrant only).

Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon, and circular laminae (Placed in First quadrant only using change of position method).

Application on projections of Lines & Planes (For CIE only)

Module-2

Orthographic Projection of Solids:

Orthographic projection of right regular solids (**Solids Resting on HP only**): Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes &Tetrahedron.

Projections of Frustum of cone and pyramids (For practice only, not for CIE and SEE).

Module-3

Isometric Projections:

Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones and spheres. Isometric projection of combination of two simple solids.

Conversion of simple isometric drawings into orthographic views.

Problems on applications of Isometric projections of simple objects / engineering components.

Introduction to drawing views using 3D environment (For CIE only).

Module-4

Development of Lateral Surfaces of Solids:

Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones resting with base on HP only. Development of lateral surfaces of their frustums and truncations.

Problems on applications of development of lateral surfaces like funnels and trays.

Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct (For CIE Only)

Module-5

Multidisciplinary Applications & Practice *(For CIE Only):*

Free hand Sketching; True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc

Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains, Ratchets, two-wheeler cart & Four-wheeler carts to dimensions etc

Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic power distribution system using suitable software

Basic Building Drawing; Like, Architectural floor plan, basic foundation drawing, steel structures- Frames, bridges, trusses using Auto CAD or suitable software,

Electronics Engineering Drawings- Like, Simple Electronics Circuit Drawings, practice on layers concept.

Graphs & Charts: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.

Course Outcomes

At the end of the course the student will be able to:

    CO 1. Draw and communicate the objects with definite shape and dimensions

    CO 2. Recognize and Draw the shape and size of objects through different views

    CO 3. Develop the lateral surfaces of the object

    CO 4. Create a Drawing views using CAD software.

    CO 5. Identify the interdisciplinary engineering components or systems through its graphical representation.

Suggested Learning Resources:

Text Books

- *S.N. Lal, & T Madhusudhan*:, Engineering Visulisation, 1st Edition, Cengage, Publication
- *Parthasarathy N. S., Vela Murali*, Engineering Drawing, Oxford University Press, 2015.

Reference Books

- *Bhattacharya S. K.*, Electrical Engineering Drawing, New Age International publishers, second edition 1998, reprint 2005.
- *Chris Schroder*, Printed Circuit Board Design using AutoCAD, Newnes, 1997.
- *K S Sai Ram* Design of steel structures, , Third Edition by Pearson
- *Nainan p kurian* Design of foundation systems, Narosa publications
- *A S Pabla*, Electrical power distribution, 6th edition, Tata Mcgraw hill
- *Bhatt, N.D., Engineering Drawing: Plane and Solid Geometry*, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.
- *K. R. Gopalakrishna, & Sudhir Gopalakrishna*: Textbook Of Computer Aided Engineering Drawing, 39th Edition, Subash Stores, Bangalore, 2017

COs and POs Mapping

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2			3	1		1	1	3		2
CO2	3	2			3	1		1	1	3		2
CO3	3	2			3	1		1	1	3		2
CO4	3	3			3	1	1		1	3		1
CO5	3	2			3				1	3		2

Level 3- Highly Mapped,   Level 2-Moderately Mapped,   Level 1-Low Mapped,   Level 0- Not Mapped

Course Title:	**Introduction to Electronics Engineering**			
Course Code:		**22ESC243**	CIE Marks	50
Course Type (Theory/Practical/Integrated)		Theory	SEE Marks	50
			Total Marks	100
Teaching Hours/Week (L:T:P: S)		3:0:0:0	Exam Hours	03
Total Hours of Pedagogy		40 hours	Credits	03

Course objectives

1. To prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.

2. To equip students with a basic foundation in electronic engineering required for comprehending the operation and application of electronic circuits, logic design, embedded systems, and communication systems.

3.Professionalism & Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.

Teaching-Learning Process

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective

1. Lecturer method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.

2.Arrange visits to nearby PSUs such as BHEL, BEL, ISRO, etc., and small-scale hardware Industries to give brief information about the electronics manufacturing industry.

3. Show Video/animation films to explain the functioning of various analog and digital circuits.

4. Encourage collaborative (Group) Learning in the class

5. Ask at least three HOTS (Higher-order Thinking) questions in the class, which promotes critical thinking

6. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyze information rather than simply recall it.

7. Topics will be introduced in multiple representations.

8. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.

9. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

Module-1 (8 hours)

Power Supplies –Block diagram, Half-wave rectifier, Full-wave rectifiers and filters, Voltage regulators, Output resistance and voltage regulation, Voltage multipliers.

Amplifiers – CE amplifier with and without feedback, Multi-stage amplifier; BJT as a switch: Cut-off and saturation modes.(Text 1)

Module-2(8 hours)

Oscillators – Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, Ladder network oscillator, Wein bridge oscillator, Multivibrators, Single-stage astable oscillator, Crystal controlled oscillators (Only Concepts, working, and waveforms. No mathematical derivations)   **Operational amplifiers** - Ideal op-amp; characteristics of ideal and practical op-amp; Practical op-amp circuits: Inverting and non-inverting amplifiers, voltage follower, summer, subtractor, integrator, differentiator.(Text 1)
Module-3 (8 hours)
Boolean Algebra and Logic Circuits: Binary numbers, Number Base Conversion, octal & Hexa Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates (Text 2: 1.2, 1.3, 1.4, 1.5,2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7)   **Combinational logic**: Introduction, Design procedure, Adders- Half adder, Full adder (Text 2:4.1, 4.2, 4.3)
Module-4 (8 hours)
Embedded Systems – Definition, Embedded systems vs general computing systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC   **Sensors and Interfacing** – Instrumentation and control systems, Transducers, Sensors, Actuators, LED, 7-Segment LED Display. (Text 1)
Module-5 (8 hours)
Analog Communication Schemes – Modern communication system scheme, Information source, and input transducer, Transmitter, Channel or Medium – Hardwired and Soft wired, Noise, Receiver, Multiplexing, Types of communication systems. Types of modulation (only concepts) – AM , FM, Concept of Radio wave propagation (Ground, space, sky)   **Digital Modulation Schemes**: Advantages of digital communication over analog communication, ASK, FSK, PSK, Radio signal transmission Multiple access techniques. (Text 3)

Suggested Learning Resources:

Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1.Mike Tooley, 'Electronic Circuits, Fundamentals & Applications',4 thEdition, Elsevier, 2015.
DOI https://doi.org/10.4324/9781315737980. eBook ISBN9781315737980
2nd
2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-84.
3.D P Kothari, I J Nagrath, 'Basic Electronics', 2nd edition, McGraw Hill Education (India),Private Limited, 2018.

Course Outcomes

At the end of the course the student will be able to:

CO1	Develop the basic knowledge on construction and operation of rectifiers and amplifiers.
CO2	Apply the acquired knowledge to construct small scale circuits consisting of oscillators and operational amplifiers.
CO3	Develop the competence knowledge to construct basic digital circuit by making use of basic gates and its function.
CO4	Apply the acquired knowledge to construct small scale embedded circuits.
CO5	Study the conceptual blocks of basic communication system and acquire knowledge of analog & digital communication schemes.

COs and POs Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1		2									
CO2	2											
CO3	2		1									
CO4	2											1
CO5	2											1

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

Course Title:	Introduction to C++ Programming			
Course Code:	**22PLC25D**		CIE Marks	50
Course Type (Theory/Practical /Integrated)	Integrated		SEE Marks	50
			Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:0:2 :0		Exam Hours	03
Total Hours of Pedagogy	40 hours		Credits	03

Course objectives
- Understanding about object oriented programming and Gain knowledge about the capability to store information together in an object.
- Understand the capability of a class to rely upon another class and functions.
- Understand about constructors which are special type of functions.
- Create and process data in files using file I/O functions
- Use the generic programming features of C++ including Exception handling

Teaching-Learning Process
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective
1. Chalk and talk
2. Online demonstration
3. Hands on problem solving

Module-1 (8 hours)

Introduction to Object Oriented Programming: Computer programming background- C++ overview. First C++ Program -Basic C++ syntax, Object Oriented Programming: What is an object, Classes, methods and messages, abstraction and encapsulation, inheritance, abstract classes, polymorphism.

Textbook 1: Chapter 1(1.1 to 1.8)

Module-2 (8 hours)

Functions in C++: Tokens – Keywords – Identifiers and constants – Operators in C++ – Scope resolution operator – Expressions and their types – Special assignment expressions – Function prototyping – Call by reference – Return by reference – Inline functions -Default arguments – Function overloading. Friend functions.

Textbook 2: Chapter 3(3.2,3.3,3.4,3.13,3.14,3.19, 3.20) , chapter 4(4.3,4.4,4.5,4.6,4.7,4.9)

Module-3 (8 hours)

Inheritance & Polymorphism: Derived class Constructors, destructors-Types of Inheritance-Defining Derived classes, Single Inheritance, Multiple, Hierarchical Inheritance, Hybrid Inheritance.
Polymorphism:
Static polymorphism: Function overloading, Operator Overloading
Dynamic polymorphism: Method overriding

Textbook 2: Chapter 6 (6.2,6.11) chapter 8 (8.1 to,8.8)

Module-4 (8 hours)

I/O Streams: C++ Class Hierarchy- File Stream-Text File Handling- Binary File Handling during file operations.

Textbook 1: Chapter 12(12.5) , Chapter 13 (13.6,13.7)

Module-5 (8 hours)
Exception Handling: Introduction to Exception - Benefits of Exception handling- Try and catch block Throw statement- Pre-defined exceptions in C++ **Textbook 2: Chapter 13 (13.2 to13.6)**

Course outcome (Course Skill Set)

At the end of the course the student will be able to:

CO1	Able to understand and design the solution to a problem using object-oriented programming concepts.
CO2	Able to reuse the code with extensible Class types, User-defined operators and function Overloading.
CO3	Achieve code reusability and extensibility by means of Inheritance and Polymorphism
CO4	Implement the features of C++ including templates, exceptions and file handling for providing programmed solutions to complex problems.

Programming Assignments:

1. Write a C++ program to sort the elements in ascending and descending order.
2. Write a C++ program to find the sum of all the natural numbers from 1 to n.

3. Write a C++ program to swap 2 values by writing a function that uses call by reference technique.

4. Write a C++ program to demonstrate function overloading for the following prototypes.

add(int a, int b)
add(double a, double b)

5. Create a class named Shape with a function that prints "This is a shape". Create another class named Polygon inheriting the Shape class with the same function that prints "Polygon is a shape". Create two other classes named Rectangle and Triangle having the same function which prints "Rectangle is a polygon" and "Triangle is a polygon" respectively. Again, make another class named Square having the same function which prints "Square is a rectangle" .Now, try calling the function by the object of each of these classes.

6.Suppose we have three classes Vehicle, FourWheeler, and Car. The class Vehicle is the base class, the class FourWheeler is derived from it and the class Car is derived from the class FourWheeler. Class Vehicle has a method 'vehicle' that prints 'I am a vehicle', class FourWheeler has a method 'fourWheeler' that prints 'I have four wheels', and class Car has a method 'car' that prints 'I am a car'. So, as this is a multi-level inheritance; we can have access to all the other classes methods from the object of the class Car. We invoke all the methods from a Car object and print the corresponding outputs of the methods.
So, if we invoke the methods in this order, car(), fourWheeler(), and vehicle(), then the output will be

I am a car

I have four wheels

I am a vehicle

Write a C++ program to demonstrate multilevel inheritance using this.

7. Write a C++ program to create a text file, check file created or not, if created it will write some text into the file and then read the text from the file.

8.Write aC++ program to write and read time in/from binary file using fstream

9. Write a function which throws a division by zero exception and catch it in catch block. Write a C++ program to demonstrate usage of try, catch and throw to handle exception.

10. Write a C++ program function which handles array of bounds exception using C++.

Suggested Learning Resources:
Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)
Textbooks
1. Bhushan Trivedi, "Programming with ANSI C++", Oxford Press, Second Edition, 2012.
2. Balagurusamy E, Object Oriented Programming with C++, Tata McGraw Hill Education Pvt.Ltd , Fourth Edition 2010.

Web links and Video Lectures (e-Resources):

Weblinks and Video Lectures (e-Resources):
1. Basics of C++ - https://www.youtube.com/watch?v=BClS40yzssA
2. Functions of C++ - https://www.youtube.com/watch?v=p8ehAjZWjPw

Tutorial Link:
1. https://www.w3schools.com/cpp/cpp_intro.asp
2. https://www.edx.org/course/introduction-to-c-3

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning
- Assign small tasks to Develop and demonstrate using C++

COs and POs Mapping (Individual teacher has to fill up)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2		2							1
CO2	3	3	2		2							1
CO3	3	3	2		2							1
CO4	3	3	2	3	2							1

Level 3- Highly Mapped,   Level 2-Moderately Mapped,   Level 1-Low Mapped,   Level 0- Not Mapped

22PWS26	Professional Writing Skills in English	(1-0-0) 1

Contact Hours: 13	CIE: 50 Marks	SEE: 50 Marks.	Exam Duration 01 hour

Course Learning Objectives (CLOs): This course focuses on the following learning perspectives:

- To Identify the Common Errors in Writing and Speaking of English.
- To achieve better Technical writing and Presentation skills for employment.
- To read Technical proposals properly and make them to write good technical reports.
- To acquire Employment and Workplace communication skills.
- To learn about Techniques of Information Transfer through presentation in different level.

Course Outcomes (COs):

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12) / PSOs (1-3)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Identify** the Common Errors in Writing and Speaking.		10	
CO-2	**Achieve** better Technical writing and Presentation skills.		10	
CO-3	**Read** Technical proposals properly and Write standard technical reports.	10		
CO-4	**Acquire** Employment and Workplace communication skills.		10	
CO-5	**Learn** Effective Presentation Skills	10		

POs/PSOs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mapping Level										2.4						

Pre-requisites: None

Course Contents:

Module-I (2 hours)

Identifying Common Errors in Written and Spoken English: Verb Phrase and phrasal verbs, Auxiliary verbs and their forms, Subject Verb Agreement (Concord Rules), Common errors in Subject-verb agreement, Words Confused / Misused, errors identification.   **2 Hrs**

Module-II (2 hours)

Nature and Style of sensible writing: Punctuation marks, Paragraph Writing, Writing Articles, Precise writing and Techniques in Essay writing, Sentence arrangements and Corrections activities. Misplaced modifiers, Contractions, Collocations, Correction of Errors.   **2 Hrs**

Module-III (3 hours)

Technical Reading and Writing Practices: Technical writing process, Introduction to Technical Reports writing, Significance of Reports, Types of Reports. Introduction to Technical Proposals Writing, Types of Technical Proposals, Characteristics of Technical Proposals. Scientific Writing Process. Grammar – Voices and Reported Speech, Spotting Error & Sentence Improvement, Cloze Test and Theme Detection Exercises.   **3 Hrs**

Module-IV (3 hours)

Professional Communication for Employment: Listening Comprehension, Types of Listening, Listening Barriers, Improving Listening Skills. TED talks, Reading Comprehension, Tips for effective reading. Job Applications, Types of official/employment/business Letters, Resume vs. Bio Data, Profile, CV. and effective resume writing, Emails, Blog Writing and Memos.   **3 Hrs**.

Module-V (3 hours)

Professional Communication at Workplace: Agenda, Minutes of Meeting, Group Discussion and Professional Interviews, Characteristics and Strategies of a GD and PI's, Intra and Interpersonal Communication Skills at workplace, Non-Verbal Communication Skills and its importance in GD and Interview. Presentation skills and Formal Presentations by Students, Strategies of Presentation Skills.   **3 Hrs.**

Reference Books:

1. "Professional Writing Skills in English" published by Fillip Learning – Education (ILS), Bangalore – 2022.
2. "Functional English" (As per AICTE 2018 Model Curriculum) (ISBN-978-93-5350-047-4) Cengage learning India Pvt Limited [Latest Edition 2019].
3. English for Engineers by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.
4. Technical Communication by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.

5. Technical Communication – Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017.
6. High School English Grammar & Composition by Wren and Martin, S Chandh & Company Ltd – 2015.
7. Effective Technical Communication – Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private
8. Rogers, C., Farson, R. E. Active Listening. Gordon Training Inc., www.gordontraining.com/free-workplace- articles/active-listening/, Extract from 1957 article
9. Wood, Frederick. A Remedial English Grammar for Foreign Students. Macmillan Education, India, 1990.
10. Yadugiri, M A. Making Sense of English - A Textbook of Sounds, Words and Grammar, Viva Books, 2020.

Question Paper Pattern (SEE)

1. MCQ on all Modules: 50X1 = 50 marks

Question Paper Pattern (CIE: 3 Internal Assessments)

1. MCQ on covered Modules: 20X1 = 20 marks

Indian Constitution

Course Title:	**Indian Constitution**		
Course Code:	**22ICO27**	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

Course objectives :

The course **INDIAN CONSTITUTION (22ICO17 / 27)** will enable the students,

1. To know about the basic structure of Indian Constitution.
2. To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.
3. To know about our Union Government, political structure & codes, procedures.
4. To know the State Executive & Elections system of India.
5. To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.

Teaching-Learning Process

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective: Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools.

(i) Direct instructional method (Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools), (iii) Blended learning (Combination of both), (iv) Enquiry and evaluation based learning, (v) Personalized learning, (vi) Problems based learning through discussion.

(ii) Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students In theoretical applied and practical skills.

Module-1	(03 hours of pedagogy)

Indian Constitution: Necessity of the Constitution, Societies before and after the Constitution adoption. Introduction to the Indian constitution, Making of the Constitution, Role of the Constituent Assembly.

Module-2	(03 hours of pedagogy)

Salient features of India Constitution. Preamble of Indian Constitution & Key concepts of the Preamble. Fundamental Rights (FR's) and its Restriction and limitations in different Complex Situations. building.

Module-3	(03 hours of pedagogy)

Directive Principles of State Policy (DPSP's) and its present relevance in Indian society. Fundamental Duties and its Scope and significance in Nation, Union Executive : Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet.

Module-4	(03 hours of pedagogy)

Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Judicial System of India, Supreme Court of India and other Courts, Judicial Reviews and Judicial Activism.

Module-5	(03 hours of pedagogy)

State Executive and Governer, CM, State Cabinet, Legislature - VS & VP, Election Commission, Elections & Electoral Process. Amendment to Constitution, and Important Constitutional Amendments till today. Emergency Provisions.

Course outcome (Course Skill Set)

At the end of the course 22ICO17/27 the student will be able to:

CO1	Analyse the basic structure of Indian Constitution.
CO2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
CO3	know about our Union Government, political structure & codes, procedures.
CO4	Understand our State Executive & Elections system of India.
CO5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.

Suggested Learning Resources:

Textbook:

1. **"Constitution of India" (for Competitive Exams)** - Published by Naidhruva Edutech Learning Solutions, Bengaluru. – 2022.
2. **"Introduction to the Constitution of India"**, (Students Edition.) by Durga Das Basu (**DD Basu**): Prentice –Hall, 2008.

Reference Books:

1. **"Constitution of India, Professional Ethics and Human Rights"** by Shubham Singles, Charles E. Haries, and et al: published by Cengage Learning India, Latest Edition – 2019.
2. **"The Constitution of India"** by Merunandan K B: published by Merugu Publication, Second Edition, Bengaluru.
3. **"Samvidhana Odu" - for Students & Youths by Justice HN Nagamohan Dhas, Sahayana, kerekon.**
4. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, **"Engineering Ethics"**, Prentice –Hall, 2004.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- ✓ Contents related activities (Activity-based discussions)
- ✓ For active participation of students instruct the students to prepare Flowcharts and Handouts
- ✓ Organising Group wise discussions Connecting to placement activities
- ✓ Quizzes and Discussions
- ✓ Seminars and assignments

COs and POs Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						1	1	3				
CO2						1	1	3				
CO3						1	1	3				
CO4						1	1	3				
CO5						1	1	3				

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

Scientific Foundations of Health

Course Title:	Scientific Foundations of Health		
Course Code:	**22SFH28**	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

Course objectives

The course Scientific Foundations of Health (22SFH18/28) will enable the students,

1. To know about Health and wellness (and its Beliefs) & It's balance for positive mindset.
2. To Build the healthy lifestyles for good health for their better future.
3. To Create a Healthy and caring relationships to meet the requirements of good/social/positive life.
4. To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future
5. To Prevent and fight against harmful diseases for good health through positive mindset

Teaching-Learning Process

These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective:

Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools.

(i) Direct instructional method (Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools),
(iii) Blended learning (Combination of both), (iv) Enquiry and evaluation based learning,
(v) Personalized learning, (vi) Problems based learning through discussion, (vii) Following the method of expeditionary learning Tools and techniques, (viii) Use of audio visual methods.

Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students In theoretical applied and practical skills.

Module-1	(03 hours of pedagogy)

Good Health & It's balance for positive mindset: Health -Importance of Health, Influencing factors of Health, Health beliefs, Advantages of good health, Health & Behavior, Health & Society, Health & family, Health & Personality, Psychological disorders-Methods to improve good psychological health, Changing health habits for good health.

Module-2	(03 hours of pedagogy)

Building of healthy lifestyles for better future: Developing healthy diet for good health, Food & health, Nutritional guidelines for good health, Obesity & overweight disorders and its management, Eating disorders, Fitness components for health, Wellness and physical function, How to avoid exercise injuries.

Module-3	(03 hours of pedagogy)

Creation of Healthy and caring relationships : Building communication skills, Friends and friendship - Education, the value of relationship and communication skills, Relationships for Better or worsening of life, understanding of basic instincts of life (more than a biology), Changing health behaviours through social engineering.

Module-4	(03 hours of pedagogy)

Avoiding risks and harmful habits : Characteristics of health compromising behaviors, Recognizing and avoiding of addictions, How addiction develops, Types of addictions, influencing factors of addictions, Differences between addictive people and non addictive people & their behaviors. Effects of addictions Such as...,   how to recovery from addictions.

Module-5	(03 hours of pedagogy)

Preventing & fighting against diseases for good health: How to protect from different types of infections, How to reduce risks for good health, Reducing risks & coping with chronic conditions, Management of chronic illness for Quality of life, Health & Wellness of youth :a challenge for upcoming future, Measuring of health & wealth status.

Course outcome (Course Skill Set) :

At the end of the course Scientific Foundations of Health (22SFH18/28) the student will be able to:

CO1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset.
CO2	Develop the healthy lifestyles for good health for their better future.
CO3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life.
CO4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future.
CO5	Prevent and fight against harmful diseases for good health through positive mindset.

Suggested Learning Resources:

Textbook:

1. **"Scientific Foundations of Health" – Study Material Prepared by Dr. L Thimmesha, Published in VTU - University Website.**

2. **"Scientific Foundations of Health",** (ISBN-978-81-955465-6-5) published by Infinite Learning Solutions, Bangalore – 2022.

3. **Health Psychology - A Textbook,** FOURTH EDITION by Jane Ogden McGraw Hill Education (India) Private Limited - Open University Press.

Reference Books:

1. **Health Psychology** (Second edition) by Charles Abraham, Mark Conner, Fiona Jones and Daryl O'Connor – Published by Routledge 711 Third Avenue, New York, NY 10017.

2. **HEALTH PSYCHOLOGY (Ninth Edition)** by SHELLEY E. TAYLOR - University of California, Los Angeles, McGraw Hill Education (India) Private Limited - Open University Press.

3. **SWAYAM / NPTL/ MOOCS/ We blinks/ Internet sources/ YouTube videos** and other materials / notes.

4. **Scientific Foundations of Health (Health & Welness) - General Books** published for university and colleges references by popular authors and published by the reputed publisher.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

✓ Contents related activities (Activity-based discussions)

✓ For active participation of students instruct the students to prepare Flowcharts and Handouts

✓ Organising Group wise discussions Connecting to placement activities

✓ Quizzes and Discussions, Seminars and assignments

COs and POs Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									3			3
CO2									3			3
CO3									3			3
CO4									3			3
CO5									3			3

Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped