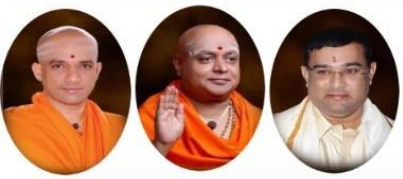

|| Jai Sri Gurudev ||
Sri Adichunchanagiri Shikshana Trust (R)

SJB Institute of Technology

An AUTONOMOUS INSTITUTION UNDER VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Approved by AICTE, 2(f) and 12(B) recognized by UGC, New Delhi
Accredited by NAAC, Accredited by NBA, Certified by ISO 9001 - 2015

B.E.

Autonomous Scheme & Syllabus

First Year -CSE, ISE, AI&ML & CSE (CS Stream)

Academic Year 2023-2024

I and II Semesters

2023-2027 Batch

SERVICE TO MANKIND IS SERVICE TO GOD

His Divine Soul Padmabhushana

Sri Sri Sri Dr. Balagangadharanath MahaSwamiji

Founder President, Sri Adichunchanagiri Shikshana Trust®

Belief in God is not ignorance or illusion. It is a belief that there is an unseen, ineffable Power that transcends all our powers of muscles, mind and lives.

His Holiness Parama Pujya

Sri Sri Sri Dr. Nirmalanandanatha MahaSwamiji

President, Sri Adichunchanagiri Shikshana Trust ®

True richness is the generosity of heart. Cultivate it and work to help the less fortunate ones in life.

Revered Sri Sri Dr. Prakashanatha Swamiji

Managing Director, BGS & SJB Group of Institutions & Hospitals

People and prosperity follow the path which the leaders take. So the elders and leaders should make sure that they give the right lead and take the right path.

Syllabus Book for CS Stream (CSE/ISE/AI&ML/CSE(DS))	
Syllabus for 1st and 2nd Semester	
The syllabus, scheme and guidelines are provided in detail. The syllabus, scheme and guidelines are subjected to changes if any needed. The updates will be done and intimated timely.	
The Syllabus book is available on	www.sjbit.edu.in
For any queries, please write to	academicdean@sjbit.edu.in

UPDATES

Release / Revision	Date	Remarks
Release	09/09/2023	Pending syllabus of 2nd SEM AEC course 23CSAE21/23EEAE21/ 23CVAE21/23MEAE21
Revision 01	02/11/2023	Updated with pending course syllabus
Revision 02	06/11/2023	More clarity in CIE & SEE guidelines of CAED course (typographical mistakes are removed) Formatting for better appearance.
Revision 03	18/11/2023	Retitling of Course titles of Mathematics, Physics, chemistry, Engg. Core courses from all departments

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AUTONOMOUS SCHEME (Tentative) UG - BE First Year for CSE/ISE/AI&ML/CSE(DS)

SCHEME: 2023 **SEM: I** **Date of Revision: 23-08-2024**

SL No	Course Type	Course type Series	Course Code	Course Title	Teaching Dept.	QP setting dept	Credits	Teaching Hrs/Week				Examinations				
								L	T	P	O	CIE Marks	SEE			Tot. Marks
								Lecture	Tutorial	Practical	PBL/ABL/ SL/othrs.		Dur.	Th. Mrks	Lab. Mrks.	
PHYSICS CYCLE																
1	BSC	1	23MAT11A	Calculus, Differential Equations & Linear Algebra	Maths	Maths	4	3	2	0		50	03	50	-	100
2	IBSC	1	23PHI12A	Physics of Applied science	PHY	PHY	4	2	2	2		50	03	50	-	100
3	ESC	1	23EET13A	Fundamentals of Electrical Engineering	EEE	EEE	3	3	0	0		50	03	50	-	100
4	ESC	2	23MET14A	Essentials of Mechanical Engineering	ME	ME	3	3	0	0		50	03	50	-	100
5	IESC	1	23CPI15A	Problem Solving using C	CSE^	CSE^	4	3	0	2		50	03	50	-	100
6	HSMC	1	23ENGH01	Professional Skills in English	HSS	HSS	PP/NP	0	1	1		50	-	0	-	50
7	HSMC	2	23ENVH02	Environmental studies	HSS	HSS	1	1	0	0	@	50	02	50	-	100
8	NCMC	1	23PDSN01	Skills for Success: An approach to aptitude and soft skills	I.E.	I.E.	PP/NP	0	0	0	2	50	-	0	-	50
9	AEC	1	23CSAE11	WEB 2.0 (HTML, CSS & JAVASCRIPT)	I.E.	I.E.	1	1	0	0	2	50	02	50	-	100
						SEM-I Total	**20**	**16**	**5**	**7**	**4**	**450**		**350**		**800**
CHEMISTRY CYCLE																
1	BSC	1	23MAT11A	Calculus, Differential Equations & Linear Algebra	Maths	Maths	4	3	2	0		50	03	50	-	100
2	IBSC	1	23CHI12A	Chemistry of smart materials	CHE	CHE	4	2	2	2		50	03	50	-	100
3	ESC	1	23ECT13A	Introduction to Electronics	ECE	ECE	3	3	0	0		50	03	50	-	100
4	ESC	2	23CVT14A	Introduction to Civil Engineering	CV	CV	3	3	0	0		50	03	50	-	100
5	IESC	1	23CDI15A	Drawing for Engineers	CV/ME	CV/ME	4	3	0	2		50	03	0	50	100
6	HSMC	1	23SKAH03/ 23BKAH04	Samskrutika Kannada / Balake Kannada	HSS	HSS	PP/NP	1	0	0		50	-	0	-	50
7	HSMC	2	23CIPH05	Constitution of India & Professional Ethics	HSS	HSS	1	1	0	0	@	50	02	50	-	100
8	NCMC	1	23PDSN01	Skills for Success: An approach to aptitude and soft skills	I.E.	I.E.	PP/NP	0	0	0	2	50	-	0	-	50
9	AEC	1	23CSAE11	WEB 2.0 (HTML, CSS & JAVASCRIPT)	I.E.	I.E.	1	1	0	0	2	50	02	50	-	100
						SEM-I Total	**20**	**17**	**4**	**6**	**4**	**450**		**300**		**800**

BSC - Basic Science Course; IBSC - Integrated Basic Science Course; ESC - Engineering Science Course; IESC - Integrated Engineering Science Course; HSMC - Humanities, Social sciences & Management Course; AEC - Ability Enhancement Course. {CSE^ --> CSE Stream} {@ - Compulsory one activity during the semester} {I.E - Industry Expert.}

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AUTONOMOUS SCHEME (Tentative) UG - BE First Year for CSE/ISE/AI&ML/CSE(DS)

SCHEME: 2023 **SEM: II** **Date of Revision: 23-08-2024**

SL No	Course Type	Course type Series	Course Code	Course Title	Teaching Dept.	QP setting dept	Credits	Teaching Hrs/Week				Examinations				
								L	T	P	O	CIE Marks	SEE			Tot. Marks
								Lecture	Tutorial	Practical	PBL/ABL/ SL/othrs.		Dur.	Th. Mrks	Lab. Mrks	
CHEMISTRY CYCLE																
1	BSC	1	23MAT21A	Transform calculus and Numerical Methods	Maths	Maths	**4**	3	2	0		50	03	50	-	100
2	IBSC	1	23CHI22A	Chemistry of smart materials	CHE	CHE	**4**	2	2	2		50	03	50	-	100
3	ESC	1	23ECT23A	Introduction to Electronics	ECE	ECE	**3**	3	0	0		50	03	50	-	100
4	ESC	2	23CVT24A	Introduction to Civil Engineering	CV	CV	**3**	3	0	0		50	03	50	-	100
5	IESC	1	23CDI25A	Drawing for Engineers	CV/ME	CV/ME	**4**	3	0	2		50	03	0	50	100
6	HSMC	1	23SKAH03/ 23BKAH04	Samskrutika Kannada / Balake Kannada	HSS	HSS	**PP/NP**	1	0	0		50	-	0	-	50
7	HSMC	2	23CIPH05	Constitution of India & Professional Ethics	HSS	HSS	**1**	1	0	0	@	50	2	50	-	100
8	NCMC	1	23PDSN02	Skilful Harmony: Bridging aptitude and soft skills	I.E.	I.E.	**PP/NP**	0	0	0	2	50	-	0	-	50
9	AEC	2	23CSAE21	Introduction to Python programming	I.E.	I.E.	**1**	1	0	0	2	50	2	50	-	100
						SEM-II Total	**20**	**17**	**4**	**4**	**4**	**450**		**300**		**800**
PHYSICS CYCLE																
1	BSC	2	23MAT21A	Transform calculus and Numerical Methods	Maths	Maths	**4**	3	2	0		50	03	50	-	100
2	IBSC	2	23PHI22A	Physics of Applied science	PHY	PHY	**4**	2	2	2		50	03	50	-	100
3	ESC	3	23EET23A	Fundamentals of Electrical Engineering	EEE	EEE	**3**	3	0	0		50	03	50	-	100
4	ESC	4	23MET24A	Essentials of Mechanical Engineering	ME	ME	**3**	3	0	0		50	03	50	-	100
5	IESC	2	23CPI25A	Problem Solving using C	CSE^	CSE^	**4**	3	0	2		50	03	50	-	100
6	HSMC	3	23ENGH01	Professional Skills in English	HSS	HSS	**PP/NP**	0	1	1		50	-	0	-	50
7	HSMC	4	23ENVH02	Environmental studies	HSS	HSS	**1**	1	0	0	@	50	02	50	-	100
8	NCMC	2	23PDSN02	Skilful Harmony: Bridging aptitude and soft skills	I.E.	I.E.	**PP/NP**	0	0	0	2	50	-	0	-	50
9	AEC	2	23CSAE21	Introduction to Python programming	I.E.	I.E.	**1**	1	0	0	2	50	-	50	-	100
						SEM-II Total	**20**	**16**	**5**	**5**	**4**	**450**		**350**	**0**	**800**

BSC - Basic Science Course; IBSC - Integrated Basic Science Course; ESC - Engineering Science Course; IESC - Integrated Engineering Science Course; HSMC - Humanities, Social sciences & Management Course; AEC - Ability Enhancement Course. {CSE^ --> CSE Stream} {@ - Compulsory one activity during the semester} I.E - Industry Expert

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2	23MAT21A	Transform calculus and Numerical Methods	4 to 6
3	23EET13A/23EET23A	Fundamentals of Electrical Engineering	7 to 9
4	23ECT13/23A	Introduction to Electronics	10 to 12
5	23MET14A/24A	Essentials of Mechanical Engineering	13 to 15
6	23CVT14A/24A	Introduction to Civil Engineering	16 to 18
7	23CPI15A/25A	Problem Solving using C	19 to 21
8	23CDI15A/25A	Drawing for Engineers	22 to 24
9	23PHI12A/22A	Physics of Applied science	25 to 28
10	23CHI12A/22A	Chemistry of smart materials	29 to 32
11	23BKAH04	Balake Kannada (Kannada for Usage)	33 to 35
12	23SKAH03	Samskrutika Kannada	36 to 37
13	23ENGH01	Professional Skills and English	38 to 40
14	23CIPH05	Indian Constitution of India and Professional Ethics	41 to 43
15	23ENVH02	Environmental Studies	44 to 46
16	23PDSN01	Skills for Success: An approach to Aptitude and Soft Skills	47 to 49
17	23PDSN02	Skilful Harmony: Bridging Aptitude and Soft skills	50 to 52
18	23CSAE11	Skill Development Course – 1: WEB 2.0 (HTML, CSS & JAVASCRIPT)	53 to 55
19	23CSAE21	Skill Development Course – 2: Python	56 to 58
20	———	Annexure-CIE & SEE Guidelines	59 to 70

Semester:	I	**Course Type:**	BSC		
Course Title: Calculus, Differential Equations and Linear Algebra					
Course Code:	23MAT11A			**Credits:**	4
Teaching Hours/Week (L:T:P:O)			3:2:0:0	**Total Hours:**	50
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I. Course Objectives:

- To facilitate the students with a foundation of differential calculus.
- To develop proficiency in solving ordinary differential equations arising in engineering applications.
- Develop the knowledge of Linear Algebra referring to matrices.
- Familiarize the importance of Integral calculus and Vector calculus.

II. Teaching-Learning Process (General Instructions):

1. In addition to the traditional lecture method, innovative teaching methods shall be adopted.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples.
3. Grading assignments and quizzes and documenting students' progress.
4. Encourage the students for group learning to improve their creative and analytical skills.

Pre-requisites

1. Trigonometric formulae.
2. Differentiation, Integration and properties.
3. Basic knowledge of scalar, vector and Matrix operations.

III. COURSE CONTENT

Module-1:Differential calculus	10 Hours

Polar curves – Angle between the radius vector and tangent, angle between two curves, pedal equation. Curvature and radius of curvature – Cartesian and pedal forms (no derivations)-problems. Taylor's and Maclaurin's series. **Partial differentiation:** Definition and problems, Jacobians-definition and problems. Maxima and minima for a function of two variables.

Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 4.3(4), 4.4, 4.7(1, 2), 4.8 , 4.10,4.11(1,5) 5.1, 5.2,5.7, 5.11 of textbook 1.

Self Study: Radius of curvature in Parametric form, Partial derivatives: Implicit functions, total derivatives and composite functions.

RBT Levels: L1, L2 and L3.

Module-2: Integral calculus	10 Hours

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, Problems. **Beta and Gamma functions:** Definitions, properties, relation between Beta and Gamma functions. Problems.	
Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 7.1 to 7.5, 7.14, 7.15 & 7.16 of Textbook 1.	
Self Study: Application to find Volume.	
RBT Levels:L1, L2 and L3.	
Module-3: Vector calculus	10 Hours
Vector Differentiation: Scalar and vector fields, vector differentiation, gradient, divergence and curl. Solenoidal and Irrotational fields, physical interpretations, problems involving practical situations. **Curvilinear coordinates:** Scale factors, base vectors, Cylindrical polar coordinates and Problems.	
Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 8.1, 8.4, 8.5, 8.6, 8.7, 8.18 8.19, 8.20 of Textbook 1.	
Self Study: Spherical polar coordinates, orthogonality and Problems. Vector identities.	
RBT Levels: L1, L2 and L3.	
Module-4: Solution of first Ordinary Differential equations	10 Hours
Linear and Bernoulli's differential equations. Exact differential equations. Orthogonal trajectories (Cartesian form only). Second order linear ODE's with constant coefficients: Inverse differential operator, Homogeneous and non Homogeneous DE's ($e^{ax}, \sin ax$ or $\cos ax, polynomial$), Method of variation of parameters.	
Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 11.9 (only for introduction), 11.10, 11.11,12.3 (1, 2), 13.1, to 13.6 and 13.8(1) of Textbook 1.	
Self Study: Reducible to exact differential equations. Orthogonal trajectories – polar form. Applications-LR circuits.	
RBT Levels: L1, L2 and L3.	
Module-5: Linear Algebra	10 Hours
Rank of a matrix by echelon and normal form. Consistency and Solution of system of linear equations. Gauss-elimination method. Approximate solution by Gauss-Seidel method. Determination of largest Eigen values and the corresponding Eigen vector by Rayleigh's power method.	
Textbook:Chapter: Sections: Discussion and coverage of contents as suggested in articles 2.7(1,2,7), 2.10(1), 28.6(1) 28.7(2)and 28.9 of Text book 1.	
Self Study: LU decomposition method and Gauss-Jordan method.	
RBT Levels: L1, L2 and L3.	

IV. COURSE OUTCOMES

CO1	Apply the knowledge of single and multivariable calculus to solve the problems on polar curves.
CO2	Apply the concept of change of order of integration and change of variables to evaluate multiple integrals and their usage in computing the area.
CO3	Understand the applications of vector calculus refer to Solenoidal, Irrotational Vectors and curvilinear coordinates.

CO4	Solve ordinary differential equations analytically using standard methods.
CO5	Make use of matrix theory for solving the system of linear equations and compute eigen values and eigenvectors

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3	2										1				
CO2	3	2										1				
CO3	3	2										1				
CO4	3	2										1				
CO5	3	2										1				

VI. Assessment Details (CIE & SEE)

General Rules: Refer Annexure section 1

Continuous Internal Evaluation (CIE): Refer Annexure section 1

Semester End Examination (SEE): Refer Annexure section 1

VII. Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Name of the publisher	Edition and Year
1	Higher Engineering Mathematics	B.S. Grewal	Khanna Publishers	44th Ed., 2018.

VII(b): Reference Books:

1	Advanced Engineering Mathematics	E. Kreyszig	John Wiley & Sons	10th Ed., 2016
2	A Textbook of Engineering Mathematics	N.P Bali and Manish Goyal	Laxmi Publications	10th Ed., 2022
3	Higher Engineering Mathematics	B.V.Ramana	Tata Mc Graw-Hill	11th Ed., 2017
4	Linear Algebra and its Applications	Gilbert Strang	Cengage Publications	4th Ed., 2022.
5	"Linear Algebra and its Applications"	David C Lay	Pearson Publishers	4th Ed., 2018.

VII(c): Web links and Video Lectures (e-Resources):

1. http://nptel.ac.in/courses.php?disciplineID=111
2. http://www.class-central-central.com/subject/math(MOOCs)
3. http://academiccarth.org/
4. VTU EDUSAT programme-20

VIII: Activity Based Learning

Assignments, quiz and presentation.

Semester:	II	**Course Type:**	BSC		
Course Title: Transform calculus and Numerical Methods					
Course Code:	23MAT21A			**Credits:**	4
Teaching Hours/Week (L:T:P:O)			3:2:0:0	**Total Hours:**	50
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I. Course Objectives:

1. Learn to use the Fourier series to represent periodical physical phenomena in Engineering analysis.
2. To facilitate the students with a concrete foundation of Laplace transforms.
3. Apply the knowledge of Numerical methods to develop computer algorithms.

II. Teaching-Learning Process (General Instructions):

1. In addition to the traditional lecture method, innovative teaching methods shall be adopted.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples.
3. Grading assignments and quizzes and documenting students' progress.
4. Encourage the students for group learning to improve their creative and analytical skills.

Pre-requisites

1. Trigonometric formulae.
2. Differentiation, Integration and properties.

III. COURSE CONTENT

Module-1: Partial Differential equations(PDE's)	10 Hours

Formation of Partial differential equations by elimination of arbitrary constants and functions, Solution of Lagrange's linear PDE. Derivation of one-dimensional heat and wave equations and solutions by the method of separation of variables.

Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 17.2, 17.5, 18.4(1, 2) and 18.5(1, 2) of Textbook 1.

Self study: Solution of non-homogeneous Partial differential equations by direct integration, Homogeneous Partial differential equations involving derivative with respect to one independent variable.

RBT Levels:L1, L2 and L3

Module-2:Fourier series	10 Hours

Introduction to infinite series, convergence and divergence. Periodic functions, Dirichlet's condition. Fourier series of periodic functions with period 2π and arbitrary period. Half range Fourier series. Practical harmonic analysis.

Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 10.1, 10.2, 10.4, 10.6,10.7 10.11 of Textbook 1.

Self Study: Complex Fourier Series.

RBT Levels: L1, L2 and L3

Module-3:Numerical methods	10 Hours

Solution of algebraic and transcendental equations: Newton-Raphson method.

Finite Differences and Interpolation: Forward, Backward differences, Interpolation, Newton-Gregory Forward and Backward Interpolation formulae, Interpolation with unequal Intervals: Newton divided difference interpolation formula and Lagrange interpolation formula (no proof), problems.

Numerical Integration: Simpson 1/3rd rule and Simpson 3/8th rule.

Textbook: Chapter: sections: Discussion and coverage of contents as suggested in articles 28.2(3), 29.1(1, 2), 29.6, 29.9, 29.10, 29.11, 29.12, 30.4, 30.7, 30.8 of Textbook 1.

Self study: Regula-falsi method and Trapezoidal rule.

RBT Levels: L1, L2 and L3

Module-4: Laplace Transforms	10 Hours

Existence and Uniqueness of Laplace transform, transforms of elementary functions (statements only). Problems on Laplace's Transform of $e^{at}f(t)$, $t^n f(t)$, $\frac{f(t)}{t}$. Laplace transforms of Periodic functions (statement only) and unit-step function – problems.

Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 21.1to 21.5, 21.9, 21.10 , 21.17 of Textbook 1.

Self study: Unit impulse function, applications.

RBT Levels: L1, L2 and L3

Module-5: Inverse Laplace Transforms	10 Hours

Inverse Laplace transforms definition and problems, Convolution theorem to find the inverse Laplace transforms (without Proof) problems. Laplace transforms of derivatives, solution of differential equations.

Textbook:Chapter:sections: Discussion and coverage of contents as suggested in articles 21.12, 21.13, 21.14, 21.7, 21.15 of Textbook 1.

Self Study: Differentiation, Integration and its properties.

RBT Levels: L1, L2 and L3

IV. COURSE OUTCOMES

CO1	Demonstrate partial differential equations and their solutions for physical interpretations.
CO2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in communications system.
CO3	Apply the knowledge of numerical methods in solving physical and engineering phenomena.
CO4	Understand the concept of Laplace transform and solve the problems on periodic functions and unit step functions.

CO5	To solve initial value problems using Laplace transform.

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3	2										1				
CO2	3	2										1				
CO3	3	2										1				
CO4	3	2										1				
CO5	3	2										1				

VI. Assessment Details (CIE & SEE)

General Rules: Refer Annexure section 1

Continuous Internal Evaluation (CIE): Refer Annexure section 1

Semester End Examination (SEE): Refer Annexure section 1

VII. Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Name of the publisher	Edition and Year
1	Higher Engineering Mathematics	B.S. Grewal	Khanna Publishers	44th Ed., 2018.

VII(b): Reference Books:

1	Advanced Engineering Mathematics	E. Kreyszig	John Wiley & Sons	10th Ed., 2016
2	Higher Engineering Mathematics	H. K. Dass and Er. Rajnish Verma	S. Chand Publication,	3rd Ed., 2014.
3	Higher Engineering Mathematics	B.V.Ramana	Tata Mc Graw-Hill	11th Ed., 2017
4	Calculus	James Stewart	Cengage publications	7thedition, 2019.
5	Introductory Methods of Numerical Analysis	S.S.Sastry	Tata McGraw-Hill	11th Edition .

VII(c): Web links and Video Lectures (e-Resources):

5. http://nptel.ac.in/courses.php?disciplineID=111
6. http://www.class-central-central.com/subject/math(MOOCs)
7. http://academiccarth.org/
8. VTU EDUSAT programme-20

VIII: Activity Based Learning

Assignments, quiz and presentation.

Semester:	I/II	**Course Type:**	ESC		
Course Title: Fundamentals of Electrical Engineering					
Course Code:	23EET13A/23EET23A		**Credits:**		3
Teaching Hours/Week (L:T:P:O)			3:0:0:0	**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I .Course Objectives:

This course will enable students:

1. To understand electricity evolution and electricity invention experiments.
2. To have an insights of energy sources and general structure of power system.
3. To study fundamentals of AC and analyse DC circuits.
4. To understand the construction, working principle and applications of electrical machines.
5. To explore fundamentals of solar PV systems, batteries, UPS and its applications.
6. To study the domestic wiring, tariff and electrical safety practices.

II.Teaching-Learning Process (General Instructions):

- Chalk and talk method
- Power point presentation / keynotes
- Videos
- Animations

III.COURSE CONTENT

Module-1: History of electricity and sources of electrical energy — 8 Hours

History of electricity (Review only): Evolution of electricity & electrical inventions (benjamin franklin kiteexperiment, thomas alva edison bulb invention)

Introduction: Conventional and non-conventional energy resources; general structure of electrical power systems using single line diagram approach.

Sources of electrical energy- Brief introduction to electrical generation using thermal, solar, hydro, wind (Blockdiagram approach).

Textbook: Chapter: sections:

A Course in Power systems, J B Gupta : Part-1, Chapter-1, section-1.3,1.4,1.5, Chapter-7, section 7.7,7.8

2. Power system engineering, Chakrabarty Part-1, chapter-2, section 2.2, Chapter-3, section-3.6, Part-2 Chapter-1,section-1,

Pre-requisites (Self Learning): Basics of Electricity.

RBT Levels: L1, L2

Module-2 : DC circuits and AC fundamentals — 8 Hours

DC Circuits: Introduction to DC circuits, ohms law, kirchhoff's laws, concept of power and energy. analysis ofseries parallel circuits. Numerical.

AC Fundamentals: Generation of sinusoidal voltage, concept of phasors, time period, frequency, instantaneous values, peak, average, RMS value, peak factor, and form factor. Numerical.

Textbook: Chapter: sections: Basic electrical engineering, D C Kulshreshtha : Chapter 2, Section-2.1,2.2,Chapter-3, Section-3.6, 3.7,3.8,3.9, Chapter-9, Section- 9.1,9.2,9.3

Pre-requisites (Self Learning):

Faraday's Laws of Electromagnetic Induction

RBT Levels: L1, L2, L3

Module-3: Single-phase transformers and DC motor	8 Hours

Single phase transformers: Construction and types, operating principle, EMF equations, losses and efficiency.Numerical.

DC Motor: Principle of operation, back emf and its significance. Torque equation, types of motors,characteristics of DC motors (series & shunt only). Applications of DC motors. Numerical.

Textbook: Chapter: sections: Basic electrical engineering, D C Kulshreshtha : Chapter 13, Section-13.1,13.2,13.5,13.10

Chapter-16 : Section- 16.2, 16.11,16.12,16.13.

Pre-requisites (Self Learning): Mutual Induction principle, Fleming's right-hand rule.

RBT Levels: L1, L2, L3

Module-4: Domestic wiring and safety measures	8 Hours

Domestic wiring: Introduction, service mains, meter board and distribution board. Types of domestic wiring. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity billfor domestic consumers.

Equipment safety measures: Working principle of fuse and Miniature Circuit Breaker (MCB), merits and demerits.

Personal safety measures: Electric shock and safety precautions, earthing and its types (plate and pipe)

Textbook: Chapter: sections: Basic electrical engineering, D C Kulshreshtha : Chapter 19 : Section 19.2 to19.10.

Pre-requisites (Self Learning): Fleming's right-hand rule.

RBT Levels: L1, L2, L3

Module-5: UPS basics and fundamentals of solar PV systems and battery	8 Hours

UPS basics: Introduction, types of UPS, applications, example UPS of battery calculations.

Fundamentals of Solar PV systems and Battery: Overview of solar energy conversion devices and applications, basics of batteries and it's parameters, applications of batteries.

Textbook: Chapter: sections: 1. Uninterrupted power supply system, kamal Maity, Chapter 1,2,4&6

2. Non conventional energy sources, G D Rai, Chapter-3, section-3.1 to 3.3, Chapter -5, Section-5.2,5.6,5.11, Chapter-10, Section-10.3

Pre-requisites (Self Learning): Fundamentals of single-phase AC supply.

RBT Levels: L1, L2, L3

IV.**COURSE OUTCOMES**

At the end of the course students will be able to

CO1	Understand the evolution of electricity, sources of electrical energy and structure of power system.
CO2	Study of basic DC circuits and AC fundamentals
CO3	Explain the construction, types and working of electrical machines.
CO4	Describe the concepts of domestic wiring and safety measures.
CO5	Enumerate the applications of UPS, Battery and solar PV systems.

V.**CO-PO-PSO MAPPING** (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3	1	-	-	-	1	1	1	-	-	-	2	2	-	-	-
CO2	3	2	-	-	-	1	1	1	-	-	-	2	2	-	-	-
CO3	3	2	-	-	-	1	1	1	-	-	-	2	2	2	-	-
CO4	3	2	-	-	-	2	2	1	-	-	-	2	2	-	-	-
CO5	3	1	-	-	-	1	1	1	-	-	-	2	2	-	-	-

VI. Assessment Details (CIE & SEE)

General Rules: Refer appendix section 1

Continuous Internal Evaluation (CIE): Refer appendix section 1

Semester End Examination (SEE): Refer appendix section 1

VII. Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Basic electrical engineering	D C Kulshreshtha	2nd edition, 2019	Tata McGraw hill.
2	A Course in power systems	J B Gupta	11th edition, reprint 2021	S.K. Kataria & sons
3	Uninterrupted power supply system	Kamal Maity	1st edition, 2017	Independently published
4	Power system engineering	A Chakrabarti , M L Soni	1st edition reprint, 2007	Dhanpat rai & Co
5	Non conventional sources of energy	G D Rai	6th edition, 2017	Khanna publishers

VII(b): Reference Books:

1	A Textbook of electrical technology	B.L.Theraja	Reprint edition 2014.	S Chand and company
2	Basicelectrical engineering	D.P. Kothari	4th edition,2019.	McGraw-Hill education

VII(c): Web links and Video Lectures (e-Resources):

Mention the links of the online resources, video materials, etc.
https://www.youtube.com/@eeedepartment4878
https://www.youtube.com/watch?v=6p5WXzrYYiI
https://www.youtube.com/watch?v=0wkjlSZt0ko

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Activities like seminar, assignments, quiz, case studies, mini projects, industry visit, self-study activities,group discussions, etc

Semester:	I/II	**Course Type:**	ESC		
Course Title: Introduction to Electronics					
Course Code:	23ECT13/23A			**Credits:**	3
Teaching Hours/Week (L:T:P:0)			3:0:0:0	**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I. Course Objectives:

Students will be taught

1. Operation of Semiconductor Diode, Zener diode and Rectifier
2. Construction, Operation and characteristics of BJT and FET.
3. Study of linear Op-amps and its applications.
4. Basic concepts of digital circuits and microprocessors.
5. Principles of Communication systems and cellular wireless networks.

II. Teaching-Learning Process:

1. Chalk and Talk method
2. Power point presentation and/keynote
3. Videos
4. Virtual Labs

III.COURSE CONTENT

Module-1	8 Hours

Semiconductor Diodes and Applications:

Semiconductor diode, Ideal vs Practical, Resistance levels, Diode Equivalent Circuits, Semiconductor diode notation, Zener diode, Load line Analysis, Half wave rectification, Full wave rectification

Text1: Chapter 1 & 2

RBT Levels: L1 L2**,** L3

Module-2	8 Hours

BJT and FET:

Bipolar Junction Transistor: Transistor construction, Transistor operation, Common Base configuration, Common Emitter configuration, Common collector configuration, Operating point, **Field Effect Transistor**: Introduction, Construction and characteristics of JFETs, Transfer Characteristics, Important relationships, Depletion Type MOSFET, Enhancement-Type MOSFET

Text 1: Chapter 3 & 6

RBT Levels: L1, L2, L3

Module-3	8 Hours

Operational Amplifiers:
Introduction, Op-amp basics, Practical Op-Amp Circuits, Op-Amp specifications-DC Offset parameters, Op-Amp Specifications-Frequency parameters, Op-Amp unit Specifications.

Text 1: Chapter 10

RBT Levels: L1, L2, L3

Module-4	8 Hours

Digital Circuits:
Analogue Versus Digital, Introduction to Number Systems and conversions, Logic gates, Introduction to Boolean Algebra, Postulates of Boolean Algebra, Theorems of Boolean Algebra, Arithmetic Circuits – Half-Adder, Full Adder.
Microprocessors: Introduction to Microprocessors, Evolution of Microprocessors, Inside a Microprocessor, Basic Microprocessor Instructions, Addressing Modes, Programming Microprocessors.

Text 2: Chapter 1,3,5,6 & 12

RBT Levels: L1, L2, L3

Module-5	8 Hours

Communication System : Modern communication system scheme, Information source, and input transducer, Transmitter, Channel or Medium, Noise, Receiver, Types of communication systems.
Cellular Wireless Networks : Cellular Telephone System, Cellular concept and frequency Reuse, First Generation (1G) Technology, Second Generation (2G) Technology, Third Generation (3G) Technology, High-level architecture of LTE ,Fourth Generation (4G) Technology, Bluetooth .

Text 3: Chapter 1 & 8

RBT Levels: L1, L2, L3

IV.**COURSE OUTCOMES**

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

CO1	Understand the Construction, Operation, Characteristics and Applications of semiconductor devices.
CO2	Apply the acquired knowledge of semiconductor devices to construct small scale circuits like BJT and FET.
CO3	Analyse the working of Op -Amp in various circuits.
CO4	Design simple digital circuits by using logic gates and programming of microprocessor.
CO5	Summarize the conceptual blocks of Modern Communication system and concepts of Cellular systems.

V.**CO-PO-PSO MAPPING** (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3	2	1										2			
CO2	3	2	1										2			
CO3	3	2	1										2			
CO4	3	2	1										2			
CO5	3	2				1							2			

VI. **Assessment Details (CIE & SEE)**

General Rules: Refer appendix section 1

Continuous Internal Evaluation (CIE): Refer appendix section 1

Semester End Examination (SEE): Refer appendix section 1

VII.**Learning Resources**

VII(a): Textbooks:

Title of the Book	Name of the author	Edition and Year	Name of the publisher
Electronic devices and circuit theory	Robert l.Boylestad Louis Nashelsky	Eleventh Edition,2013	Pearson
Digital Electronics Principles, Integrated Circuits	Anil K. Maini	2019	Wiley
Communication Systems	S L Kakani and Priyanka Punglia	2017	New Age International Publisher

VII(b): Reference Books:

Electronic Devices and Circuits	David A Bell	5th Edition, 2016	Oxford
Digital Logic and Computer Design,	M. Morris Mano	2008 ISBN-978-81-203-0417-8	PHI Learning

VII(c): Web links and Video Lectures (e-Resources):

- https://nptel.ac.in/courses/122106025
- https://nptel.ac.in/courses/108105132
- https://nptel.ac.in/courses/117104072
- https://youtu.be/C0s7TS6HK0I
- https://youtu.be/j8V8nDCIHXY

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Welcome to Virtual Labs - A MHRD Govt of India Initiative (vlabs.ac.in) Welcome to Virtual Labs - A MHRD Govt of india Initiative (vlabs.ac.in) Welcome to Virtual Labs - A MHRD Govt of india Initiative (vlabs.ac.in)
Welcome to Virtual Labs - A MHRD Govt of india Initiative (vlabs.ac.in)

Semester:	I/II	**Course Type:**	ESC		
Course Title: Essentials of Mechanical Engineering					
Course Code:	23MET14A/24A			**Credits:**	3
Teaching Hours/Week (L:T:P:O)			3:0:0:0	**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I. Course Objectives:

This course will enable students:

- Acquire basic knowledge of mechanical engineering and fundamentals of non-conventional energy sources.
- Attain knowledge about traditional and advanced manufacturing processes.
- Procure basic concepts of IC engines, and Electric vehicles.
- Obtain the knowledge of mechatronics and robotics.
- Gain the fundamental concepts of composite materials and joining processes.

II. Teaching-Learning Process (General Instructions):

- Adopt different types of teaching methods to develop the outcomes through Power point presentations and Video demonstrations or Simulations.
- Arrange visits to show the working models & processes.
- Adopt collaborative (Group Learning) Learning in the class.
- Adopt Problem Based Learning (PBL), which foster students' Analytical skills and develops thinking skills such as evaluating, generalizing, and analysing information.

III. COURSE CONTENT

Module-1: 8 Hours

Introduction to Mechanical Engineering:
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 Sources and Power Plants:
Basic working principles of Hydel power plant, Thermal power plant, nuclear power plant, Solar power plant, Tidal power plant and Wind power plant.

Pre-requisites (Self Learning): Basic knowledge of power generation

RBT Levels: L1, L2

Module-2: 8 Hours

Machine Tool Operations:
Lathe: Principle of working of a centre lathe, lathe operations: Turning, facing, knurling,thread cutting, taper turning by swivelling the compound rest.
Drilling Machine: Working of simple drilling machine, drilling operations: drilling, boring,reaming, tapping, counter sinking, counter boring.
Milling Machine: Principle, Working and types of milling machine, milling operations: planemilling, end milling and slot milling.

(No sketches of machine tools, sketches to be used only for explaining the operations).	
Pre-requisites (Self Learning): Basic knowledge of machine tools	
RBT Levels: L1, L2	
Module-3:	8 Hours
Introduction to IC Engines: Components and working principles of 2 & 4-Stroke Petrol engine and 4-Stroke Diesel engines, performance of IC engines **Insight into future mobility technology**; Introduction to Electric and Hybrid Vehicles, Working Principle, Advantages and disadvantages of Electric Vehicles (EVs) and Hybrid vehicles. Emission standards.	
Pre-requisites (Self Learning): Basic knowledge of automobiles	
RBT Levels: L1, L2	
Module-4:	8 Hours
Mechanical Power Transmission: Belt Drives: Introduction, Types of belt drives (Open andCross Belt Drive), length of the belt and tensions. **Gear Drives**: Types - spur, helical, bevel, worm and rack and pinion, velocity ratio, simple andcompound gear trains. **Joining Processes**: Soldering, Brazing and Welding, Definitions, classification of weldingprocess, Arc welding, Gas welding, (types of flames)	
Pre-requisites (Self Learning): Basic knowledge of power transmissions and Joining Process	
RBT Levels: L1, L2, L3	
Module-5:	8 Hours
Introduction to Modern Manufacturing Tools and Techniques: **CNC**: Introduction, components of CNC, advantages and applications of CNC, Concepts ofSmart Manufacturing and Industrial IoT. **Introduction to Robotics:** Open-loop and closed-loop control systems. Joints & links, Robotanatomy, Applications of Robots in material handling, processing, assembly and inspection.	
Pre-requisites (Self Learning): Basic knowledge of Manufacturing process	
RBT Levels: L1, L2	

IV.**COURSE OUTCOMES**

CO1	Understand the basic concepts of mechanical engineering in the field of energy & its utilization
CO2	Determine the conventional processes in manufacturing of components.
CO3	Interpret the fundamental concepts of engines & future mobility technology.
CO4	Apply the basic concept of transmission system and joining process
CO5	Enumerate the application of advanced machining processes and robotics in manufacturing.

V.**CO-PO-PSO MAPPING** (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3															
CO2	3	2														
CO3	3	2					1									
CO4	3	2														
CO5	3															

VI.**Assessment Details (CIE & SEE)**

General Rules: Refer Annexure Section 1

Continuous Internal Evaluation (CIE): Refer Annexure Section 1

Semester End Examination (SEE): Refer Annexure Section 1

VII. **Learning Resources**

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Elements of Mechanical Engineering,	K R Gopala Krishna,	2019	Subhash Publications
2	Elements of Workshop Technology (Vol. 1 and 2)	Hazra Choudhry and Nirzar Roy	2010	MediaPromoters and Publishers Pvt.

VII(b): Reference Books:

1	An Introduction to Mechanical Engineering	Jonathan Wickert and Kemper Lewis	Third Edition	S Chand and Company
2	Manufacturing Technology- Foundry, Forming and Welding	P.N.Rao	Vol 1, 2019	Tata McGraw Hill
3	Robotics	Appu Kuttan KK	volume 1	K. International Pvt Ltd,
4	Automation, production system and CIM	Mikell P Grover	4th edition, 2018	

VII(c): Web links and Video Lectures (e-Resources):

- https://youtu.be/cT9UN1XENNk?si=EtVUDGO8cHU5xWfY
- https://youtu.be/fw8Jfoif1BM?si=IbGrPZSPpcyW2BZq
- https://www.youtube.com/watch?v=mNOYS-duUJYEV Electrical Systems BASICS!
- https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing- and-process-industry/
- Videos | Makino (For Machine Tool Operation)

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

1. Visit to any manufacturing/aero/auto industry or any power plant
2. Demonstration of lathe/milling/drilling/CNC operations
3. Demonstration of working of IC engine
4. Demonstration of metal joining process
5. Video demonstration of latest trends in mobility/robotics

Semester:	I/II	**Course Type:**	ESC		
Course Title: Introduction to Civil Engineering					
Course Code:	23CVT14A/24A			**Credits:**	3
Teaching Hours/Week (L:T:P:O)			3:0:0:0	**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I. Course Objectives:

- To make students learn the scope of various fields of civil engineering.
- To develop student's ability to analyse the problems involving forces, moments with their applications.
- To develop the student's ability to find out the center of gravity and moment of inertia and theirapplications.

II. Teaching-Learning Process (General Instructions):

Chalk and talk, videos, Power Point presentation, animations.

COURSE CONTENT

Module-1: Introduction to Civil Engineering — 8 Hours

INTRODUCTION TO CIVIL ENGINEERING: Scope of different fields of Civil Engineering-Surveying, Building Materials, Construction Technology, Geotechnical Engineering, Structural Engineering, Hydraulics, Water Resources and Irrigation Engineering, Transportation Engineering, Environmental Engineering. Effect of the infrastructural facilities on socio-economic development of a country.

CIVIL ENGINEERING MATERIALS: Stone as building material; Requirement of good building stones,Bricks; Classification, Requirement of good bricks. Cement Concrete blocks-requirement of good blocks.

Timber as construction material.

Fine aggregate: Natural and manufactured sand

Coarse aggregate: Natural and manufactured aggregate.

Textbook: H. J Sawant**: Chapter-1: sections-1**

Self-Learning: Smart materials used in construction

RBT Levels: L1 L2

Module-2: Building Construction — 8 Hours

BUILDING CONSTRUCTION: Function and requirements of good foundation, types of foundation,introduction to spread, combined, strap, mat and pile foundation.

Masonry: Definition and terms used in masonry. Brick masonry, characteristics, and requirements of goodbrick masonry, Requirements of good stone masonry, Classification.

Lintels and Arches: Definition, function, and classification of lintels.

Floors and roofs: Requirement of good floor and roof.

Plastering and Pointing: Mortar and its types. Purpose,

materials**Textbook**: H. J Sawant**: Chapter 3 &4: Sections 3&4**

Self-Learning: Application of AI & ML in Building construction.

RBT Levels: L1 L2

Module-3: Analysis of Force Systems — 8 Hours

ANALYSIS OF FORCE SYSTEMS: Concept of idealization, force, a system of forces, superposition, transmissibility, Resolution, and composition of forces, Law of Parallelogram of forces, polygonal law, Resultant of concurrent coplanar force system, coplanar non-concurrent force system, a moment of forces, couple, Varignon's theorem, resultant of coplanar non-concurrent force system – Numerical problems.
Textbook: H. J Sawant**: Chapter 6&8: Sections 6 & 8**
Self-Learning: Free body diagram for complex figures (3D)
RBT Levels: L1 L2 L3

Module-4: Equilibrium of Bodies	8 Hours

ANALYSIS OF BODIES IN EQUILIBRIUM: Free body diagrams, Lami's theorem, Equations of Equilibrium, Equilibrium of coplanar concurrent and non-concurrent force systems – Numerical problems.
ANALYSIS OF BEAMS: Types of Loads and Supports, statically determinate and indeterminate beams,Support Reaction in beams, Numerical problems on support reactions for statically determinate beams(Point load, UDL & uniformly varying loads and Moments).
Textbook: H. J Sawant**: Chapter 7&12: Sections 7 & 12**
Self-Learning: Finding support reactions for a complex loaded beam
RBT Levels: L1 L2 L3

Module-5: Centroid and Moment of Inertia	8 Hours

CENTROID: Introduction, methods of determining the centroid, locating the centroid of simple figures from first principle, Centroid of composite and built-up sections – Numerical problems.
MOMENT OF INERTIA: Introduction, method of determining the second moment of area of plane sections from first principles, parallel axis theorem and perpendicular axis theorem section modulus, the radius of gyration, moment of inertia of composite area and built-up sections – Numerical problems. conceptof product of inertia (No problem).
Textbook: H. J Sawant**: Chapter 10&11: Sections 10 &**
11Self-Learning: Centroid & MOI for complex figures
RBT Levels: L1 L2 L3

IV.COURSE OUTCOMES

CO1	Summarize the various fields of civil engineering and importance of building materials.
CO2	Apply the knowledge of science to study the effect of force systems on the rigid bodies.
CO3	Analyse the action of force systems on the rigid bodies.
CO4	Determine the centroid and moment of inertia of regular and built-up sections.

V.CO-PO-PSO MAPPING

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	2						2	1				1		1		
CO2	3	2										1		1		
CO3	3	2										1		1		
CO4	3	2										1		1		

VI.Assessment Details (CIE & SEE)

General Rules: Refer Appendix Section 1

Continuous Internal Evaluation (CIE): Refer Appendix Section 1

Semester End Examination (SEE): Refer Appendix Section 1

VII.Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Basic Civil Engineering and Engineering Mechanics	Bansal R. K.	2015	Laxmi Publications
2	Elements of Civil	Kolhapure B K	2014	EBPB

	Engineering and Engineering Mechanics			
3	Elements of Civil Engineering and Mechanics	H. J Sawant	2014	Technical Publications
VII(b): Reference Books:				
1	Mechanics for Engineers, Statics and Dynamics	Beer F.P. and Johnston E. R	1987	McGraw Hill
2	Engineering Mechanics	Bhavikatti S S	2019	New Age International
3	Engineering Mechanics	Reddy Vijaykumar K	2011	BS publication
4	Engineering Mechanics	Timoshenko S	5th Edition, 2017	Pearson Press
5	Mechanics for Engineers, Statics and Dynamics	Beer F.P. and Johnston E. R	1987	McGraw Hill

VII(c): Web links and Video Lectures (e-Resources):

https://www.youtube.com/watch?v=nGfVTNfNwnk
https://www.youtube.com/watch?v=nkg7VNW9UCc
https://www.youtube.com/watch?v=aiT5mcuXf5Y&list=PLOSWwFV98rfKXq2KBphJz95rao7q8PpwT&index=7
https://www.youtube.com/watch?v=VQRcChR9IkU
https://www.youtube.com/watch?v=3YBXteL-qY4
https://www.youtube.com/watch?v=3YBXteL-qY4
https://www.youtube.com/watch?v=lheoBL2QaqU
https://www.youtube.com/watch?v=atoP5_DeTPE
https://www.youtube.com/watch?v=ksmsp9OzAsI
https://www.youtube.com/watch?v=x1ef048b3CE
https://www.youtube.com/watch?v=l_Nck-X49qc
https://play.google.com/store/apps/details?id=appinventor.ai_jgarc322.Resultant_Force
https://www.youtube.com/watch?v=RIBeeW1DSZg
https://www.youtube.com/watch?v=R8wKV0UQtlo
https://www.youtube.com/watch?v=0RZHHgL8m_A
https://www.youtube.com/watch?v=Bls5KnQOWkY
https://www.youtube.com/watch?v=nFBvLIfFFqI

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

https://www.youtube.com/watch?v=Zrc_gB1YYS0
https://play.google.com/store/apps/details?id=vn.edu.best4u.com.bieudonoiluc
https://www.youtube.com/watch?v=Hn_iozUo9m4
https://play.google.com/store/apps/details?id=com.teobou
https://www.youtube.com/watch?v=WOHRp3V-QA0

Semester:	I/II	**Course Type:**	IESC		
Course Title:	Problem Solving using C				
Course Code:	23CPI15A/25A			**Credits:**	4
Teaching Hours/Week (L:T:P:O)			3:0:2:0	**Total Hours:**	40 + Lab slots
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I. Course Objectives:

This course will enable students to:

- Familiarize with writing of algorithms, flowchart and fundamentals of C.
- Use of different Branching statements and loops
- Use and implement data structures like arrays and structures.
- Implement different programs using functions.
- Define and use of pointers with simple applications.

.II. 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) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL),which fosters student's Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it. 6. Introduce Topics in manifold 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 to improve the student's understanding.
9. Use https://pythontutor.com/visualize.html#mode=edit in order to visualize the operations of C Programs

III.COURSE CONTENT

III(a). Theory PART

Module-1: Introduction.	8 Hours

Introduction to computers: Definition, Characteristics of computers, Stored program concept, History of computers, Classification of computers, Applications of computers, Basic organizationof computers.

Programming Basics & Overview of C: Introduction, Problem solving. Introduction to C, Basicstructure of C program, Programming style.

Textbook1: Chapter1, Textbook2: 3.1, 3.2, 3.7, 3.8, 3.9.

RBT Levels: 1

Module-2: Basics of C.	8 Hours

C-tokens and Data types: Introduction, Character set, C Tokens, Declaration of variables, Storage class,Assigning values to variables, Symbolic constants.
Managing I/O operations and operators: Managing I/O operations, Operators and Expressions.
Control statements: Conditional and Un conditional branching statements with programming examples.Looping statements, break and continue statements.
Textbook 2: Chapter 4: 4.1-4.7, Chapter 5, Chapter 6, Chapter 8, Chapter 9.

RBT Levels: 1,2

Module-3: Arrays and Strings.	8 Hours

Arrays: One-Dimensional Array, Two-Dimensional Arrays (Declaration and Compile Time and Run Time Initialization), reading and displaying arrays, Searching and Sorting.
Strings: Introduction, Character Arrays, Declaring and Initializing String Variables, Reading Strings fromTerminal, Writing Strings to Screen. Various String Handling Functions with programming examples.
Textbook 2:Chapter 10 and 11.

RBT Levels:2,3,4

Module-4: Functions and files.	8 Hours

User Defined Functions:
Need for Functions, Types of functions, function definition, declaration and its scope, Category of functions Storage classes (Automatic, Static, Extern, and Register).
Recursion: Introduction recursion, types in recursive function, programming examples on recursive functions.
Files: Introduction to Files, Types of Files, declaring a File Pointer Variable, opening a File, Closing aFile, Read Data From Files, Writing Data to Files, Detecting the End Of-File
Textbook 2: Chapter 7, Textbook 1: Chapter 11: 11.9, Chapter 16.

RBT Levels:2,3,4

Module-5: Pointers and UDT.	8 Hours

Pointers: Declaration and Initialization of pointers, Obtaining a value of a pointer variable, pointerarrays, programming examples on pointers.
User defined data types: Introduction to structures, unions, and enumerated data types- Declaration and Initializing of variables, Accessing structure, union, and enumerator members, Arrays of structure, Arrayswithin structures, Structure within structures, Structures and functions.
Textbook 1: Chapter 14: 14.1 to 14.12, Chapter 15.

RBT Levels:2,3,4

III(b). PRACTICAL PART

Sl. No.	Experiments / Programs / Problems
1	Write a C Program to find area of a rectangular plot of land
2	Write a C Program to calculate IHP, BHP, CR for a four stroke gas engine.
3	Simulation of a Simple Calculator.
4	An electricity board charges the following rates for the use of electricity: for the first 200 units 80 paisa per unit: for the next 100 units 90 paisa per unit: beyond 300 units Rs 1 per unit. All users are charged a minimum of Rs.100 as meter charge. If the total amount is more than Rs 400, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges.
5	Write a C Program to generate prime numbers up to a given range.
6	Compute sin(x)/cos(x) using Taylor series approximation. Compare your result with the built-in library function. Print both the results with appropriate inferences.
7	Sort the given set of N numbers using Bubble sort.
8	Implement Binary Search on Integers.
9	Implement Matrix multiplication and validate the rules of multiplication.
10	Write functions to implement string operations such as copy and concatenate using user defined functions.
11	Write functions to implement string operations such as compare, reverse and find string length. Use the parameter passing techniques.
12	Write a program to convert given decimal number to binary number using function.

13	Implement structures to read, write and compute average- marks of the students, list the students scoring above and below the average marks for a class of N students.
14	Develop a program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of N real numbers.
15	Write a C program to copy a text file to another, reading both the input file name and target file name.

IV.COURSE OUTCOMES

CO1	Illustrate the basic constructs of C language.
CO2	Understand and apply suitable syntax for various problems.
CO3	Construct programming solutions for various basic problems.
CO4	Implement programs using problem solving skills.

V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	2		1													
CO2	2		1													
CO3	2		2													
CO4	2		2													

VI.Assessment Details (CIE & SEE)

General Rules: Refer Appendix section 2

Assessment Details (both CIE and SEE): Refer Appendix section 2

Semester End Examination (SEE): Refer Appendix section 2

VII.Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Computer fundamentals and programming in C	Reema Thareja	3rd Edition, 2023	Oxford Unversity Press, New Delhi
2	Programming in ANSI C	E. Balaguruswamy	7" Edition	Tata McGraw- Hill

VII(b): Reference Books:

1	The 'C' Programming Language	Brian W. Kernighan and Dennis M. Ritchie	-	Prentice Hall of India
2	Computer Fundamentals & C Programming	Sumitabha Das	-	Mc Graw Hill Education

VII(c): Web links and Video Lectures (e-Resources):

1. elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html
2. https://nptel.ac.in/courses/106/105/106105171/ MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving method
3. https://tinyurl.com/4xmrexre

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

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

- Quizzes
- Assignments
- Seminar

Semester:	I/II	**Course Type:**	IESC		
Course Title: Drawing for Engineers					
Course Code:	23CDI15A/25A			**Credits:**	4
Teaching Hours/Week (L:T:P:O)			3:0:2:0	**Total Hours:**	40 + Lab slots
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I .Course Objectives:

This course will enable students to:

- Attain the basic principles and conventions of engineering drawing
- Understand the use of drawing as a communication mode
- Visualize 2D and 3D pictorial views using CAD software
- Enumerate the concepts of development of lateral surfaces
- Acquire multi-disciplinary concept of applications

II .Teaching-Learning Process (General Instructions):

- Adopt different types of teaching methods to develop the outcomes through Power point presentations and Video demonstrations.
- Adopt teaching methods by using working models
- Adopt collaborative (Group Learning) Learning in the class.
- Adopt Problem Based Learning (PBL), which foster students Analytical skills and develops thinking skills such as evaluating, generalizing, and analysing information with the use of modern tools.

III.COURSE CONTENT

Module-1: 8 Hours

Introduction:

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate systems

Orthographic Projections of Points, Lines and Planes:

Introduction to Orthographic projections, Orthographic projections of points in all the quadrants. Orthographic projections of lines. (Placed in First quadrant only)

Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon and circular lamina. (Placed in First quadrant only- Change of position method).

Pre-requisites (Self Learning): Basics of Geometry

RBT Levels: L1, L2, L3

Module-2: 8 Hours

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.

Pre-requisites (Self Learning): Basics of Geometry

RBT Levels: L1, L2, L3	
Module-3:	8 Hours
Isometric Projections: Isometric scale, Isometric projection of right regular prisms, pyramids, cylinders, cones and spheres. (Isometric projection of combination of two simple solids.) Frustum of cone & square pyramid only.	
Pre-requisites (Self Learning): Basics of Geometry and 3D Drawing	
RBT Levels: L1, L2, L3	
Module-4:	8 Hours
Development of Lateral Surfaces of Solids: Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones restingwith base on HP only.Development of their frustums and truncations.	
Pre-requisites (Self Learning): Basics of Geometry	
RBT Levels: L1, L2, L3	
Module-5: Multidisciplinary Applications & Practice:	8 Hours
Computer Graphics: : Basics of computer graphics, Application of Computer Graphics, Video Display Devices: Random Scan and Raster Scan displays, color CRT monitors, Flat panel displays. Raster-scan systems: video controller, raster scan Display processor, OpenGL: Introduction to OpenGL ,coordinate reference frames, specifying two-dimensional world coordinate reference frames in OpenGL, OpenGL point functions, OpenGL line functions, point attributes, line attributes, curve attributes, OpenGL point attribute functions, OpenGL line attribute functions.	
Pre-requisites (Self Learning): Basics of Drawing	
RBT Levels: L1, L2, L3	

IV.COURSE OUTCOMES

CO1	Understand and visualize the objects with definite shape and dimensions
CO2	Analyse the shape and size of objects through different views
CO3	Create a 3D view using CAD software.
CO4	Develop the lateral surfaces of the object
CO5	Identify the interdisciplinary engineering components and systems through its graphical representation.

V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3	2			2					2		1				
CO2	3	2			2					2		1				
CO3	3	2			2					2		1				
CO4	3	2			2					2		1				
CO5	3	2			2					2		1				

VI.Assessment Details (CIE & SEE)

General Rules: Refer appendix section 3

Continuous Internal Evaluation (CIE): Refer appendix section 3

Semester End Examination (SEE): Refer appendix section 3

VII.Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Engineering Drawing: Planeand Solid Geometry	N.D. Bhatt.	53rd edition,	Charotar Publishing House Pvt. Limited, 2019.

2	Textbook Of Computer Aided Engineering Drawing	K. R. Gopalakrishna, & Sudhir Gopalakrishna:	39th Edition,	Subash Stores, Bangalore, 2017
3	Engineering Visualisation	S.N. Lal, & T Madhusudhan	1st Edition,	Cengage, Publication
4	Fundamentals of Engineering Drawing: with an Introduction to Interactive Computer Graphics for Design and Production	Luzadder Warren J., Duff John M.,	Eastern Economy Edition, 2005.	Prentice-Hall of India Pvt. Ltd., New Delhi,
5	Computer Graphics with OpenGL Version	Donald Hearn & Pauline Baker	3rd / 4th Edition	Pearson Education,2011
VII(b): Reference books:				
1	Engineering Drawing	ParthasarathyN. S., Vela Murali,	2015	Oxford University Press,.
2	C Projects	Yashavant Kanetkar	1995	BPB Publications
NPTEL Videos: https://youtube.com/playlist?list=PLp6ek2hDcoNCjoRLQ4rjpCozisCACBxKA				
VIII: Activity Based Learning / Practical Based Learning/Experiential learning:				
Activities like Model Preparation & Presentation, self-study activities.				

Semester:	I/II	**Course Type:**	IBSC		
Course Title: Physics of Applied science					
Course Code:	23PHI12A/22A			**Credits:**	4
Teaching Hours/Week (L:T:P:O)			2:2:2:0	**Total Hours:**	40+ Lab slots
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I .Course Objectives:

- To study the principles of quantum mechanics and its applications in quantum computing.
- To study the essentials of photonics for engineering applications.
- To study the electrical properties of materials.
- To understand basic concepts of nano materials and study the various relevant material characterization techniques.
- To understand the operations of different instruments and to analyze experimental results.

III. Teaching-Learning Process (General Instructions):

Some of the adapted methods in teaching learning methods are

1. Chalk and Talk
2. Blended Mode of Learning
3. Simulations, Interactive Simulations and Animations
4. Smart Classroom
5. Lab Experiment Videos

III.COURSE CONTENT

III(a).Theory part

Module-1:Modern Physics & Quantum Mechanics — 8 Hours

Modern Physics: Introduction to blackbody radiation spectrum- Wien's law, Rayleigh Jean's law, Stefan - Boltzmann law and Planck's law (qualitative), Deduction of Wien's law and Rayleigh Jeans law from Planck's law of radiation. de-Broglie hypothesis.

Quantum Mechanics: Heisenberg's uncertainty principle – statement and physical significance. Applicationof uncertainty principle - Non-existence of electron in the nucleus. Wave function - properties and physical significance. Probability density and normalization of wave function. Setting up of one-dimensional time independent Schrödinger wave equation. Eigen functions and Eigen values. Applications of Schrodinger's wave equation: Particle in a one-dimensional infinite potential well, Numerical problems.

Engineering physics by G. Aruldhas: Chapter: 9- Quantum Mechanics
Engineering Physics by R K Guptha and R K Gaur: Chapter: 56-Quantum Theory 57-Waves and particle

Pre-requisites (Self Learning) Phase velocity and group velocity

RBT Levels: L1 – Remembering, L2 – Understanding, L3 – Applying.

Module-2: Quantum Computing — 8 Hours

Function in Ket Notation: Matrix form of wave function, Identity Operator, Determination of I|0> and I|1>, Pauli Matrices and its operations on 0 and 1 states, Mention of Conjugate and Transpose, Unitary Matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, Orthogonality.

Principles of Quantum Information & Quantum Computing: Introduction to Quantum Computing, Moore's law & its end. Single particle quantum interference, Classical & quantum information comparison. Differences between classical & quantum computing, quantum superposition and the concept of qubit. Properties of a qubit: Mathematical representation. Summation of probabilities, Representation of qubit by Bloch sphere.

Quantum Gates: Single Qubit Gates: Quantum Not Gate, Pauli -Z Gate Hadamard Gate, Pauli Matrices, Phase Gate (or S Gate), T Gate Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of, Swap gate, Controlled-Z gate, Toffoli gate, Numerical problems.

Quantum Computing by Vishal Sahani:Chapter:1- Introduction to Quantum computing

Pre-requisites (Self Learning): Matrices multiplication

RBT Levels: : L1 – Remembering, L2 – Understanding, L3 – Applying,

Module-3:Lasers and Optical Fiber	8 Hours

Lasers: Interaction of radiation with matter, Einstein's coefficients (derivation of expression for energy density). Requisites of a Laser system. Conditions for Laser action. Principle, Construction, and working of semiconductor Lasers. Application of Lasers in Defense (Laser range finder) and Data storage.

Optical Fibers: Propagation mechanism, angle of acceptance, Numerical aperture, Modes of Propagation, Types of optical fibers, Attenuation, and Mention of expression for attenuation coefficient. Discussion of a block diagram of point-to-point communication, Merits and demerits of optical fiber. Optical fiber sensors-displacement. Numerical problems.

Applied Physics for engineers by P K Diwan: Chapter:4- Lasers Chapter: 5 – Optical fiber
Modern Engineering Physics S.L. Guptha and Sanjeev Guptha: 4- Lasers and Holography and Chapter: 5- Fiber Optics

Pre-requisites (Self Learning): Basic mechanism of sensors

RBT Levels:: L1 – Remembering, L2 – Understanding, L3 – Applying,

Module-4: Electrical properties of materials	8 Hours

Electrical Properties: Review of classical free electron theory, limitations of classical free electron theory. Postulates of quantum free electron theory, Density of states (qualitative), Fermi energy, Fermi velocity, Fermi temperature, Fermi factor and its dependence on energy and temperature. Electrical conductivity (qualitative expression using effective mass and Fermi velocity). Merits of quantum free electron theory.

Super Conductors: Introduction to Super Conductors, Temperature dependence of resistivity, Meissner's Effect, Types of Superconductors, Temperature dependence of critical field, BCS theory (Qualitative), High- Temperature superconductivity, Quantum tunnelling, Josephson Junction, SQUIDs (Qualitative),Applications in quantum computing (mention). Numerical problems.

Modern Engineering Physics S.L. Guptha and Sanjeev Guptha: 19-Free electron theory and Chapter: 21-Semiconductor physics
Engineering Physics by SLGuptha and R K Gaur: Chapter: 60-Classifications of solids Wave

Pre-requisites (Self Learning): Concepts of electric current

RBT Levels: : L1 – Remembering, L2 – Understanding, L3 – Applying.

Module-5:Modern Engineering Materials	8 Hours

Nano Materials: Introduction to Nano materials, Surface to volume ratio, Quantum confinement – Quantumwell, Quantum wire, Quantum dot. Carbon Nano tubes, types, properties, Applications.
Transmission Electron Microscopy (TEM), Scanning Electron Microscope (SEM), Application of SEMNumerical problems.

Engineering physics by G. Aruldhas: Chapter16:- Nano technology

Pre-requisites (Self Learning): Properties of materials

RBT Levels:L1 – Remembering, L2 – Understanding, L3 – Applying.

III(b). Practical part

Sl. No.	**Experiments**
1	Measurement of Wavelength of LASER using Diffraction Grating
2	Determination of Numerical Aperture using optical fiber
3	Determination of resistivity of a material using Four Probe Method
4	Measurement of dielectric constant by Charging and Discharging method of a Capacitor

5	Study of Input and output characteristics of a Transistor
6	Study of IV characteristics Photo-Diode
7	Study of frequency response of Series and Parallel LCR Circuits
8	Measurement of Magnetic Field at any point along the axis of a circular coil
9	Determination of Plank's Constant using LEDs.
10	Determination of Fermi Energy of a conductor
11	Determination of unknown components (L.C and R) using Black Box
12	Verification of Stefan's law
13	Particle size determination using LASER source
14	PHET Interactive Simulations

Instructions for conduction of practical part:

Any Ten Experiments must be completed from the list of experiments.

Each experiment to be evaluated for conduction with observation sheet and record writeup. Rubrics for the evaluation of the write-up for experiments designed by the faculty who is handling the laboratory session and is made known to students at the beginning of the practical session.

- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 50 marks.
- Average marks scored by the students from all the experiments are considered.
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct 01 test for 50 marks, test shall be conducted after the completion of prescribed experiments.
- In each test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 80% and the rest 20% for viva-voce.

IV.**COURSE OUTCOMES**

CO1	Discuss the basic principles of Quantum Mechanics and its applications
CO2	Summarize the electrical properties of materials
CO3	Describe the principles of LASERS and Optical fibers and their relevant applications.
CO4	Understand basic concepts of nano science and technology.
CO5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

V.**CO-PO-PSO MAPPING**(mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3	3	-	-	-	-	-	-	-	-	-	2				
CO2	3	3	-	-	-	-	-	-	-	-	-	2				
CO3	3	3	-	-	-	-	-	-	-	-	-	2				
CO4	3	2	1	-	1	-	-	-	-	-	-	2				
CO5	3	2	1	-	2	-	-	-	3	-	-	2				

VI.**Assessment Details (CIE & SEE)**

General Rules: Refer Appendix section 2

Continuous Internal Evaluation (CIE): Refer Appendix section 2

semester End Examination (SEE): Refer Appendix section 2

VII.**Learning Resources**

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
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	Modern Engineering Physics	S.L.Gaur and Sanjeev Gupta	2017	Dhanpat Rai Publications
4	Concepts of Modern Physics	Arthur Beiser	6th Ed; 2006	Tata McGraw Hill Edu Pvt Ltd- New Delhi
5	Fundamentals of Fibre Optics in Telecommunication & Sensor Systems	B.P. Pal	2nd Ed; 2015	New Age International Publishers
6	Quantum Computation and Quantum	Michael A. Nielsen & Isaac L. Chuang	2010 Ed	Cambridge Universities Press
7	Lasers and Non-Linear Optics	B.B. Laud	3rd Ed 2011.	New Age International Publishers
8	LASERS Principles, Types and Applications	K.R. Nambiar	1st Ed; 2004	New Age International Publishers
9	Solid State Physics	S O Pillai	8th Ed -2018	New Age International Publishers
10	Engineering physics	G. Aruldhas	First Ed-2010	Eastern Economy Edition
11	Quantum Computing	Vishal Sahani	2007 Edition.	McGraw Hill Education
12	Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations	Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli,TrendsinLogic,	Volume 48	Springer
VII(b): Reference Books:				
1	Engineering Physics	S P Basvaraju	CBCS edition	Subhas Publications
2	Applied Physics Lab Manual.	Anoop Sing Yadav	1st Ed ,2018	Vayu Education of India
3	Engineering Physics	R K Guptha and R K Gaur	8th Revised-2001	Dhanpat Rai Publications
4	Applied Physics for engineers	P K Diwan	2014	Wiley Publications

VII(c): Web links and Video Lectures (e-Resources):

https://vlab.amrita.edu/?sub=1&brch=282&sim=1512&cnt=1
https://vlab.amrita.edu/?sub=1&brch=282&sim=879&cnt=1
https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1
https://bop-iitk.vlabs.ac.in/basics-of-physics/List%20of%20experiments.html
https://virtuallabs.merlot.org/vl_physics.html
https://phet.colorado.edu
https://www.myphysicslab.com

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Seminar, assignments, quiz, case studies, self-study activities, group discussions

Semester:	I/II	**Course Type:**	IBSC		
Course Title: Chemistry of smart materials					
Course Code:	23CHI12A/22A			**Credits:**	4
Teaching Hours/Week (L: T:P:O)			2:2:2:0	**Total Hours:**	40+Lab slots
CIE Marks:	50	**SEE Marks:**	50	**Total marks:**	100
SEE Type:	Theory			**Exam Hours:**	3

I .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.

III. Teaching-Learning Process (General Instructions):

These are sample strategies, 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
- 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)

III.COURSE CONTENT

III(a). THEORY PART

Module-1:Green Chemistry — **8 Hours**

Green Chemistry: Basic principles of green chemistry -brief discussion on 12 principles of green chemistry. Variousgreen chemical approaches – Microwave synthesis, Bio catalysed reaction (only explanation with examples), Synthesisof typical organic compounds by conventional and green route; Adipic acid – Conventional synthesis from Benzene, Green synthesis from glucose.

Green fuel: Hydrogen-production by electrolysis of water (Alkaline water electrolysis, Proton Exchange Membrane Electrolysis, solid oxide electrolysis)and applications in hydrogen fuel cells. Biodiesel- Preparation and Applications. Construction, working and applications of Methanol-Oxygen fuel cell (H_2SO_4 as electrolyte). Construction and working of solar photovoltaic cell, advantages, and disadvantages.

Textbook:Chapter:sections-An Introductory Text on Green Chemistry by Indu Tucker Sidhwani: Chapter 1,2,4,6:Section 1.1,2.1-2.13,4.5.2-4.5.3,6.2,6.3

Pre-requisites (Self Learning):
Atom economy, Zone refining, Physical and Chemical properties of Si ,doping of Si

RBT Levels:L1,L2,L3

Module-2:Corrosion Science and E-waste Management — **8 Hours**

Corrosion: Introduction, Electrochemical theory of corrosion, Types of corrosion - Differential metal and differential aeration (pitting and water line).Corrosion Penetration Rate (CPR), numerical problems on CPR.

Corrosion Control: Anodizing – Anodizing of aluminium, Cathodic protection - sacrificial anode , Metal coatings – Galvanization. Electroplating-Electroplating of Cr.

E-Waste: Introduction, sources of e-waste, Composition, Characteristics and Need of E-waste management, effects of e-waste on environment and human health, methods of disposal and its advantages. Extraction of copper and gold frome-waste.

Textbook:Chapter:sections

E-Waste ManagementChallenges and Opportunities in India by VarshaBhagat-Ganguly: Chapter 1,4,6: Section 1.1,4.1,6.1

Engineering Chemistry by R V Gadag:Chapter 6:Section:6.3,6.4,6.5,6.6,6.7

Pre-requisites (Self Learning): Organic coatings: Paint, components of paints and their functions. Varnish, definition, differences between paints varnishes. Impact of heavy metals on environment and human health.

RBT Levels: L1,L2,L3

Module-3:Advanced Polymers and Analytical Techniques	**8 Hours**

Polymers: Introduction, Types of polymerizations, molecular weight; number average and weight average, numerical problems. Synthesis and applications of PMMA, epoxy resins, Silicone rubbers.

Conducting Polymers: Introduction: Synthesis and Mechanism of conduction in polyacetylene.

Polymer Composites: Composites: Definition, Reinforcements and matrices, Kevlar Fibre composites (Synthesis, properties and application).

Analytical Techniques: Introduction, principle and instrumentation of Conductometry; its application in the estimation of strong acid and acid mixture. Potentiometry; its application in the estimation of iron. Introduction, principle and instrumentation of Colorimetry; its application in the estimation of Copper sulphate.

Textbook:Chapter: Sections

Engineering Chemistry by R V Gadag: Chapter 7: Section: 7.4,7.5,7.6,7.15,7.16,10..1,10.2,10.3,10.4

Pre-requisites (Self Learning): Classification of polymers, synthesis and application of teflon,nylon 6,6

RBT Levels: L1,L2,L3

Module-4:Sensors and Energy Systems	**8 Hours**

Sensors: Introduction to sensors and transducers. Sensors: types and its applications in modern world. Working principle and applications of Electrochemical sensors, Thermometric sensors and Optical sensors. Sensor for the measurement of Dissolved Oxygen (DO). Electrochemical gas sensors for SOx and NOx. Introduction, properties and applications-Nano sensors.

Energy Systems: Introduction to electrode system and classification. Introduction to batteries, working and types of batteries. Construction, working and applications of Lithium ion battery, Sodium ion battery and flow battery (Vanadium redox flow battery). Concentration cell: Introduction, workingand numerical problems on concentration cell.

Textbook:Chapter:sections –

Sensors and Transducer: Chapter 3,6,8:Section3.1,6.8,8.5

Engineering Chemistry by R V Gadag: Chapter 4: Section: 3.0,3.12,4.1,4.6

Pre-requisites (Self Learning): Types of electrochemical sensor, Gas sensor - O_2 sensor, Biosensor –Glucose sensors**,**derivation of SEP from Nernst equation**,** working of calomel electrode

RBT Levels: L1,L2,L3

Module-5:Materials for Memory and Display Systems	**8 Hours**

Memory Devices: Introduction, Basic concepts of electronic memory, History of organic/polymer electronic memory devices, Classification of electronic memory devices, types of organic memory devices (organic molecules, polymeric materials, organic inorganic hybrid materials).

Display Systems: Photoactive and electroactive materials, 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). Nanomaterials- size dependent properties, synthesis of nanomaterialsby sol-gel technique and Si nanocrystals (properties and application in optoelectronic devices) and Quantum Light Emitting Diodes (QLED's). Quantum Dot Sensitized Solar Cells (QDSSC's) - Principle, Properties and Applications.

Textbook: Chapter: Sections-OLED Display Fundamentals and Applications by TakatoshiTsujimura: Chapter2,3:Section: 2.1,3.1/Engineering analysis of smart material systems: Chapter 1: Section 1.1-1.8

Pre-requisites (Self Learning): Properties and functions of Silicon (Si), Germanium(Ge), Copper(Cu), Aluminium (Al), and Brominated flame retardants in computers.

RBT Levels: L1,L2,L3

III(b). PRACTICAL PART

Sl. No.	Experiments / Programs / Problems
1	Conductometric estimation of acid mixture
2	Potentiometric estimation of FAS using $K_2Cr_2O_7$
3	Determination of pKa of vinegar using pH sensor (Glass electrode)
4	Estimation of Copper present in electroplating effluent by optical sensor (colorimetry)
5	Determination of Viscosity coefficient of lubricant (Ostwald's viscometer)
6	Estimation of total hardness of water by EDTA method
7	Estimation of iron in TMT bar by diphenyl amine/external indicator method
8	Determination of Chemical Oxygen Demand (COD) of industrial waste water sample
9	Estimation of metal in e-waste by optical sensors
10	Determination of glucose by electrochemical sensors

Instructions for conduction of practical part: Instructions for conduction of practical part:

- Strict discipline should be maintained inside the laboratory.
- Lab batches will be allotted at the beginning of the semester.
- Student should enter into the lab by wearing Apron and having the Lab Manual along with a calculator and observation notebook.
- The student should conduct one experiments in the specified time of 2hrs duration in regular lab sessions
- All entries of the observation should be done by using black pen only. Avoid writing by pencil and overwriting
- **The short procedure for the experiment must be prepared for writing in data sheet by the student before coming to the laboratory** All calculations pertaining to the experiments should be completed in the laboratory. The results must be got corrected by the batch teacher only Then entry should be made in the record and also enter the marks in index book before leaving the laboratory.

Please remember that practical records are evaluated during regular class hours. Therefore it is imperative that each student takes care to see that experiments are well conducted and recorded.

IV.COURSE OUTCOMES

CO1	Illustrate the principles of Green chemistry in engineering & technology.
CO2	Understand the basic concepts of corrosion and waste management.
CO3	Apply the knowledge of Advanced Polymers in Engineering Applications
CO4	Develop solutions in the area of Applied materials and Energy systems for Engineering Applications
CO5	Analyse engineering materials to achieve practical solutions.

V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3	1	1	-	-	-	1	1	-	-	-	1				
CO2	3	1	1	-	-	-	1	1	-	-	-	1				
CO3	3	1	1	-	-	-	1	1	-	-	-	1				
CO4	3	1	1	-	-	-	1	1	-	-	-	1				
CO5	3	1	1	-	-	-	1	1	-	-	-	1				

VI.Assessment Details (CIE & SEE)

General Rules: Refer Annexure section 2

Continuous Internal Evaluation (CIE): Refer Annexure section 2

Semester End Examination (SEE): Refer Annexure section 2

VII.Learning Resources

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Green Chemistry: Theory and Practice	Paul T. Anastas, John Charles Warner	01-Jan-2000	Oxford University Press

2	Green Chemistry: Environmentally Benign Reactions	V.K. Ahluwalia	02-Jul-2021	Springer Nature
3	Nanotechnology A Chemical Approach to Nanomaterials	G.A. Ozin& A.C. Arsenault	2005	RSC Publishing
4	Linden's Handbook of Batteries	Kirby W.Beard	Fifth Edition, 2019.	McGraw Hill,
5	Corrosion Engineering	M.G.Fontana, N.D.Greene	3rd Edition, 1996	McGrawHill Publications, NewYork
6	Wiley Engineering Chemistry	Wiley	2nd Edition-2013	Wiley India Pvt.Ltd. NewDelhi
7	Engineering Chemistry	R V Gadag	3rd Edition-2006	I K International house,Pvt.Ltd
VII(b): Reference Books:				
1	Engineering Chemistry	O.G.Palanna	Fourth Reprint 2017	Tata McGraw Hill Education Pvt. Ltd. New Delhi
2	Engineering Chemistry	Shubha Ramesh et.al.	1st Edition, 2011	Wiley India
3	Fundamentals of Analytical chemistry	Douglas A. Skooget.al.	Eighth edition-2004	Thomson Asia pte Ltd
4	OLED Display Fundamentals and Applications	TakatoshiTsujimura	2012	Wiley–Blackwell
5	Super capacitors: Materials, Systems, and Applications	Max Lu, Francois Beguin,ElzbietaFrackowiak	1st edition, 2013	Wiley-VCH

VII(c): 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=PLyhmwFtznRhuz8L1bb3X9IbHrDMjHWWh
https://www.youtube.com/watch?v=j5Hml6KN4TI
https://www.youtube.com/watch?v=X9GHBdyYcyo
https://www.youtube.com/watch?v=1xWBPZnEJk8

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Seminar, Assignments, Quiz, Industry visit, self-study activities, group discussions, etc

Semester:	I/II	**Course Type:**	HSMC		
Course Title: Balake Kannada (Kannada for Usage)					
Course Code:	23BKAH04			**Credits:**	PP/NP
Teaching Hours/Week (L:T:P:O)			1:0:0:0	**Total Hours:**	15
CIE Marks:	50	**SEE Marks:**	-	**Total Marks:**	50
SEE Type:	-			**Exam Hours:**	-

.Course Objective : ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು :

- To create the awareness regarding the necessity of learning local language for comfortable and healthy life .
- To enable learners to Listen and understand the Kannada Language Properly.
- To Speak , Read and Write Kannada Language as per requirement.
- To train the learners for correct and polite conversation.
- To know about Karnataka State and its Language , Literature and General Information about this State.

II.COURSE CONTENT

Module-1	**3 Hours**

1. Introduction, Necessity of learning a local language .Methods to learn the Kannada Language
2. Easy Learning of Kannada Language : A few Tips, Hints for Correct and Polite Conversation , Listening and Speaking activities , Key to Transcription
3. ವೈಯಕ್ತಿಕ , ಸ್ವಾಮ್ಯಸೂಚಕ / ಸಂಭಂದಿತ ಸರ್ವನಾಮಗಳ ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು- Personal Pronouns, Possessive Forms, Interrogative Words

Textbook: Chapter: sections:

Pre-requisites (Self Learning)

RBT Levels:L1, L2

Module-2	**3 Hours**

1. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು ,ಸಂದೇಹಾಸ್ಪದ ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು -Possessive forms of Nouns , Dubitive Question and Relative Nouns.
2. ಗುಣ ಪರಿಣಾಮ 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

Textbook: Chapter: sections:

Pre-requisites (Self Learning)

RBT Levels:L1, L2

Module-3:	**3 Hours**
1. ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು - Dative Cases and Numerals 2. ಸಂಖ್ಯಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal Numerals and Plural Markers. 3. ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು & ವರ್ಣ ಗುಣವಾಚಕಗಳುDefective / Negative Verbs and Colour Adjectives	
Textbook : Chapter: sections:	
Pre-requisites (Self Learning)	
RBT Levels: L1, L2	
Module-4	**3 Hours**
1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ , ನಿರ್ದೇಶನ , ಪ್ರೋತ್ಸಹ ಮತ್ತು ಒತ್ತಾಯ ಅರ್ಥರೂಪ 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 ಕ್ರಿಯಾಪದಗಳು - Helping Verbs “iru” and “iralla” , corresponding Future and Negation Verbs. 4. ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಧ ಸೂಚಕ , ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ - Comparative , Relationship , Identification and Negation Verbs	
Pre-requisites (Self Learning)	
RBT Levels: L1, L2	
Module-5	**3 Hours**
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	
RBT Levels: L1, L2	

III.**COURSE OUTCOMES**

ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಂಶಗಳು : At the end of the course student will ne 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 conversation.
CO5	To know about Karnataka State and its Language , Literature and General Information about this State.

IV.**CO-PO-PSO MAPPING** (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1																
CO2																
CO3																

CO4																
CO5																

V.**Assessment Details (CIE & SEE)**

General Rules: Refer Annexure section 7

Continuous Internal Evaluation (CIE): Refer Annexure section 7

Semester End Examination (SEE): Refer Annexure section 7

VI.**Learning Resources**

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Name of the publisher	Edition and Year
1	Balake Kannada	Dr. Timmesha	Prasaranga, VTU, Belagavi	2018

VII(c): Web links and Video Lectures (e-Resources):

1. **VTU Website**

VIII: Activity Based Learning

Contents related activities (Activity-based discussions)
For active participation of students instruct the students to prepare Flow Charts and Handouts
Organising group wise discussions connecting to placement activities
Quizzes and Discussions
Seminars and Assignments

Semester:	I/II	**Course Type:**	HSMC		
Course Title: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ - ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸ್ಪ ಪಠ್ಯಕ್ರಮ					
Course Code:	23SKAH03			**Credits:**	01
Teaching Hours/Week (L:T:P:O)			1:0:0:0	**Total Hours:**	15
CIE Marks:	50	**SEE Marks:**		**Total Marks:**	50
SEE Type:	Theory			**Exam Hours:**	01

Course Objective: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು :

- ವೃತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ , ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು .
- ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸುವುದು.
- ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
- ತಾ0ತ್ರಿಕಾ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
- ಸಾಂಸ್ಕೃತಿಕ , ಜಾನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಸುವುದು .

I.COURSE CONTENT

ಘಟಕ- 01 ಕನ್ನಡ ಸಂಸ್ಕೃತಿ ಮತ್ತು ಭಾಷೆ ಕುರಿತಾದ ಲೇಖನಗಳು	3 Hours
01. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ - ಹಂಪೆ ನಾಗರಾಜಯ್ಯ 02. ಕರ್ನಾಟಕ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ - ಜಿ ವೆಂಕಟಸುಬ್ಬಯ್ಯ 03. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ - ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ್ ಮತ್ತು ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ	
Textbook: Chapter: sections: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ.	
Pre-requisites (Self Learning)	
RBT Levels:L1, L2	
ಘಟಕ -02 ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ	3 Hours
01.ವಚನಗಳು:ಬಸವಣ್ಣ,ಅಕ್ಕಮಹಾದೇವಿ,ಅಲ್ಲಮಪ್ರಭು,ಆಯ್ದಕ್ಕಿಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ , ಆಯ್ದಕ್ಕಿ ಲಕಮ್ಮ 02. ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ - ಪುರಂದರದಾಸರು 03. ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುತ್ತು- ಶಿಶುನಾಳ ಶರೀಫ	
Textbook: Chapter: sections: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ.	
Pre-requisites (Self Learning)	
RBT Levels:L1, L2	
ಘಟಕ - 03 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ	3 Hours
01. ಡಿ.ವಿ.ಜಿ. ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ದ ಕೆಲವು ಭಾಗಗಳು 02. ಕುರುಡುಕಾಂಚಾಣ : ದಾ. ರಾ ಬೇಂದ್ರೆ 03. ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು	
Textbook : Chapter: sections: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ.	

Pre-requisites (Self Learning)	
RBT Levels: L1, L2	
ಘಟಕ -04 ತಾ0ತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ	3 Hours
01. ಡಾ . ಸರ್ . ಎಂ . ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ. ಎನ್ . ಮೂರ್ತಿರಾವ್ 02. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ ಘಟಕ	
Textbook: Chapter: sections: : ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ	
Pre-requisites (Self Learning)	
RBT Levels: L1, L2	
ಘಟಕ - 05 ಸಾಂಸ್ಕೃತಿಕ , ಜಾನಪದ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ	3 Hours
01. ಯುಗಾದಿ : ವಸುದೇಂದ್ರ 02.ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ . ಚಿ . ಬೋರಲಿಂಗಯ್ಯ	
Textbook: Chapter: Sections: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ	
Pre-requisites (Self Learning)	
RBT Levels: L1, L2	

II.**COURSE OUTCOMES**

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ (23SKAH03) ಪಠ್ಯ ಕಲಿಕೆಯ ನಂತರ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ :

CO1	ಕನ್ನಡ ಭಾಷೆ , ಸಾಹಿತ್ಯ , ಮತ್ತು ಕನ್ನಡ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡುವುದು.
CO2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ ,ಮತ್ತು ಜ್ಞಾನಕೆ ಸ್ಪೂರ್ತಿ ಮೂಡುತ್ತದೆ.
CO3	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಹೆಚ್ಚಾಗುತ್ತದೆ
CO4	ತಾ0ತ್ರಿಕಾ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲ್ಲು ಕೌತುಕಥೆ ಹೆಚ್ಚಾಗುತ್ತದೆ
CO5	ಸಾಂಸ್ಕೃತಿಕ , ಜಾನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

III.**CO-PO-PSO MAPPING** (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1						1				1						
CO2						1				1						
CO3						1				1						
CO4						1				1						
CO5						1				1						

IV.**Assessment Details (CIE & SEE)**

General Rules: Refer Annexure section 7

Continuous Internal Evaluation (CIE): Refer Annexure section 7

Semester End Examination (SEE): Refer Annexure section 7

V.**Learning Resources**

VII(a): Textbooks::

Sl. No.	Title of the Book	Name of the author	Name of the publisher	Edition and Year
1	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ	ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ	ವಿಟಿಯು ಪ್ರಸಾರಾಂಗ	**2018**

VII(c): Web links and Video Lectures (e-Resources):

VIII: Activity Based Learning

Assignments, quiz.

Semester:	I/II	**Course Type:**	HSMC		
Course Title: Professional Skills and English					
Course Code:	23ENGH01			**Credits:**	PP/NP
Teaching Hours/Week (L:T:P:O)			0:1:1:0	**Total Hours:**	30
CIE Marks:	50	**SEE Marks:**	--	**Total Marks:**	50
SEE Type:	-			**Exam Hours:**	--

II.Course Objective

- This course aims at achieving fluency and confidence in spoken and written English.
- Acquiring wide range of vocabulary and linguistic competence that is required for functional performance.
- Building elementary foundations for the knowledge related to conventions and use of language in society, particularly in speaking and listening skills
- Developing the basic skills for creative reading and writing with precision

II.COURSE CONTENT

Module-1: Introduction to Communicative English	Hrs: T/4 L/1

Fundamentals of Communicative English- Barriers to Effective Communication, Different styles in Technical Communication. Interpersonal Communication Skills, Types of communication Interpersonal Communication Skills, Non-Verbal Communication Skills (Body Language), Barrier in communication, how to improve it.
Grammar Focus: Basic English Grammar, Parts of speech.
Activity: Peer- Based Exercises to Ignite conversation. Allow students to interact with each other; talk about their Special Skill, Hobbies and Passion.

Textbook: Chapter: sections: Discussion and coverage of contents as suggested inPART-01: .1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.11, 1.13 of textbook 1.

Pre-requisites (Self Learning): Basics Of Grammar learnt in PUC- Parts of Speech.

RBT Levels:L1, L2 and L3

Module-2: Listening Skills	Hrs: T/4 L/1

Introduction to Phonetics: Sounds and Symbols of vowels, Consonants, Diphthongs, Syllables Silent and Non-Silent letters. Pronunciation of 'The', Homophones and Homonyms.
Importance Of Listening: Difference between Hearing and Listening, Active Listening, Types of Listening, Barriers in Listening, Note taking, Active response, Empathy and Perspective- taking, Building Listening Habits.
Activity: Scenario – Based Activity

Textbook: Chapter: sections: Discussion and coverage of contents in **Part -02**: 7.1, 7.2, 7.6, 8.7. **Part-03**: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12 of textbook 01.

Pre-requisites (Self Learning): Audio Track listening such as Podcasts, Audio Books, Language Learning to improve Pronunciation , Comprehension and over all Language Skills.

RBT Levels:L1, L2 and L3

Module-3: Introduction to Speaking Skills	Hrs: T/4 L/1

Developing Vocabulary, Paraphrasing conversations, Paraphrasing content, Common Errors in Pronunciation. Importance of Non verbal communication [Body Language, Para linguistic features] Presentations on a various themes by organizing a larger unit of discourse and giving information and Expressing opinions, Group Discussions: Significance of GD and Do's & Don'ts. Assertive Communication skills, Answering to the Point following 7C's of communication.Extempore and Public Speaking.
Grammar focus: Reported Speech, Voice, One -word Substitution, Prefix and Suffix.
Activity: GD

Textbook : Chapter: sections: Discussion and coverage of contents in
Part- 04: 10.1, 10.2, 10.3, 11,1, 11.2, 11.3, 12, 13 of textbook 01.

Pre-requisites (Self Learning)
Basic English Grammar, Pronunciation, Speaking on general topics

RBT Levels: L1, L2 and L3

Module-4: Introduction to Reading Skills Hrs: T/4 L/1

Types of reading [Skimming, and Scanning, Extensive and intensive reading], Oral skills with emphasis on conversational practice. Reading Comprehension. Analytical and Comparative Reading, Usage of Dictionary.
Reading Job advertisements, understanding Job specifications, requirements in application form [Job or for higher studies].
Grammar focus: Subject verb agreement, use of Active verbs, Sequence of Tenses.
Activity: Book review [Fiction& Non- Fiction], News Paper article reading, Magazine and Journals review.

Textbook: Chapter: sections: : Discussion and coverage of contents
inPART-05: 17.1, 17.2, 17.3, 17.7, 17,8, 17.9, 17.10, of textbook 01.

Pre-requisites (Self Learning): Basic Reading skills.

RBT Levels: L1, L2 and L3

Module-5: Introduction to Writing Skills Hrs: T/4 L/1

Techniques in Paragraph Writing, Organizing Principles of Paragraphs in Documents, Reportwriting; Long and Short, Punctuations, Emails, Blog writing, Resume and Cover Letter writing.
Grammar focus : Misplaced Modifiers, Idioms and Phrases
Activity: Students write a short Article and Report on Recent Technological Innovations.

Textbook: Chapter: Sections: Discussion and coverage of contents in
Part-06: 20, 20.1, 20.2, 20.3, 20.4, 22.7, 23.5, 23.13, 25.1, 25.2, 25.3, 25.6, of textbook 01.

Pre-requisites (Self Learning): Basic English Grammar, Vocabulary.

RBT Levels: L1, L2 and L3

III.COURSE OUTCOMES

CO1	Develop the ability to speak English language with the right way of pronunciation.
CO2	Practice listening effectively to communication in English.
CO3	Express the viewpoints with confidence in English.
CO4	Implement English vocabulary at command and language proficiency.
CO5	Perform well in campus recruitment, engineering and all other general competitive examinations.

IV.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1									2	2						
CO2									2	2						
CO3									2	2						
CO4									2	2						
CO5										2						

V.Assessment Details (CIE & SEE)

General Rules: Refer Annexure Section 7

Continuous Internal Evaluation (CIE): Refer Annexure Section 7

Semester End Examination (SEE): Refer Annexure Section 7

VI.**Learning Resources**

VII(a): Textbooks:

Sl. No.	Title of the Book	Name of the author	Name of the publisher	Edition and Year
1	Communication Skills	Sanjay Kumar Puspa Latha	Oxford University Press	02th Ed., 2015.

VII(b): Reference Books: (Insert or delete rows as per requirement)

1	How to Analyze People: The Ultimate Guide to Speed Reading People Through Proven Psychological Techniques, Body Language Analysis and Personality Types and Patterns	Sebastian	Oxford English Dictionary Croft	02nd Ed., 2018
2	English Grammar	Krishnaswamy, Subashree .	New York: Cambridge University Press.	04th Ed., 2018

VII(c): Web links and Video Lectures (e-Resources):

Semester:	I/II	**Course Type:**	HSMC		
Course Title: Constitution of India and Professional Ethics					
Course Code:	23CIPH05			**Credits:**	1
Teaching Hours/Week (L:T:P)			1:0:0:0	**Total Hours:**	15
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	2

I. Course Objectives:

The course Indian Constitution will enable the students,

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

II. Teaching-Learning Process (General Instructions):

The pedagogy shall involve the combination of different methodologies which suit modern technological tools. (i) Direct instructional method (ii) Advanced Technological tools (iii) Enquiry and evaluation based learning (iv) Personalized learning
Apart from conventional lecture methods, various types of innovative teaching techniques through videos may be adapted so that the delivered lesson can progress the students.

III. COURSE CONTENT

Module-1: Indian Constitution	3 Hours

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. Salient features of India Constitution. The Preamble of Indian Constitution & Key concepts of the Preamble. Salient features of India Constitution.
Text Book: "Introduction to the Constitution of India", (Students Edition.) by Durga Das Basu.
RBT Levels: L1, L2

Module-2: FR's, FD's and DPSP's	03 Hours

FR's, FD's and DPSP's: Fundamental Rights and its Restriction and limitations in different Complex Situations. Directive Principles of State Policy (DPSP) and its present relevance in our society with examples. Fundamental Duties and its Scope and significance in Nation building.
Text Book: "Constitution of India" by M V Pylee.
RBT Levels: L1, L2

Module-3: Union Executive	3 Hours

Union Executive: Parliamentary System, Union Executive – President, Prime Minister, UnionCabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism.

Text Book: "Introduction to the Constitution of India", (Students Edition.) by Durga Das Basu.

RBT Levels: L1, L2

Module-4: State Executive & Elections	3 Hours

State Executive & Elections, Amendments and Emergency Provisions: State Executive, Election Commission, Elections & Electoral Process. Amendment to Constitution (How and Why) and Important Constitutional Amendments till today. Emergency Provisions.**Text Book:** "Constitution of India" by M V Pylee.

RBT Levels: L1, L2

Module-5: Professional Ethics	3 Hours

Professional Ethics: Ethics & Values. Types of Ethics. Scope & Aims of Professional & Engineering Ethics. Positive and Negative Faces of Engineering Ethics. Clash of Ethics, Conflicts of Interest. The impediments to Responsibility. Trust & Reliability in Engineering, IPRs (Intellectual Property Rights), Risks, Safety and liability in Engineering

Text Book: "Engineering Ethics", M.Govindarajan, S.Natarajan, V.S.Senthilkuma

RBT Levels: L1, L2

IV.COURSE OUTCOMES

CO1	Analyse the basic structure of Indian Constitution.
CO2	Outline the Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
CO3	Extend knowledge about Union and State Government, Elections system of India & Amendments.
CO4	Outline the importance of Engineering Ethics

V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3					2						3				
CO2	3					2						3				
CO3	3					2						3				
CO4	3					2		3				3				

VI.Assessment Details (CIE & SEE)

General Rules: Refer Annexure Section 6

Continuous Internal Evaluation (CIE): Refer Annexure Section 6

Semester End Examination (SEE): Refer Annexure Section 6

VII.Learning Resources

VII(a): Textbooks

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1.	"Introduction to the Constitution of India"	Durga Das Basu	Students Edition, 2008	Prentice –Hall
2.	"Engineering Ethics"	M.Govindarajan, S.Natarajan, V.S.Senthilkumar	2004	Prentice –Hall

VII(b): Reference Books

1	"Constitution of India, Professional Ethics and Human Rights"	Shubham Singles, Charles E. Haries, and et al.	Latest Edition – 2019	Cengage Learning India
2	"Constitution of India"	M V Pylee	16th Edition	Vikas Publication

VII(c): Web links and Video Lectures (e-Resources):

https://www.studyiq.com/articles/important-articles-of-the-indian-constitution/
https://byjus.com/free-ias-prep/constitution-of-india-an-overview/

VIII: Activity Based Learning / Practical Based Learning/Experiential 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

Semester:	I/II	**Course Type:**	HSMC		
Course Title: Environmental Studies					
Course Code:	23ENVH02			**Credits:**	01
Teaching Hours/Week (L:T:P)			1:0:0:0	**Total Hours:**	15
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory			**Exam Hours:**	2

I. Course Objectives:

- To create environmental awareness among the students.
- To gain knowledge on different types of pollution in the environment.

II .Teaching-Learning Process (General Instructions):

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

1. Apart from conventional lecture methods various types of innovative teaching techniques through videos, and animation films may be adopted so that the delivered lesson can progressthe students in theoretical, applied and practical skills.
2. Environmental awareness program for the in-house campus
3. Encourage collaborative (Group Learning) Learning in the class.
4. Seminars, surprise tests and Quizzes may be arranged for students in respective subjects to develop skills.

III.COURSE CONTENT

Module-1	3 Hours

Introduction to Environmental Studies: Introduction: Environment - Components of Environment Ecosystem: Types & Structure of Ecosystem, Balanced ecosystem Human Activities – Food, Shelter, And Economic & Social Security.
Impacts of Agriculture & Housing Impacts of Industry, Mining & Transportation Environmental Impact Assessment, Sustainable Development.
Textbook: Bharucha, E. (2015). Textbook of Environmental Studies
RBT Levels: L1, L2

Module-2	3 Hours

Natural Resources: Water resources – Availability & Quality aspects, Water borne diseases & water induced diseases, Fluoride problem in drinking water Mineral resources, Forest Wealth Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle.
Energy – Different types of energy, Conventional sources & Non Conventional sources of energy Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas Fossil Fuels, Hydrogen as an alternative energy.
Textbook: "Environmental Studies", by Benny Joseph
RBT Levels: L1, L2

Module-3	3 Hours

Environmental Pollution (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution.
Waste Management & Public Health Aspects: Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes; Industrial and Municipal Sludge.
Textbook: Environmental Science- Principles and Practices, by Das R.C
RBT Levels: L1, L2

Module-4	3 Hours

Global Environmental Concerns (Concept, policies and case-studies): Ground wate depletion/recharging, Climate Change; Acid Rain; Ozone Depletion; Radon and Fluoride probler in drinking water; Resettlement and rehabilitation of people, Environmental Toxicology.

Textbook: "Environmental Studies – From Crisis to Cure" by R Rajagopalan

RBT Levels: L1, L2

Module-5	3 Hours

Latest Developments in Environmental Pollution Mitigation Tools (Concept an Applications): G I S. &Remote Sensing, Environment Impact Assessment, Environmenta Management Systems, ISO14001; Environmental Stewardship- NGOs.

Field work: Visit to an Environmental Engineering Laboratory or Green Building or Wate Treatment Plant or Waste water treatment Plant; ought to be Followed bv understanding o processand its brief documentation

Textbook: Environmental and Pollution Science. Pepper I.L., Gerba C.P. & Brusseau M.L.

RBT Levels: L1, L2

IV.**COURSE OUTCOMES**

CO1	To identify the major challenges in environmental issues and evaluate possible solutions.
CO2	Develop analytical skills, critical thinking and demonstrate socio-economic skills for sustainable development.
CO3	To analyze an overall impact of specific issues and develop environmental management plan.

V.**CO-PO-PSO MAPPING** (mark H=3; M=2; L=1)

PO /PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	3					2						2				
CO2	3	2					2					2				
CO3	3	2				2	2					2				

VI.**Assessment Details (CIE & SEE)**

General Rules: Refer Annexure Section 6

Continuous Internal Evaluation (CIE): Refer Annexure Section 6

Semester End Examination (SEE): Refer Annexure Section 6

VII.**Learning Resources**

VII(a): Textbooks

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Textbook of Environmental Studies	Bharucha, E.	(2015)	-
2	Environmental Studies	Benny Joseph	2nd Edition, 2012	Tata Mc Graw – Hill.
3	Environmental Studies – From Crisis to Cure	R Rajagopalan	2005	Oxford Publisher
4	Environmental Science-Principles and Practices	Das, R.C.	2008	I Ed., Printice Hall of India,New Delhi.
5	Environmental and Pollution Science.	Pepper, I.L., Gerba, C.P. & Brusseau, M.L.	2006	Elsevier Academic Press.

VII(b): Reference Books				
1	Principals of Environmental Science and Engineering	Raman Sivakumar	2nd Edition, 2005	Cengage learning, Singapur.
2	Fundamentals of Ecology.	Odum, E.P., Odum, H.T. & Andrews, J.	1971	-
3	Environmental Pollution and Control	Vesilind, P.J., Peirce, J.J., & Weiner R.F	1990.	.Butterworth-Heinemann, USA
VII(c): Web links and Video Lectures (e-Resources):				
https://www.youtube.com/watch?v=or-z0Q03pcY https://www.youtube.com/watch?v=qS8mfAX1tAk				
VIII: Activity Based Learning / Practical Based Learning/Experiential learning:				

Semester:	I	**Course Type:**	NCMC		
Course Title: Skills for Success: An approach to Aptitude and Soft Skills					
Course Code:	23PDSN01			**Credits:**	PP/NP
Teaching Hours/Week (L:T:P:O)			0:0:0:2	**Total Hours:**	24
CIE Marks:	50	**SEE Marks:**	----	**Total Marks:**	50
SEE Type:	----------			**Exam Hours:**	00

I. Course Objectives:

- Explore techniques to boost self-esteem and overcome self-doubt
- Learn effective techniques for structuring and delivering presentations
- Recognizing the Role of Aptitude in Placement
- Learn to express thoughts and ideas clearly and confidently.
- Improve overall language proficiency and grammatical accuracy.

II. 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) need not to be only a traditional lecture method, but alternative effective Teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical Thinking.
5. Adopt Problem Based Learning (PBL), which fosters students Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather Than simply recall it.
6. Introduce Topics in manifold representations.
7. Show the different ways to solve the same problem with different circuits/logic 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.

III. COURSE CONTENT

III(a).Theory PART

Module-1: Personality Development and Presentation skills	05 Hrs
Self-Introduction Tips, Ways to Improve Self Confidence, Art of Story Telling and presentation Skills, Five beats of storytelling, Activity(Story narration by students) and basics of presentation slides making, Body language and postures.	
Pre-requisites: Emotional intelligence and self-awareness	
Module-2: Overview of Problems on Number series and Simplification	05 Hrs

Aptitude concept**,** Basic idea on how Aptitude helps in getting placed, What are the benefits in learning Aptitude, Basic Vedic Maths Techniques, Problems on Number series and puzzles, Problems on Simplification.

Pre-requisites: Basic mathematics

Module-3: Public Speaking and Etiquettes	04Hrs

Art of improving Communication skills, Public Speaking, Stage Presence, Formal dressing, Networking**,** Etiquettes, Campus Interview and Portfolio, Business Etiquettes, Meeting Etiquettes, Social Etiquettes**.**

Pre-requisites Basic Communication Skills

Module-4: Grammar and Verbal Aptitude	06Hrs

Articles, Prepositions and Spotting the Errors, Verbal aptitude concept, Problems on seating arrangement, Activity (Team Building).

Pre-requisites: Basic grammar

Module-5: Reasoning	04Hrs

Data sufficiency and Assessment

Pre-requisites: Basic mathematical Knowledge

IV. COURSE OUTCOMES

CO1	To improve verbal ability skill and communicative skill of the students
CO2	To improve verbal ability skill and communicative skill of the students
CO3	Students will communicate effectively & appropriately in real life situation
CO4	It will enhance students problem-solving skill.
CO5	Students will be able to prepare for various public and private sector exams & placement drives.

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	2							2		2		1				
CO2	2							2		2		1				
CO3	2							2		2		1				
CO4	2							2		2		1				
CO5	2							2		2		1				

VI. Assessment Details (CIE)

Continuous Internal Evaluation (CIE):

- CIE will be conducted as per the scheduled timetable, with common question papers for the subject.
- The question paper will have 50 questions. Each question is set for 01 mark.
- CIE Pattern will be in MCQ Model (Multiple Choice Questions) for 50 marks. The duration of the examination is 01 Hour.

VII. Learning Resources

VII(b): Reference Books:

1	The power of habit	CHARLES DUHIGG'S BLOG	2007	Good readers
2	Never Split the Difference:	Chris Voss	2015	Good readers

	Negotiating as if Your Life Depended on It			
3	Thinking, Fast and Slow Hardcover	Daniel Kahneman	2011	Good readers

VII(c): Web links and Video Lectures (e-Resources):

https://swayam.gov.in/explorer
https://nptel.ac.in/courses
https://youtu.be/6B-dvOMTeV8?si=Mx0GqAVqjh6VtDRP
https://youtu.be/MFj7QIXn-mM?si=AQlxLi086k1GrJuk

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Mention suggested Activities like

- Seminar
- Assignments
- Quiz
- Mini projects
- Activity Based learning

Semester:	II	**Course Type:**	NCMC		
Course Title: Skilful Harmony: Bridging Aptitude and Soft skills					
Course Code:	23PDSN02			**Credits:**	PP/NP
Teaching Hours/Week (L: T: P: O) {O – Other pedagogies, mention @}			0:0:0:2	**Total Hours:**	24
CIE Marks:	50	**SEE Marks:**	----	**Total Marks:**	50
SEE Type:	----------			**Exam Hours:**	00

I. Course Objectives:

- Demonstrate the ability to write clear, concise, and grammatically correct messages.
- Craft comprehensive curriculum vitae (CV) suitable for academic and professional pursuits.
- Apply problem-solving strategies to real-world situations.
- Collaborate effectively with peers in group activities and projects.
- Develop a systematic approach to creative problem solving

II. 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) need not to be only a traditional lecture method, but alternative effective Teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical Thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather Than simply recall it.
6. Introduce Topics in manifold representations.
7. Show the different ways to solve the same problem with different circuits/logic 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.

III. COURSE CONTENT

III (a). Theory PART

Module-1: Quantitative Aptitude	06 Hrs
Problems on HCF and LCM, Speed time and distance, clocks and calendars	
Pre-requisites: Basic mathematics	

Module-2:(Verbal communication and Hand writing skills)	04 Hrs
Written and oral communication, Resume and CV building, Hand writing skills, Technical writing skills.	
Pre-requisites : Basic Communication	
Module-3: Logical reasoning and Puzzles	06 Hrs
Vocabulary reasoning, Logical deduction, Cross word puzzles, Activity (Bridge Building Challenge/Code Debugging Challenge)	
Pre-requisites : Language proficiency and Basic logic skills	
Module-4: Team Building and Team work	04 Hrs
Essentials of team building, Responsibility, Collaboration, Coordination, Activity (Marshmallow Challenge)	
Pre-requisites: Effective communication and Collaboration skills	
Module-5: Brain storming and Assessment	04 Hrs
Individual Brainstorming, Group, Brainstorming, Stepladder Technique, Crawford Slip writing approach, Reverse brainstorming, Star bursting, Round robin brainstorming and Final Assessment	
Pre-requisites: Willingness to explore new creative ideas	

IV. COURSE OUTCOMES

CO1	To improve verbal ability skill and communicative skill of the students
CO2	To improve verbal ability skill and communicative skill of the students
CO3	Students will communicate effectively & appropriately in real life situation
CO4	It will enhance students problem solving skill.
CO5	Students will be able to prepare for various public and private sector exams & placement drives.

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1	2							2		2		1				
CO2	2							2		2		1				
CO3	2							2		2		1				
CO4	2							2		2		1				
CO5	2							2		2		1				

VI. Assessment Details of CIE

Continuous Internal Evaluation (CIE):

- CIE will be conducted as per the scheduled timetable, with common question papers for the subject.
- The question paper will have 50 questions. Each question is set for 01 mark.
- CIE Pattern will be in MCQ Model (Multiple Choice Questions) for 50 Marks. The duration of the examination is 01 Hour.

VII. Learning Resources

VII(b): Reference Books:

1	The power of habit	CHARLES DUHIGG'S BLOG	2007	**Good readers**

2	Never Split the Difference: Negotiating as if Your Life Depended on It	Chris Voss	2015	**Good readers**
3	Thinking, Fast and Slow Hardcover	Daniel Kahneman	2011	**Good readers**

VII(c): Web links and Video Lectures (e-Resources):

https://swayam.gov.in/explorer
https://nptel.ac.in/courses
https://youtu.be/6B-dvOMTeV8?si=Mx0GqAVqjh6VtDRP
https://youtu.be/MFj7QIXn-mM?si=AQlxLi086k1GrJuk

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Mention suggested Activities like

- Seminar
- Assignments
- Quiz
- Mini projects
- Activity Based learning

Semester:	I	**Course Type:**	AEC		
Course Title: WEB 2.0 (HTML, CSS & JAVASCRIPT) {Skill Development Course-1 (EWDP)}					
Course Code:	23CSAE11			**Credits:**	1
Teaching Hours/Week (L:T:P:O)		0:1:1:1		**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory/practical/other assessment(practical)			**Exam Hours:**	02

I. Course Objectives:

- Learn Web tool box and history of web browsers
- Learn HTML, XHTML tags with utilizations.
- Know CSS with dynamic document utilizations.
- Learn JavaScript with Element access in JavaScript
- Logically plan and develop web pages..

II. 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) need not to be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analysed information rather than simply recall it.
6. Introduce Topics in manifold representations.
7. Show the different ways to solve the same problem with different circuits/logic 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.

III. COURSE CONTENT

Module-1	8 Hours

Introduction to Web Programming: Internet, WWW, Web Browsers, and Web Servers, URLs, MIME, HTTP, Security, The Web Programmers Toolbox.

Textbook 1: Chapter 1 (1.1 to 1.9)

Pre-requisites (Self Learning)

RBT Levels: L1 and L2	
Module-2:	8 Hours
HTML and XHTML : Origins of HTML and XHTML, Basic syntax, Standard XHTML document structure, Basic text markup, Images, Hypertext Links, Lists, Tables , Frames , HTML Color ,HTML Attributes ,. Forms, Frames in HTML and XHTML, Syntactic differences between HTML and XHTML. Textbook 1 : Chapter 2 (2.1 to 2.10)	
Pre-requisites (Self Learning) : HTML	
RBT Levels:L1 , L2	
Module-3:	8 Hours
CSS: Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, Background images, tags. Textbook 1 : Chapter 3 (3.6 to 3.12)	
Pre-requisites (Self Learning) ; HTML	
RBT Levels: L2 , L3	
Module-4:	8 Hours
Java Script – I: Object orientation and JavaScript; General syntactic characteristics; Primitives, Operations, and expressions; Screen output and keyboard input. Reference Book : Chapter 4(4.1 to 4.5)	
Pre-requisites (Self Learning) : HTML and CSS	
RBT Levels: L2 , L3	
Module-5:	8 Hours
Java Script – II: Control statements, Object creation and Modification; variables , data types Arrays; Functions; Constructor; Pattern matching using expressions; Errors, Element access in JavaScript DOM and BOM Objects . Text Book 1 : Chapter 4(4.6 to 4.14)	
Pre-requisites (Self Learning) :	
RBT Levels: L3	

IV. COURSE OUTCOMES

CO1	Describe the fundamentals of web and concept of HTML.
CO2	Use the Concepts of HTML , XHTML to construct the web pages .
CO3	Interpret CSS for Dynamic Documents.
CO4	Evaluate different concepts of JS and Construct Dynamic Documents
CO5	Design a small project using HTML ,CSS and JavaScript

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	PS1	PS2	PS3	PS4
CO1	2		2		2											
CO2	2		2		2											
CO3	2		2		2											

CO4	2		2		2											
CO5	2		2		2											

VI. Assessment Details (CIE & SEE)

General Rules: Refer appendix section 5

Continuous Internal Evaluation (CIE): Refer appendix section 5

Semester End Examination (SEE): Refer appendix section 5

VII. Learning Resources

VII(a): Text Books

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	**Programming the World Wide Web**	**Robert W Sebesta**	**6th Edition, 2008**	**Pearson Education**

VII(b): Reference Books

Sl. No.	Title of the Book	Name of the author	Edition and Year	Name of the publisher
1	Castro	Elizabeth and Hyslop	Eight Edition And 2013	Peach pit Press
2	Basics of Web Design	Felke-Morris	Fifth Edition And 2019	Pearson Education
3	Beginning HTML5 Media	Silvia, and Green Tom	First Edition And 2015	Apress

VII(c): Web links and Video Lectures (e-Resources):

Introduction to web Development :
https://www.youtube.com/watch?v=l1EssrLxt7E&list=PLfqMhTWNBTe3H6c9OGXb5_6wcc1Mca52n
Introduction to HTML , CSS , Java Script :
https://www.youtube.com/watch?v=6mbwJ2xhgzM&list=PLu0W_9lII9agiCUZYRsvtGTXdxkzPyItg
Tutorial Link:
1. http://www.tutorialspoint.com
2. http://www.w3schools.com

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Demonstration of Simple Projects

|| Jai Sri Gurudev ||
Sri Adichunchanagiri Shikshana Trust (R)
SJB Institute of Technology
BGS Health and Education City, Dr. Vishnuvardhana Road, Kengeri, Bengaluru-560060
Approved by AICTE, New Delhi.
Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi
Accredited by NAAC with 'A+'grade, Certified by ISO 9001 - 2015
Recognized by UGC, New Delhi with 2(f) & 12 (B)

Semester:	II	**Course Type:**	AEC		
Course Title: INTRODUCTION TO PYTHON PROGRAMMING {Skill Development Course-2 (EWDP)}					
Course Code:	23CSAE21			**Credits:**	1
Teaching Hours/Week (L:T:P:O)			0:1:1:1	**Total Hours:**	40
CIE Marks:	50	**SEE Marks:**	50	**Total Marks:**	100
SEE Type:	Theory/practical/other assessment(practical)			**Exam Hours:**	02

I. Course Objectives:

- Learn the syntax and semantics of the Python programming language.
- Illustrate the process of structuring the data using lists, tuples.
- Demonstrate the use of built-in functions to navigate the file system.
- Implement the Object-Oriented Programming concepts in Python.

II. 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) need not to be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analysed information rather than simply recall it.
6. Introduce Topics in manifold representations.
7. Show the different ways to solve the same problem with different circuits/logic 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.

III. COURSE CONTENT

Module-1	8 Hours

Python Basics: Difference between basic programming Language and Python, Python History, Python Operators and Operator Precedence, Keywords & Identifier, Statements & Comments, Python Data types.

Lists: The List Data Type, Working with Lists, Augmented Assignment Operators, Methods,

Example.

Dictionaries and Structuring Data: The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things.

Textbook 1: Chapter 1-3

Pre-requisites (Self Learning)

RBT Levels: L1 and L2

Module-2:	8 Hours

Flow control: Python if...else, Python for and while Loop, break, Continue and Pass Statement.

Functions: def Statements with Parameters, Return Values and return Statements,The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling.

Textbook 1 : Chapter 2 (2.1 to 2.1

Pre-requisites (Self Learning) : HTML

RBT Levels:L1 , L2

Module-3:	8 Hours

Manipulating Strings: Working with Strings, Useful String Methods.

Exception Handling: Common Exceptions, User-defined Exception Declaring multiple Exception, Raising Exception, Python Directory.

Textbook 1 : Chapter 6, 8

Pre-requisites (Self Learning) ; HTML

RBT Levels: L2 , L3

Module-4:	8 Hours

File handling: Reading from a file, writing to a file, Reading and writing CSV file Reading and writing Excel file, Python Classes, Python Objects, Operator Overloading.

Python Modules: Create Module and Standard module.
Textbook 1: Chapter 9-10

Pre-requisites (Self Learning) : HTML and CSS

RBT Levels: L2 , L3

Module-5:	8 Hours

Classes and objects: Inheritance, Multiple Inheritance, Python Namespace, Programmer-defined types.

Classes and methods: Object-oriented features, Printing objects, Another example, A more complicated example,Theinit method, The__str__ method, Operator overloading, Type-based dispatch.

Text Book 2 : Chapter 15-17

Pre-requisites (Self Learning) :

RBT Levels: L3

IV. COURSE OUTCOMES

CO1	Demonstrate proficiency in handling loops and creation of functions.
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.
CO3	Develop programs for string processing and file organization
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
CO5	Design a small project using HTML ,CSS and JavaScript

V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)

PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	PS1	PS2	PS3	PS4
CO1	2		2		2											
CO2	2		2		2											
CO3	2		2		2											
CO4	2		2		2											
CO5	2		2		2											

VI Learning Resources

1. Al Sweigart,**"Automate the Boring Stuff with Python",** 1st Edition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at https://automatetheboringstuff.com/)
(Chapters 1 to 18, except 12) for lambda functions use this link: https://www.learnbyexample.org/python-lambda-function/
2. Allen B. Downey, **"Think Python: How to Think Like a Computer Scientist",** 2nd Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at http://greenteapress.com/thinkpython2/thinkpython2.pdf
(Chapters 13, 15, 16, 17, 18) (Download pdf/html files from the above link)

VII(c): Web links and Video Lectures (e-Resources):

- Introduction to web Development :
- https://www.learnbyexample.org/python/
- https://www.learnpython.org/
  https://pythontutor.com/visualize.html#mode=edit

VIII: Activity Based Learning / Practical Based Learning/Experiential learning:

Demonstration of Simple Projects Quizzes for list, tuple, string dictionary slicing operations using below link https://github.com/sushantkhara/Data-Structures-And-Algorithms-with-Python/raw/main/Python%203%20_%20400%20exercises%20and%20solutions%20for%20beginners.pdf

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Approved by AICTE, New Delhi.
Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi
Accredited by NAAC with 'A+'grade, Certified by ISO 9001 - 2015
Recognized by UGC, New Delhi with 2(f) & 12 (B)

CIE & SEE Evaluation strategy for Autonomous Scheme 2023 (Tentative)

Sl. No.	Course Type /Credits	Continuous Internal Evaluation (CIE)																	Semester End Examination (SEE)								Total Marks (CIE+SEE)
		Total CIE marks	Min. Eligty.	I. Theory Component							II. Practical Component								Total CIE marks	Dur. In hrs.	Theory			Practical			Total SEE marks	
				Marks	Min. Eligty.	A. Unit test		B. Formative Assessments		Tot. Theory marks (I)	Marks	Min. Eligty.	C. Weekly Evaluation		D. Internal Test			Tot. marks (II)			Max. cond. marks	Max. considered marks	min. pass %	Max. cond. marks	Max. considered marks	min. pass %		
						Nos.	Marks / Each	Nos.	Marks/ Each				Each week	Tot. marks	Nos.	Marks/ Each	Total marks											
1	**BSC/ESC/PCC/ETC/ PEC/OEC (3 or 4 Credit courses)**	50	50%	50	50%	3	50	2	50	50 (avg. of 5)	--	--	--	--	--	--	--	--	50 (I)	03	100	50	40%	--	--	--	50	100
2	**IBSC/IESC/IPCC (4 Credit courses)**	50	50%	50	50%	3	50	--	--	50 (avg. of 3)	50	50%	50	50 (Avg. of all)	1	50	50	50 (Avg. of C & D)	50 (Avg. of I & II)	03	100	50	40%	--	--	--	50	100
3	**IESC - CAED (4 credit course)**	50	50%	--	--	--	--	--	--	--	50	50%	50	50 (Avg. of all)	1	50	50	50 (Avg. of C & D)	50	03	--	--	--	100	50	40%	50	100
4	**PCCL (1 Credit courses)**	50	50%	--	--	--	--	--	--	--	50	50%	50	50 (Avg. of all)	1	50	50	50 (Avg. of C & D)	50 (II)	03	--	--	--	100	50	40%	50	100
5	**AEC**- IDT, Skill Development courses **(1 credit course)**	50	50%	50	50%	2	50	1	50	50 (Avg. of 3)	--	--	--	--	--	--	--	--	50 (I)	02	50	50	40%	--	--	--	50	100
6	**HSMC**- CIP, Env studies, SFH, UHV **(1 credit course)**	50	50%	50	50%	2	50	1	50	50 (Avg. of 3)	--	--	--	--	--	--	--	--	50 (I)	02	50	50	40%	--	--	--	50	100
7	**HSMC -** English, Kannada **(No credits)**	50	50%	50	50%	2	50	1	50	50 (Avg. of 3)	--	--	--	--	--	--	--	--	50 (I)	--	--	--	--	--	--	--	--	50
8	**NCMC -** Personality Development courses, PE, Yoga, NCC, NSS, IKS **(No credits)**	50	50%	50	50%	--	--	1	50	50	--	--	--	--	--	--	--	--	50 (I)	--	--	--	--	--	--	--	--	50

Formative (Successive) Assessments: Assignments/quiz/ seminars/field survey and report presentation/course project/etc. based on the faculty & dept. planning

Practical Conduction: The conduction of each experiment/program per week should evaluate for 50 Marks and average of all shall be taken.

In case of Integrated course, minimum eligibility shall be attained as prescribed in both the theory and practical components.

Self Learning Courses (SLC) Courses, Internship, Mini project & Major Project: Rubrics & Methodology shall be defined seperately

CIE and SEE guidelines based on course Type for Autonomous Scheme 2023

Note:

- **The CIE conduction coordination will be done by the office of Controller of Examination (COE).**
- **The SEE will be conducted by the office of Controller of Examination (COE).**

Continuous Internal Evaluation (CIE)	Semester End Examination (SEE)	Final Passing requirement
1. BSC/ESC/PCC/ ETC/PEC/OEC – Theory Course (03 & 04 Credit courses)		
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 50% of the maximum marks (25 marks out of 50). **Continuous Internal Evaluation:** CIE will be conducted by the department and it will have only 01 component: **I. Theory component.** Theory Component will consist of A. Internal Assessment Test B. Formative assessments **A. Internal Assessment Test:** • There are 03 tests each of 50 marks conducted during 6th week, 10th week & 15th week, respectively.	The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks). **Semester-End Examination:** Duration of 03 hours and total marks of 100. • The question paper will have ten questions. Each question is set for 20 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.	The student is declared as a pass in the course if he/she secures a minimum of 45% (45 marks out of 100) in the sum total of the CIE and SEE taken together.

• The question paper will have four questions (max of 3 sub questions) from the notified syllabus. Each question is set for 25 marks. • The student have to answer 2 full questions (one from 1st & 2nd questions and another from 3rd & 4th question). • Internal Assessment Test question paper shall be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course. **B. Formative assessments:** • 02 formative assessments each of 50 marks shall be conducted by the course coordinator based on the dept. planning during random times. • One formative assessment shall be completed before 5th week and second shall be completed before 12th week. • The syllabus content for the formative assessment shall be defined by the course coordinator. • The formative assessments include Assignments/ Quiz/ seminars/case study/field survey/ report presentation/ course project/etc. • The assignment QP or Quiz QP shall indicate marks of each question and the relevant COs & RBT levels. • The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs & POs. **The final CIE marks will be 50:** Average of all 05 events of Internal Assessment test and formative assessments. **The documents of all the assessments shall be maintained meticulously.**	• The students have to answer 5 full questions, selecting one full question from each module. • Marks scored shall be proportionally reduced to 50 marks.	

2. IBSC/IESC/IPCC – Integrated with Theory & Practical (04 credit courses)

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 50% of the maximum marks (25 marks out of 50). Minimum eligibility of 50% marks shall be attained separately in both the theory component and practical component. **Continuous Internal Evaluation:** CIE will be conducted by the department and it will have 02 component: I. Theory Component. II. Practical Component. I. Theory Component will consist of A. Internal Assessment Test B. Formative assessments (Not required for Integrated courses) **A. Internal Assessment Test:** • There are 03 tests each of 50 marks conducted during 6th week, 10th week & 15th week, respectively. • The question paper will have four questions (max of 3 sub questions) from the notified syllabus. Each question is set for 25 marks. • It is suggested to include questions on laboratory content in the Internal Assessment test Question papers. • The student have to answer 2 full questions (one from 1st & 2nd questions and another from 3rd & 4th question). • Internal Assessment Test question paper shall be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course. **B. Formative assessments:** • Not required for Integrated courses.	The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks). **Semester-End Examination:** Only theory SEE for duration of 03 hours and total marks of 100. • The question paper will have ten questions. Each question is set for 20 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. • The laboratory content must be included in framing the theory question papers. • The students have to answer 5 full questions, selecting one full question from each module. • Marks scored shall be proportionally reduced to 50 marks. **No Practical SEE for Integrated Course.** Note: CAED Course shall not be considered here, it shall be considered as in sl. No. 3 in the next row	The student is declared as a pass in the course if he/she secures a minimum of 45% (45 marks out of 100) in the sum total of the CIE and SEE taken together.

II. Practical Component:

C. Conduction of each experiment/program should be evaluated for 50 marks and average of all the experiments/programs shall be taken. (rubrics will be published by the lab conduction committee)

D. One laboratory Internal Assessment test will be conducted during the 14th week for 50 marks. (rubrics will be published by the lab conduction committee)

The final CIE marks will be 50 =
Avg. {**I** [Avg. of 03 Internal assessment tests] + **II** [Avg. of (C & D)]}
The documents of all the assessments shall be maintained meticulously.

Note: CAED Course shall not be considered here, it shall be considered as in sl. No. 3 in the next row

3. IESC: CAED Course (4 credits)

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 50% of the maximum marks (25 marks out of 50).

- CIE shall be conducted for max. marks of 100 and shall be scaled down to 50 marks
- CIE component should comprise of both Manual and computer drafting i.e. 50% manual and 50% computer drafting out of total 100 marks
- CIE component should comprise of Continuous evaluation of drawing work of students as and when the modules are covered based on below detailed weightage.

Module	Module Max. Marks	Evaluation Weightage in marks	
		Computer display and print out	Manual Sketching
Module 1	20	10	10
Module 2	20	10	10
Module 3	20	10	10
Module 4	20	10	10
Module 5	20	10	10
TOTAL	**100**	**50**	**50**

The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks).

Semester-End Examination:
SEE for duration of 03 hours and total marks of 100.

- SEE shall be conducted and evaluated for maximum marks of 100 and shall be scaled down to 50 marks.
- Question paper shall be made available for each batch as per schedule.
- Evaluation shall be carried jointly by both the internal & external examiners.
- Scheme of Evaluation: To be defined by both the examiners jointly.
- Maximum 3 questions shall be set as per the following pattern.

The student is declared as a pass in the course if he/she secures a minimum of 45% (45 marks out of 100) in the sum total of the CIE and SEE taken together.

- At least one Test covering all the modules is to be conducted for 100 marks during 14th week and the same is to be scaled down to **25 Marks.**
- Assignments = **10 Marks from each module. (50 marks scaled down to 25 Marks)**
- The final CIE 50 marks = Test (25 marks) + Assignment (25 marks).

From Module	Marks Allotted
Module 01 (Choice between Lines or Planes)	30
Module 02 (Compulsory question)	40
Module 03 or Module 04 or Module 05	30
TOTAL	**100**

Q. No.	Manual Sketching	Computer display and print out	TOTAL MARKS
1	15	15	30
2	20	20	40
3	15	15	30
TOT.	**50**	**50**	**100**

4. PCCL: Laboratory course (01 credit course)

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 50% of the maximum marks (25 marks out of 50).

Continuous Internal Evaluation:

CIE will be conducted by the department and it will have only 01 component:

I. Theory Component. (Not required for Laboratory course)
II. Practical Component.

II. Practical Component:

C. Conduction of each experiment/program should be evaluated for 50 marks and average of all the experiments/program shall be taken (rubrics will be published by the lab conduction committee).

D. One laboratory Internal Assessment test will be conducted for 50 marks (rubrics will be published by the lab conduction committee).

The final CIE marks will be 50 = Avg. of (C & D)

The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks).

Semester-End Examination:

Only laboratory SEE will be conducted jointly by the internal examiner and external examiner appointed by COE as per the scheduled timetable for duration of 03 hours.

- The examination shall be conducted for 100 marks and shall be reduced to 50 marks proportionately.
- All laboratory experiments/programs are to be included for practical examination.
- Breakup of marks (Rubrics) and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners (OR) based on the course

The student is declared as a pass in the course if he/she secures a minimum of 45% (45 marks out of 100) in the sum total of the CIE and SEE taken together.

The documents of all the assessments shall be maintained meticulously.	requirement evaluation rubrics shall be decided jointly by examiners. • Students can pick one question (experiment/program) from the questions lot prepared by the internal /external examiners jointly. • Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners. • General rubrics suggested for SEE: writeup-20%, Conduction procedure and results -60%, Viva-voce 20% of maximum marks. • Change of experiment is allowed only once and shall be assessed only for 85% of the maximum marks.	
5. AEC: Ability Enhancement Courses (01 credit courses)		
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 50% of the maximum marks (25 marks out of 50). **Continuous Internal Evaluation:** CIE will be conducted by the department and will have only 01 component: **I. Theory component.** Theory Component will consist of A. Internal Assessment Test B. Formative assessments **A. Internal Assessment Test:** • There are 02 tests each of 50 marks conducted during 6th week & 15th week, respectively. • The question paper will be of Multiple-Choice Questions (MCQ). • The student have to answer all questions. • Internal Assessment Test question paper shall be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course	The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks). **Semester-End Examination:** Theory SEE will be conducted by COE as per the scheduled timetable for duration of 02 hours and total marks of 50. • Multiple choice Question paper. • The students have to answer all questions.	The student is declared as a pass in the course if he/she secures a minimum of 45% (45 marks out of 100) in the sum total of the CIE and SEE taken together.

B. Formative assessments: • 01 formative assessments of 50 marks shall be conducted by the Course coordinator based on the dept. planning before 14th week. • The formative assessments include Assignments/seminars/case study/field survey/ report presentation/course project/etc. • The assignment QP shall indicate marks of each question and the relevant COs & RBT levels. • The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs & POs. **The final CIE marks will be 50:** Average of all 03 events (02 Internal Assessment test and 01 formative assessment). **The documents of all the assessments shall be maintained meticulously.**		
6. HSMC: (01 credit course)		
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 50% of the maximum marks (25 marks out of 50). **Continuous Internal Evaluation:** CIE will be conducted by the department and will have only 01 component: **I. Theory component.** Theory Component will consist of A. Internal Assessment Test B. Formative assessments **A. Internal Assessment Test:** • There are 02 tests each of 50 marks conducted during 6th week & 15th week, respectively. • The question paper will be of Multiple-Choice Questions (MCQ). • The student have to answer all questions.	The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks). **Semester-End Examination:** Theory SEE will be conducted by COE as per the scheduled timetable for duration of 02 hours and total marks of 50. • Multiple choice Question paper. • The students have to answer all questions. • Marks scored shall be proportionally reduced to 50 marks.	The student is declared as a pass in the course if he/she secures a minimum of 45% (45 marks out of 100) in the sum total of the CIE and SEE taken together.

• Internal Assessment Test question paper shall be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course **B. Formative assessments:** • 01 formative assessments of 50 marks shall be conducted by the faculty based on the dept. planning before 14th week. • The formative assessments include Assignments/seminars/case study/field survey/ report presentation/course project/etc. • The assignment QP shall indicate marks of each question and the relevant COs & RBT levels. • The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs & POs. **The final CIE marks will be 50:** Average of all 03 events (02 IA test and 01 formative assessment). **The documents of all the assessments shall be maintained meticulously.**		
7. HSMC: (0 credit courses)		
The weightage is only for Continuous Internal Evaluation (CIE).		
The minimum passing mark for the CIE is 50% of the maximum marks (25 marks out of 50). **Continuous Internal Evaluation:** CIE will be conducted by the department and it will have only 01 component: **I. Theory component.** Theory Component will consist of C. Internal Assessment Test D. Formative assessments **A. Internal Assessment Test:** • There are 02 tests each of 50 marks conducted during 6th week & 15th week, respectively. • The question paper will be of Multiple-Choice Questions (MCQ). • The student have to answer all questions.	• No Semester End Examination.	The student is declared as a pass in the course if he/she secures a minimum of 50% (25 marks out of 50) in the CIE.

• Internal Assessment Test question paper shall be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course **B. Formative assessments:** • 01 formative assessments of 50 marks shall be conducted by the faculty based on the dept. planning during random times. • The formative assessments include Assignments/seminars/case study/field survey/ report presentation/course project/etc. • The assignment QP shall indicate marks of each question and the relevant COs & RBT levels. • The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs & POs. **The final CIE marks will be 50 =** Average of all 03 events (02 IA test and 01 formative assessment). **The documents of all the assessments shall be maintained meticulously.**		
8. NCMC: (0 credit course)		
The weightage is only for Continuous Internal Evaluation (CIE).		
The minimum passing mark for the CIE is 50% of the maximum marks (25 marks out of 50). **Continuous Internal Evaluation:** CIE will be conducted by the department and it will have only 01 component: **I. Theory component.** Theory Component will consist of only 01 assessment A. Internal Assessment Test (not required for NCMC course). B. Formative assessments. **B. Formative assessments:** • 01 formative assessments of 50 marks shall be conducted by the faculty based on the dept. planning during random times. • The formative assessments include Quiz/Assignments/seminars/case study/field survey/ report presentation/course project/etc. • The assignment QP shall indicate marks of each question and the relevant COs & RBT levels.	• No Semester End Examination.	The student is declared as a pass in the course if he/she secures a minimum of 50% (25 marks out of 50) in the CIE.

• The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs & POs. **The final CIE marks will be 50** **The documents of all the assessments shall be maintained meticulously.**		

|| Jai Sri Gurudev ||
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Approved by AICTE, New Delhi.
Autonomous Institute affiliated to Visvesvaraya Technological University, Belagavi
Accredited by NAAC with 'A+'grade, Certified by ISO 9001 - 2015
Recognized by UGC, New Delhi with 2(f) & 12 (B)

Program Outcomes (POs)- Graduate Attributes

Engineering Graduates will be able to:

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

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.

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.

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.

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.

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

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

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

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

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, make effective presentations, and give and receive clear instructions.

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.

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

|| Jai Shree Gurudev ||
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ATAL Ranking:
Band Performer

Band of 151 to 300 in
Innovation Category