



# **NAGARJUNA**

## **COLLEGE OF ENGINEERING & TECHNOLOGY**

**An Autonomous Institute under VTU**

### **Vision**

Leadership and Excellence in Education

### **Mission**

To fulfill the vision by imparting total quality education replete with the philosophy of blending human values and academic professionalism.

### **Scheme and Syllabus**

I<sup>st</sup> Semester B.E

Physics Cycle

Academic Year

2023-24

**Physics Cycle - Civil Stream**

First Semester Physics Cycle - Civil Stream

Sl.No	Course & Course code		Course Title	TD /PSB	Teaching Hours/week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	*ASC(IC)	23MATC11	Calculus & Linear Algebra for Civil	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	23PHYC12	Applied Physics for Civil	Physics	2	2	2	0	03	50	50	100	04
3	ESC	23CIV13	Engineering Mechanics	Civil	3	0	0	0	03	50	50	100	03
4	ESC-1	23ESC145	Introduction to C- Programming	CSE	2	0	2	0	03	50	50	100	03
5	ETC-1	23ETC15E	Renewable Energy Resources	Civil	3	0	0	0	03	50	50	100	03
6	AEC	23ENG16	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMC	23KSK17	Samskrutika Kannada	Humanities	1	0	0	0	01	50	50	100	01
		23KBK17	Balake Kannada										
8	AEC	23IDT18	Innovation and Design Thinking	Any Dept.	1	0	0	0	01	50	50	100	01
TOTAL										400	400	800	20

**SDA**-Skill development Activities, **TD/PSB** – Teaching Department / Paper setting board, **ASC**-Applied Science course, **ESC**-Engineering Science Course, **ETC**-Emerging Technology Course, **AEC**-Ability Enhancement Course, **HSMS** – Humanity and Social Science and management Course, **SDC**-Skill development Course, **CIE**-Continuous Internal Evaluation, **SEE**-Semester and Examination, **IC**-Integrated Course (Theory Course Integrated with Practical Course)

Course Title	CALCULUS AND LINEAR ALGEBRA for civil engineering stream			
Course Code	23MATC11		CIE Marks	50
Course Type	Integrated		SEE Marks	50
Teaching Hours/Week (L: T: P: S)	2:2:2:0		Total Marks	100
Total Hours of Pedagogy	Theory	40 hours	Exam Hours	03
	Practical	10 to 12 slots	Credits	04
<b>Course objectives:</b> The goal of the course <b>Calculus and Linear Algebra for civil engineering stream</b> is to <ul style="list-style-type: none"><li>● <b>Familiarize</b> the importance of calculus associated with one variable and two variables for civil engineering.</li><li>● <b>Analyze</b> Civil engineering problems applying Ordinary Differential Equations.</li><li>● <b>Develop</b> the knowledge of Linear Algebra refereeing to matrices.</li></ul>				
<b>Teaching-Learning Process (General Instructions)</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes. <ol style="list-style-type: none"><li>1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop students theoretical and applied mathematical skills.</li><li>2. State the need for Mathematics with Engineering Studies and Provide real-life examples.</li><li>3. Support and guide the students for self–study.</li><li>4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.</li><li>5. Encourage the students for group learning to improve their creative and analytical skills.</li><li>6. Show short related video lectures in the following ways:<ul style="list-style-type: none"><li>● As an introduction to new topics (pre-lecture activity).</li><li>● As a revision of topics (post-lecture activity).</li><li>● As additional examples (post-lecture activity).</li><li>● As an additional material of challenging topics (pre-and post-lecture activity).</li><li>● As a model solution of some exercises (post-lecture activity).</li></ul></li></ol>				
Module-1		- 08 Hours		
<b>Differential Calculus:</b> <b>Introduction to polar coordinates and curvature relating to Civil engineering.</b> Polar coordinates, Polar curves, angle between the radius vector and the tangent, angle between two curves. Pedal equations. Curvature and Radius of curvature - Cartesian, Parametric, Polar and Pedal forms. Problems. <b>Self-study:</b> Center and circle of curvature, evolutes and involutes. <b>Applications:</b> Structural design and paths, Strength of materials, Elasticity. [Text 1: 4.7, 4.8, 4.10, 4.11] <b>(RBT Levels: L1, L2 and L3 )</b>				
Module-2-		08 Hours		
<b>Series Expansion and Multivariable Calculus:</b> <b>Introduction to series expansion and partial differentiation in the field of Civil engineering applications.</b> Taylor’s and Maclaurin’s series expansion for one variable (Statement only) – problems. Indeterminate forms-L’Hospital’s rule. Problems. Partial differentiation, total derivative-differentiation of composite functions. Jacobian and problems. Maxima and minima for a function of two variables. Problems.				

**Self-study:** Euler's Theorem and problems. Method of Lagrange undetermined multipliers with single constraint.

**Applications:** Computation of stress and strain, Errors and approximations, Estimating the critical points and extreme values.

[Text 1: 4.4, 4.5, 5.2, 5.5, 5.6, 5.7, 5.11]

(RBT Levels: L1, L2 and L3)

### Module-3

-08 Hours

#### Ordinary Differential Equations (ODE's) of first order:

**Introduction to first-order ordinary differential equations pertaining to the applications for Civil engineering.**

Linear and Bernoulli's differential equations. Exact and reducible to exact differential equations– Integrating factor on  $\frac{1}{N} \left( \frac{\partial M}{\partial y} - \frac{\partial N}{\partial x} \right)$  and  $\frac{1}{M} \left( \frac{\partial N}{\partial x} - \frac{\partial M}{\partial y} \right)$ . Applications of ODE's–Orthogonal trajectories, Newton's law of cooling.

**Nonlinear differential equations:** Introduction to general and singular solutions; Solvable for p only; Clairaut's equations, reducible to Clairaut's equations- Problems.

**Self Study:** Applications of ODE's: bending of the beam and whirling of shaft' Solution of non-linear ODE by the method of solvable for x and y.

**Applications:** Structural analysis, Dynamics, elasticity and earth quake engineering.

[Text 1: 11.9, 11.10, 11.11, 11.12, 11.13, 11.14, 12.3, 12.6]

(RBT Levels: L1, L2 and L3)

### Module-4

- 08 Hours

#### Integral Calculus:

**Introduction to Integral Calculus in Civil Engineering applications.**

**Multiple Integrals:** Evaluation of double and triple integrals, evaluation of double integrals by change of order of integration, changing into polar coordinates.

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

**Self-study:** Applications to find Area and Volume by a double integral. Problems. Centre of gravity.

[Text 1: 7.1, 7.2, 7.5, 7.7(2)(i), 7.14, 7.15, 7.16]

**Applications:** Applications to mathematical quantities (Area, Surface area, Volume), Analysis of probabilistic models.

(RBT Levels: L1, L2 and L3)

### Module-5

-8 Hours

#### Linear Algebra:

**Introduction of linear algebra related to Civil Engineering applications.**

Elementary row transformation of a matrix, Rank of a matrix. Consistency and Solution of system of linear equations; Gauss-elimination method, Gauss-Jordan method and Approximate solution by Gauss-Seidel method.

Eigen values and Eigen vectors-Rayleigh's power method to find the dominant Eigen value and Eigen vector.

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

**Applications:** Structural Analysis, Balancing equations.

[Text 1: 2.7, 2.10, 2.13, 28.6, 28.7, 28.9]

(RBT Levels: L1, L2 and L3)

**Teaching-Learning Process for all modules**

**Chalk and Talk/PowerPoint presentation/YouTube videos.**

**List of Laboratory experiments (2 hours/week per batch/ batch strength 15) 10 lab sessions + 1 repetition class + 1 Lab Assessment**

1	2D plots for Cartesian and polar curves
2	Finding angle between polar curves, curvature and radius of curvature of a given curve
3	Finding partial derivatives, Jacobian and plotting the graph
4	Applications to Maxima and Minima of two variables
5	Solution of first-order differential equation and plotting the graphs
6	Program to compute area, volume and centre of gravity

7	Evaluation of improper integrals
8	Numerical solution of system of linear equations, test for consistency and graphical representation
9	Solution of system of linear equations using Gauss-Seidel iteration
10	Compute eigen values and eigen vectors and find the largest and smallest eigen value by Rayleigh power method.

#### Course Outcomes:

After successfully completing the course, the students will be able to:

1. Apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions.
2. Solve first-order linear/nonlinear ordinary differential equations analytically using standard methods.
3. Understand the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume
4. Make use of matrix theory for solving for system of linear equations and Compute eigen values and eigen vectors
5. Use the modern mathematical tools by PYTHON software.

#### Evaluation Details:

Evaluation Type		Component	Max Marks	Marks Reduced to	Min. Marks	Evaluation Details
Theory Component	Internal Assessment Tests(IAT)	IAT-1	25	15	10	Average of two IATs, Scaled down to 15 marks
		IAT-2	25			
	Comprehensive Continuous Evaluations (CCE)	CCE-1	10	10		Any two Assessment met as per 22OB4.2 of regulations, Average of two CCEs, scaled Down to 10marks
		CCE-2	10			
	Total CIE -Theory			25	10	Scale down marks of IAT and CCE to25
Laboratory Component	Practical and Lab Record	-	15	25	10	Conduction of experiments and preparation of Lab records, etc
	Lab Test	50	10			One test to be conducted after the completion of All lab experiments.
	Total CIE –Practical			25	10	
Total CIE (Theory + Lab)				50	20	
SEE			100	50	18	Conducted for 100 marks and scaled down to 50.
CIE + SEE				100	40	

**Text Books:**

- ### Reference Books:

- ### E-Resources:

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

- Quizzes
- Assignments
- Seminars

**CO- PO Mapping :**

[illegible]

Course Title:	Applied Physics for Civil Engineering			
Course Code:	23PHYC12/22	CIE Marks	50	
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50	
		Total Marks	100	
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03+02	
Total Hours of Pedagogy	40 hours Theory + 10 to 12 Lab slots	Credits	04	
<b>Course objectives</b> <ul style="list-style-type: none"><li>• To study the essentials of photonics for engineering applications.</li><li>• To understand the types of oscillation, shock waves &amp; its generation, and applications.</li><li>• To study the principles of quantum mechanics</li><li>• To study the electrical properties of materials.</li><li>• To Study the elastic properties of materials and failures of engineering materials.</li></ul>				
<b>Teaching-Learning Process</b> <p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes and make Teaching-Learning more effective</p> <ol style="list-style-type: none"><li>1. Flipped Class</li><li>2. Chalk and Talk</li><li>3. Blended Mode of Learning</li><li>4. Simulations, Interactive Simulations and Animations</li><li>5. NPTEL and Other Videos for theory topics</li><li>6. Smart Class Room</li><li>7. Lab Experiment Videos</li></ol>				
<b>Module-1 (8 Hours)</b>				
<b>Laser and Optical Fibers:</b> <p><b>LASER:</b> Basic properties of a LASER beam, Interaction of Radiation with Matter, Einstein’s A and B Coefficients (derivation of expression for energy density), Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Nd-YAG Laser, Application of Lasers.</p> <p><b>Optical Fiber:</b> Principle and structure, Acceptance angle and Numerical Aperture (NA) and derivation of Expression for NA, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic Communication. Numerical Problems.</p> <p><b>Pre-requisite: Properties of light</b></p> <p><b>Self-learning: Total Internal Reflection &amp; Propagation Mechanism (Optical Fibers)</b></p>				
<b>Module-2 (8 Hours)</b>				
<b>Quantum Mechanics:</b> <p>de Broglie Hypothesis and Matter Waves, Photoelectric Effect, Compton Scattering, Dual nature, Heisenberg’s Uncertainty Principle and its application (Nonexistence of electron inside the nucleus-Non Relativistic), Wave Function, Time independent Schrodinger wave equation (derivation) , Physical Significance of a wave function and Probability density, Eigen functions and Eigen Values, Particle inside one-dimensional infinite potential well, Waveforms and Probabilities. Numerical problems.</p> <p><b>Pre-requisite: Wave-Particle dualism</b></p> <p><b>Self-learning: de Broglie Hypothesis</b></p>				
<b>Module-3 (8 Hours)</b>				
<b>Oscillations and Waves</b> <p><b>Oscillations:</b> Basics of SHM, derivation of equation for SHM, Equation of motion for free oscillations, Natural frequency of oscillations.</p> <p><b>Damped Oscillations:</b> Theory of damped oscillations (derivation), over damping, critical &amp; under damping (graphical representation), quality factor.</p> <p><b>Forced Oscillations:</b> Theory of forced oscillations (derivation).</p> <p><b>Shock waves:</b> Mach number, Properties of Shock waves, Construction and working of Reddy shock tube, applications of shock waves, Numerical problems.</p> <p><b>Pre-requisites: Basics of Oscillations</b></p> <p><b>Self-learning: Simple Harmonic motion, differential equation for SHM</b></p>				
<b>Module-4 (8 Hours)</b>				

**Electrical Properties of Materials and Applications**

Free Electron concept, Electrical conductivity in metals, Resistivity and Mobility, Concept of Phonon, Matthiessen's rule. Introduction to Super Conductors, Temperature dependence of resistivity, Meissner's Effect, Silsbee Effect, Types of Superconductors, Temperature dependence of critical field, BCS theory (Qualitative), Quantum Tunneling, High- Temperature superconductivity, Josephson Junction, DC and AC SQUIDS (Qualitative), MAGLEV, Applications in Quantum Computing (Mention). Numerical problems.

**Pre-requisites: Basics of Electrical conductivity**

**Module-5 (8 hours)****Self-learning: Resistivity and Mobility****Elasticity:**

Stress-Strain Curve, Stress hardening and softening. Elastic Moduli, Poisson ' s ratio and its limiting values. Relation between  $Y$ ,  $n$  and  $\sigma$  (with derivation) , beams, bending moment and derivation of expression Cantilever and their Engineering Applications, Elastic materials (qualitative). Failures of engineering materials - ductile fracture, brittle fracture, stress concentration, fatigue and factors affecting fatigue (only qualitative explanation) Numerical problems.

**Pre-requisites: Elasticity, Stress & Strain**

**Self-learning: Stress-Strain Curve****Laboratory Component:**

- Exercise
- Demonstration (DM)
- Virtual Lab (VL)
- Open Ended (OE)

**List of Experiments:**

- Wavelength of LASER using Grating
- Charging and Discharging of a Capacitor
- Series LCR
- Parallel LCR
- Photo-Diode Characteristics
- Single Cantilever (DM)
- $n$  by Tensional Pendulum (DM)
- Four Probe Method (VL)
- Numerical Aperture using Optical fiber (VL)
- Planck's Constant using LEDs (OE)

**Course outcome (Course Skill Set)**

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

CO1	<b>Understand</b> the fundamentals of photonics, oscillation, waves, quantum mechanics, elasticity and material properties.
CO2	<b>Apply</b> the concept of photonics, oscillation, waves, quantum mechanics, elasticity and transport phenomena in metals.
CO3	<b>Determine</b> the desired parameters to use it in various engineering applications.
CO4	Usage of <b>Modern tools</b> to develop the concept of physics & to perform as a <b>member of team</b> to build a model.
CO5	<b>Conduct, analyze and interpret</b> the data and results for applied physics experiments.



Assessment Details (both CCE and SEE)						
Evaluation Type		Component	Max. Marks	Marks reduced to	Min. marks	Evaluation details
Theory Component	Internal Assessment Test(IAT)	IAT - 1	25	15	10	Average of two IATs, Scaled down to 15 marks
		IAT - 2	25			
	Comprehensive Continuous Evaluations (CCE)	CCE -1	10	10		Minimum of two Assessments methods as per 22OB4.2 of regulations. Average of CCEs, scaled down to 10marks.
		CCE -2	10			
Total CIE – Theory				25	10	Scale down marks of IAT & CCE to 25
Laboratory Component	Practical and Lab Records	-	15	25	10	Conduction of experiments and preparation of Lab records, etc.
	Lab test	50	10			One test to be conducted after the completion of all lab experiments.
Total CIE – Practicals				25	10	
Total CIE (Theory + Lab)				50	20	
SEE			100	50	18	Conduction of 100 marks and scaled down to 50.
CIE + SEE				100	40	

The minimum marks to be secured in CIE to appear for SEE shall be 10(40% of minimum marks: 25) in theory component and 10(40% of maximum marks: 25) in the practical component. The laboratory component of the IPCC/Integrated course shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included in the question paper.

**Suggested Learning Resources:**

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

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8<sup>th</sup> Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. Concepts of Modern Physics, Arthur Beiser, McGraw-Hill, 6<sup>th</sup> Edition, 2009.
4. Lasers and Non-Linear Optics, B B Loud, New age international, 2011 edition.
5. A textbook of Engineering Physics by M .N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
6. Engineering Physics, S P Basavaraj, 2005 Edition,
7. Introduction to Superconductivity, Michael Tinkham, McGraww Hill, INC, II Edition

**Web links and Video Lectures (e-Resources):**

**LASER:** <https://www.youtube.com/watch?v=WgzynzPiyc>

**Superconductivity:** <https://www.youtube.com/watch?v=MT5XI5ppn48>

**Optical Fiber:** [https://www.youtube.com/watch?v=N\\_kA8EpCUQo](https://www.youtube.com/watch?v=N_kA8EpCUQo)

**Quantum Mechanics:** <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>

**Oscillations and waves :** <https://openstax.org/books/college-physics-2e/NPTEL>

**Superconductivity:** <https://archive.nptel.ac.in/courses/115/103/115103108/>

**Virtual LAB:** <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>

**Virtual LAB:** <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

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

<http://nptel.ac.in> <https://swayam.gov.in>

[https://virtuallabs.merlot.org/vl\\_physics](https://virtuallabs.merlot.org/vl_physics).

<http://phet.colorado.edu>

<https://www.mypysicslab.com>

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

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	0	0	0	0	0	0	0	0	0	0	0	2
CO2	3	1	0	0	0	0	0	0	0	0	0	2
CO3	3	3	0	0	0	0	0	0	0	0	0	2
CO4	1	0	0	0	2	0	0	1	3	0	0	2
CO5	1	0	0	2	2	0	0	1	0	0	0	2

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

Course Name – Engineering Mechanics			
Course Code	23CIV13	CIE Marks	50
Teaching Hours/Week : 3: 0: 0: 0	Credits: 3	SEE Marks	50
Total Hours of Pedagogy	40 hours Theory	Total Marks	100
Credits	03	Exam Hours	03
<b>Course objectives:</b> This course will enable students to: <ol style="list-style-type: none"> <li>1. Analyze the problems involving forces, moments with their applications.</li> <li>2. Compute the effect of friction on different planes.</li> <li>3. Evaluate centroid and moment of inertia for plane areas.</li> <li>4. Apply the concept of kinematics and kinetics in engineering problems.</li> </ol>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes and make Teaching-Learning more effective <ol style="list-style-type: none"> <li>1. Flipped Class</li> <li>2. Chalk and Talk</li> <li>3. Blended Mode of Learning</li> <li>4. Simulations, Interactive Simulations and Animations</li> <li>5. NPTEL and Other Videos for theory topics</li> <li>6. Smart Class Room</li> </ol>			
<b>Module-1</b>			
			<b>08 Hours</b>
<b>Resultant of coplanar force system</b> Basic dimensions and units, Idealizations, Classification of force system, principle of transmissibility of a force, composition of forces, resolution of a force, free body diagrams, moment, Principle of moments, couple, Resultant of coplanar concurrent force system, Resultant of coplanar non-concurrent force system, Numerical examples applied to Civil Engineering. <b>(An experiment to be conducted to show polygon law of forces and a graphical approach has to be taught to determine the resultant of coplanar forces)</b>			
<b>Module-2</b>			
			<b>08 Hours</b>
<b>Equilibrium of coplanar force system</b> Introduction to force, Equilibrium of coplanar concurrent force system, Lami's theorem, Equilibrium of coplanar parallel force system, types of beams, types of loadings, types of supports, Equilibrium of coplanar non-concurrent force system, support reactions of statically determinate beams subjected to various types of loads, Numerical examples applied to Civil Engineering. <b>(Experiment to be shown on determination of reactions of a simply supported beam in equilibrium state)</b>			
<b>Module-3</b>			
			<b>08 Hours</b>
<b>Analysis of Trusses</b> Introduction, Classification of trusses, analysis of plane perfect trusses by the method of joints and method of sections, Numerical examples applied to Civil Engineering. <b>Friction</b> Introduction, laws of Coulomb friction, equilibrium of blocks on horizontal plane, equilibrium of blocks on inclined plane, ladder friction, wedge friction, Numerical examples applied to Civil Engineering. <b>(Experiment on coefficient of friction to be conducted)</b>			

Module-4					
					08 Hours
<b>Centroid of Plane areas</b> Definition, Centroid of simple figures (rectangle, triangle, semicircle, quarter circle, sector of circle) from first principle, centroid of composite sections, Centre of gravity and its implications, Numerical examples applied to Civil Engineering.					
<b>Moment of inertia of plane areas</b> Definition, Moment of inertia of plane sections (rectangle, triangle, semicircle and quarter circle) from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections, Numerical examples applied to Civil Engineering.					
<b>(Experiment to be conducted on Moment of Inertia of a fly wheel)</b>					
Module-5					
					08 Hours
<b>Kinematics</b> Linear motion: Introduction, Displacement, speed, velocity, acceleration, acceleration due to gravity, Numerical examples on linear motion. Projectiles: Introduction, numerical examples on projectiles.					
<b>Kinetics</b> Introduction, D ‘Alembert’s principle of dynamic equilibrium and its application in-plane motion and connected bodies including pulleys, Numerical examples applied to Civil Engineering.					
<b>Teaching-Learning Process for all modules</b>			<b>Chalk and Talk, PowerPoint presentation, Flip Teaching</b>		
<b>Course Outcomes</b> At the end of the course the student will be able to : <div><div>1. Compute the resultant of a force system and resolution of a force.</div><div>2. Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces.</div><div>3. Analyze the frictional resistance offered by different planes.</div><div>4. Gain knowledge regarding center of gravity and moment of inertia and apply them for practical problems.</div><div>5. Analyze the bodies in motion.</div></div>					
<b>Assessment Details (both CIE and SEE)</b>					
<b>Component</b>	<b>Type of Assessment</b>	<b>Max. Marks</b>	<b>Total</b>	<b>Reduced Marks</b>	<b>Total</b>
<b>CIE-Theory</b>	<b>CIE-1</b>	<b>25</b>	<b>100</b>	<b>50</b>	<b>50</b>
	<b>CIE-2</b>	<b>25</b>			
	<b>AAT-1</b>	<b>25</b>			
	<b>AAT-2</b>	<b>25</b>			
<b>SEE</b>	<b>End Exam</b>	<b>100</b>		<b>50</b>	<b>50</b>
<b>Grand Total</b>				<b>100</b>	
<b>Suggested Learning Resources:</b> <b>Text Books:</b> <div><div>1. Engineering Mechanics by Nelson, 1st Edition (2009), McGraw Hill Publishers.</div><div>2. Engineering Mechanics: Principles of Statics and Dynamics by Hibbler R. C, 2017, Pearson Press.</div><div>3. Mechanics for Engineers, Statics and Dynamics by Ferdinand Beer and E Russell Johnston, 4th Edition (1972), McGraw Hill Company, New York.</div></div>					

**Reference Books:**

1. Engineering Mechanics by Timoshenko and Young; 5th edition (2017) McGraw Hill Book Company , New Delhi.
2. Engineering Mechanics , Statics and Dynamics by Meriam JL Kraige, (1993) Wiley Publishers, New Delhi.
3. Basic Civil Engineering and Engineering Mechanics by Bansal R. K., Rakesh, Ranjan Beohar and Ahmad Ali Khan, 2015, Laxmi Publications.

**E-Resources:**

<https://archive.nptel.ac.in/courses/112/106/112106286/>

<http://www.mooc-list.com/course/introduction-engineering-mechanics-coursera>

**CO- PO Mapping :**

POS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
COs															
CO 1	3	2												3	
CO 2	3	2												3	
CO 3	3	2												3	
CO 4	3	2												3	
CO 5	3	1												3	

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

Course Title:	<b>INTRODUCTION to C PROGRAMMING</b>		
Course Code:	<b>23ESC145</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L: T: P: S)	2:0:2:0	Exam Hours	3+2
Total Hours of Pedagogy	40 hours	Credits	03
<b>Course objectives</b> <ul style="list-style-type: none"> <li>• CLO 1: Elucidate the basic architecture and functionalities of a computer.</li> <li>• CLO 2: Apply programming constructs of C language to solve the real-world problems.</li> <li>• CLO 3: Explore user-defined data structures such as arrays, structures and pointers in implementing solutions to problems.</li> <li>• CLO 4: Design and develop solutions to problems using structured programming constructs such as functions and procedures.</li> </ul>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes. <ol style="list-style-type: none"> <li>1. Lecturer method (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.</li> <li>2. Use of Video/Animation to explain functioning of various concepts.</li> <li>3. Encourage collaborative (Group Learning) Learning in the class.</li> <li>4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.</li> <li>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.</li> <li>6. Introduce Topics in manifold representations.</li> <li>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.</li> <li>8. Discuss how every concept can be applied to the real world-and when that's possible, it helps to improve the students' understanding.</li> <li>9. Use <a href="https://pythontutor.com/visualize.html#mode=edit">https://pythontutor.com/visualize.html#mode=edit</a> in order to visualize the operations of C Programs.</li> </ol>			
<b>Module-1 (8 Hours)</b>			
<b>Introduction to Computer Systems and C Programming Language:</b> Introduction to computers, input and output devices, designing efficient programs. Introduction to C, Structure of C program, Files used in a C program, Compilers, Compiling and executing C programs, variables, constants, Input/Output statements in C.			
<b>Pre-requisite:</b> Basic Mathematics, Basics of Computer Organization <b>Self-learning:</b> Sample programs to demonstrate the compilation and execution of C programs, use of variables, constants and Input / Output statements in C. <b>Textbook:</b> Chapter 1.1-1.9, 2.1-2.2, 8.1 - 8.6 ,9.1-9.14			
<b>Module-2 (8 Hours)</b>			
<b>Operators and Expressions, Decision Control and Looping Statements</b> <b>Operators and Expressions:</b> Operators in C, Type conversion and typecasting. <b>Decision control and Looping statements:</b> Introduction to decision control, Conditional branching statements, iterative statements, nested loops, break and continue statements, goto statement.			
<b>Pre-requisite:</b> Basic Mathematics, Basics of Computer Organization <b>Self-learning:</b> Sample C programs to demonstrate the use of expressions, decision control and looping constructs. <b>Textbook:</b> Chapter 9.15-9.16, 10.1-10.6			
<b>Module-3 (8 Hours)</b>			

**Arrays and Functions**

**Functions:** Introduction using functions, Function definition, function declaration, function call, return statement, passing parameters to functions, scope of variables, storage classes, recursive functions.

**Arrays:** Declaration of arrays, accessing the elements of an array, storing values in arrays, Operations on arrays, Passing arrays to functions, two dimensional arrays, operations on two-dimensional arrays, two-dimensional arrays to functions, multidimensional arrays, applications of arrays.

**Pre-requisite:** Basic Mathematics, Basics of Computer Organization

**Self-learning:** Sample C programs to demonstrate the use of arrays and program modularization.

Textbook: Chapter 11.1-11.10, 12.1-12.10,12.12

**Module-4 (8 Hours)****Strings and Pointers**

**Strings:** Introduction, string taxonomy, operations on strings, Miscellaneous string and character functions, arrays of strings.

**Pointers:** Introduction to pointers, declaring pointer variables, Types of pointers, Passing arguments to functions using pointers.

**Pre-requisite:** Basic Mathematics, Basics of Computer Organization

**Self-learning:** Sample programs to demonstrate the use of strings and pointers.

Textbook: Chapter 13.1-13.6, 14-14.7

**Module-5 (8 hours)**

**Structure, Union, and Enumerated Data Type:** Introduction, structures and functions, Unions, unions inside structures, Enumerated data type.

**Files:** Introduction to files, using files in C, reading and writing data files, Detecting end of file.

**Pre-requisite:** Basic Mathematics, Basics of Computer Organization

**Self-learning:** Sample programs to demonstrate the use of structures, unions and file access.

Textbook: Chapter 15.1 – 15.10, 16.1-16.5

**List of Experiments:**

1. C Program to find mechanical energy of a particle using  $E=mgh+1/2mv^2$
2. C Program to convert kilometers into meters and centimeters.
3. C Program to check whether the given character is lowercase or uppercase or special character.
4. Given the values x, y, p, q of a simple chemical equation of the type:  $b_1A_x + b_2B_y = b_3A_p B_q$  find the values of constants  $b_1, b_2, b_3$  such that the equation is balanced on both sides and it must be the reduced form.
5. Implement Matrix multiplication and validate the rules of multiplication.
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. Write functions to implement string operations such as compare, concatenate, and find string length. Use the parameter passing techniques.
9. 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.
10. Develop a program using pointers to compute the sum, mean and standard deviation of all elements stored  
In an array of N real numbers.

11. Simulate a simple calculator to demonstrate at least 5 arithmetic operations of your choice.

<b>Suggested Learning Resources:</b>	
<b>Textbooks</b> 1. Computer fundamentals and programming in c, “Reema Thareja”, Oxford University, Second edition, 2017.	
<b>Reference Books:</b> 1. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill. 2. Brian W. Kernighan and Dennis M. Ritchie, The „C“ Programming Language, Prentice Hall of India.	
<b>Web links and Video Lectures (e-Resources):</b> 1. <a href="http://elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html">elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html</a> 2. <a href="https://nptel.ac.in/courses/106/105/106105171/">https://nptel.ac.in/courses/106/105/106105171/</a> MOOC courses can be adopted for more clarity in understanding the topics and verities of problem solving methods. 3. <a href="https://tinyurl.com/4xmrexre">https://tinyurl.com/4xmrexre</a>	
<b>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</b> <ul style="list-style-type: none"><li>• Quizzes</li><li>• Assignments</li><li>• Seminars</li></ul>	
<b>Course outcome (Course Skill Set)</b> At the end of the course the student will be able to:	
CO1	Elucidate the basic architecture and functionalities of a computer.
CO2	Apply programming constructs in C to solve the real-world problem.
CO3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting.
CO4	Explore user-defined data structures like structures, unions and pointers in implementing solutions.
CO5	Design and develop solutions to problems using modular programming constructs.



<b>RENEWABLE ENERGY SOURCES</b>			
Course Code	23ETC15E	CIE Marks	50
Teaching Hours/Week (L: T: P: S) (3:0:0:0)	Credits (3:0:0:0)	SEE Marks	50
Total Hours of Pedagogy	40 hours Theory	Total Marks	100
Credits	03	Exam Hours	03
<b>Course Objectives:</b>			
<p>The students will be able to :</p> <ul style="list-style-type: none"> <li>● Provide detailed information of the present energy scenario and the available Renewable Energy Resources.</li> <li>● Get a detailed insight knowledge in basics of solar radiation geometry and various measurement techniques.</li> <li>● Understand the solar energy through solar thermal devices, PV conversion and their performance analysis</li> <li>● Gain conceptual knowledge about the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal.</li> <li>● Give introduction to Energy from Biomass, Hydrogen energy and their impact on environment and sustainability</li> </ul>			
<b>Syllabus</b>			
<b>Module – I</b>			
<b>Introduction</b>			
<p>Introduction: Principles of Renewable Energy. Energy and sustainable development, fundamentals and social implications.</p> <p>worldwide renewable energy availability, renewable energy availability in India, brief descriptions on solar energy, wind energy, tidal energy, wave energy, ocean thermal energy, biomass energy, geothermal energy.</p> <p>Oil shale. Introduction to Internet of energy (IOE).</p>			
8 Hrs			
<b>Module – II</b>			
<b>Solar Energy</b>			
<p>Solar Energy: Fundamentals; Solar Radiation. Estimation of solar radiation on horizontal and inclined surfaces Solar radiation Measurements- Pyrheliometers, Pyrometer, Sunshine Recorder. Solar Thermal systems: Flat plate collector.</p> <p>Solar distillation. Solar pond electric power plant.Solar electric power generation- Principle of Solar cell, Photovoltaic system for electric power generation, advantages, Disadvantages and applications of solar photovoltaic system.</p>			
8 Hrs			
<b>Module – III</b>			
<b>Wind Energy, Biomass Energy</b>			
<p>Wind Energy: Properties of wind, availability of wind energy in India. Wind velocity and power from wind.</p> <p>Major problems associated with wind power.</p> <p>Basic components of wind energy conversion system (WECS). Classification of WECS- Horizontal axis- single, double and multi blade system. Vertical axis- Savonius and Darrieus types.</p> <p>Biomass Energy: Introduction, Photosynthesis Process; Biofuels; Biomass Resources; Biomass conversion technologies -fixed dome; Urban waste to energy conversion; Biomass gasification (Downdraft) .</p>			
08 Hrs			

#### Module – IV

##### Tidal Power, Ocean Thermal Energy Conversion

Tidal Power: Tides and waves as energy suppliers and their mechanics; fundamental characteristics of tidal power, harnessing tidal energy, advantages and limitations

Ocean Thermal Energy Conversion: Principle of working, OTEC power stations in the world, problems associated with OTEC.

08 Hrs

#### Module – V

##### Green Energy

Green Energy: Introduction, Fuel cells: Classification of fuel cells – H<sub>2</sub>; Operating principles, Zero energy Concepts. Benefits of hydrogen energy, hydrogen production technologies (electrolysis method only), hydrogen energy storage, applications of hydrogen energy, problem associated with hydrogen energy.

10 Hrs

#### Course Outcomes:

Students will be able to

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

- Explain the present energy scenario and the available Renewable Energy Resources.
- Describe the basics of solar radiation geometry and various measurement techniques.
- Analyze the knowledge gained in tapping the solar energy through solar thermal devices, pvc on version and their performance analysis.
- Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal.
- Apply the Green energy concept for futuristic sustainable development.

#### Assessment Details (both CIE and SEE)

Component		Weightage (%)	
IAT 1			
IAT 2			
CCE 1			
CCE 2			
	Lab Test		
	Lab Record		

**Text Books:**

- Non-conventional Energy sources, G D Rai, Khanna Publication, Fourth Edition,
- Energy Technology, S.Rao and Dr. B.B. Parulekar, KhannaPublication.Solar energy, Subhas P Sukhatme, Tata McGraw Hill, 2nd Edition, 1996.
- Principles of Energy conversion, A.W.Culp Jr. McGraw Hill, 1996
- Non-Convention Energy Resources, ShobhNath Singh, Pearson, 2018

**Reference Books:**

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

**E-Resources:**

E-book URL: <https://www.investopedia.com/terms/i/internet-energy>

E-book URL: <https://www.pdfdrive.com/non-conventional-energy-sources-e10086374.html>

E-book URL: <https://www.pdfdrive.com/non-conventional-energy-systems-nptel-d17376903.html>

E-book URL: <https://www.pdfdrive.com/renewable-energy-sources-and-their-applications-e33423592.html>

E-book URL: <https://www.pdfdrive.com/lecture-notes-on-renewable-energy-sources-e34339149.html>

[https://onlinecourses.nptel.ac.in/noc18\\_ge09/preview](https://onlinecourses.nptel.ac.in/noc18_ge09/preview)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1							1						2	1	3
CO2	3						1						3	1	1
CO3	3						1							1	1
CO4							1						3	1	1
CO5							1						3	2	2

**SEMESTER - 1**

SEMESTER 1

Course Name		Communicative English	
Course Code:	23ENG16	CIE Marks	50
Teaching Hours/Week (L: T: P: S) (1:0:0:0)	Credits (1:0:0:0)	SEE Marks	50
Total Hours of Pedagogy	24 hours Theory	Total Marks	100
Credits	01	Exam Hours	01
<b>Course objectives:</b> <b>This course will enable students to:</b> <ol style="list-style-type: none"><li>1. To know about Fundamentals of Communicative English and Communication Skills in general.</li><li>2. Understanding how to connect and communicate when meeting for the first time. &amp; English grammar and essentials of important language skills.</li><li>3. How to describe self &amp; how to case interests &amp; hobbies. Learning the Usage of Adjectives, Adverbs, Articles Tense: Continuous Tenses</li><li>4. Understanding/ learning to describe things &amp; others. incorporating Grammar in communication</li><li>5. Improving Communication &amp; Presentation skills &amp; eliminating MTI.</li></ol>			
<b>Teaching-Learning Process (General Instructions)</b> These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes. These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effectively: Teachers shall adopt suitable pedagogy for an effective teaching-learning process. The pedagogy shall involve the combination of different methodologies that suit modern technological tools and software to meet the present requirements of the Global employment market. (i) Direct instructional method (Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools), (iii) Blended learning (Combination of both), (iv) Enquiry and evaluation-based learning, (v) Personalized learning, (vi) Problems-based learning through discussion, (vii) Following the method of expeditionary learning Tools and techniques, (viii) Use of audio-visual methods through language Labs in teaching LSRW skills.  Apart from conventional lecture methods, various types of innovative teaching techniques through videos, and animation films may be adapted so that the delivered lesson can progress the students In theoretical applied and practical skills in teaching of communicative skills in general.			
Module-1		5 hours	
<b>Introduction to Communicative English:</b> Introduction, Language as a Tool, Fundamentals of Communicative English, Process of Communication, Barriers to Effective Communicative English, Different styles and levels in Communicative English (Communication Channels). Interpersonal and Intrapersonal Communication Skills, How to Improve and Develop Interpersonal and Intrapersonal Communication Skills.			
Module-2		05 hours	
<b>Speaking activity:</b> Social graces, Greeting, Self-introduction, introducing others Asking for and Giving Information. Grammar and Vocabulary in Use: Parts of Speech, Nouns, Pronouns Articles, Asking questions. (WH, Aux Verbs)			
Module-3		04 Hours	
<b>Speaking activity</b> Speaking about Routine, Hobbies, Likes and Dislikes Grammar and Vocabulary in Use: Verb= Main / Assistant, Forms of Verbs, Tense: Simple present tense, Writing exercises: Subject Verb Agreement, Positive and Negative sentences, Question tags			

Module-4		05 Hours																					
Basic English Communicative Grammar and Vocabulary PART - II: Word formation - Prefixes and Suffixes, Contractions and Abbreviations. Word Pairs (Minimal Pairs) – Exercises, Tense and Types of tenses, The Sequence of Tenses (Rules in use of Tenses) and Exercises on it.																							
Module-5		05 Hours																					
<b>Communication Skills for Employment:</b> Information Transfer: Oral Presentation - Examples and Practice. Extempore / Public Speaking, Difference between Extempore / Public Speaking, Communication Guidelines for Practice. Mother Tongue Influence (MTI) – Various Techniques for Neutralization of Mother Tongue Influence – Exercises.																							
<b>Teaching-learning process for all modules</b>		<b>Chalk and Talk, PowerPoint presentation, flip teaching, YouTube videos</b>																					
<b>Course Outcomes</b> At the end of the course, the student will be able to : <ol style="list-style-type: none"><li>Understand and apply the Fundamentals of Communication Skills in their communication skills.</li><li>Identify the nuances of phonetics, and intonation and enhance pronunciation skills.</li><li>To impart basic English grammar and essentials of language skills as per present requirement.</li><li>Understand and use all types of English vocabulary and language proficiency.</li><li>Adopt the Techniques of Information Transfer through the presentation.</li></ol>																							
<b>Assessment Details (both CIE and SEE)</b> <table><tr><th colspan="2">Component</th><th colspan="2">Weightage (%)</th></tr><tr><td>IAT 1</td><td>25</td><td rowspan="2">Scaled to 15</td><td rowspan="2">60%</td></tr><tr><td>IAT 2</td><td>25</td></tr><tr><td>CCE 1</td><td>25</td><td rowspan="2">Scaled to 10</td><td rowspan="2">40%</td></tr><tr><td>CCE 2</td><td>25</td></tr><tr><td colspan="4"></td></tr></table>				Component		Weightage (%)		IAT 1	25	Scaled to 15	60%	IAT 2	25	CCE 1	25	Scaled to 10	40%	CCE 2	25				
Component		Weightage (%)																					
IAT 1	25	Scaled to 15	60%																				
IAT 2	25																						
CCE 1	25	Scaled to 10	40%																				
CCE 2	25																						
Suggested Learning Resources: <b>Text Books:</b> <ol style="list-style-type: none"><li>Communication Skills by Sanjay Kumar &amp; Pushp Lata, Oxford University Press India Pvt Ltd - 2019.</li><li>A Textbook of English Language Communication Skills, (ISBN-978-81-955465-2-7), Published by Infinite</li><li>Learning Solutions, Bengaluru - 2022.</li></ol> <b>Reference Books:</b> <ol style="list-style-type: none"><li>Technical Communication by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.</li><li>English for Engineers by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.</li><li>English Language Communication Skills – Lab Manual cum Workbook, Cengage learning India Pvt Limited. [Latest Revised Edition] – (ISBN-978-93-86668-45-5), 2019.</li><li>A Course in Technical English – D Praveen Sam, KN Shoba, Cambridge University Press – 2020.</li><li>Practical English Usage by Michael Swan, Oxford University Press – 2016</li></ol>																							

**CO- PO Mapping:**

POS	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO1	PO1	PO1	PSO	PSO	PSO
COs	1	2	3	4	5	6	7	8	9	0	1	2	1	2	3
1	-	-	-	-	-	-	-	2	2	2	-	3	-	-	-
2	-	-	-	-	-	-	-	2	2	2	-	2	-	-	-
3	-	-	-	-	-	-	-	2	2	3	-	2	-	-	-
4	-	-	-	-	-	-	-	2	3	2	-	2	-	-	-
5	-	-	-	-	-	-	-	3	2	2	-	3	-	-	-

Course Title:	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Course Code:	23KSK17	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01
Total Hours of Pedagogy	25	Credits	01

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:
1. ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಕನ್ನಡ ಭಾಷೆ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಮತ್ತು ಆಧುನಿಕ ಪೂರ್ವ ಕಾವ್ಯಗಳನ್ನು ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು
3. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಹಾಗೂ ಸಾಹಿತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರು ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು
4. ಕನ್ನಡ ಶಬ್ದ ಸಂಪತ್ತಿನ ಪರಿಚಯ ಮತ್ತು ಕನ್ನಡ ಭಾಷೆಯ ಬಳಕೆ ಹಾಗೂ ಕನ್ನಡದಲ್ಲಿ ಪತ್ರ ವ್ಯವಹಾರವನ್ನು ತಿಳಿಸಿಕೊಡುವುದು
<p><b>ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching-Learning Process - General Instructions) :</b></p> <p>These are sample Strategies, which teacher can use to accelerate the attainment of the course outcomes.</p> <ol style="list-style-type: none"> <li>1. ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡವನ್ನು ಬೋಧಿಸಲು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಪ್ರಸ್ತುತ ಪುಸ್ತಕ ಆಧಾರಿಸಿ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನವನ್ನು ಅನುಸರಿಸುವುದು. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಪ್ರೇರೇಪಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.</li> <li>2. ಇತ್ತೀಚಿನ ತಂತ್ರಜ್ಞಾನದ ಅನುಕೂಲಗಳನ್ನು ಬಳಸಿಕೊಳ್ಳುವುದು - ಅಂದರೆ ಕವಿ-ಕಾವ್ಯ ಪರಿಚಯದಲ್ಲಿ ಕವಿಗಳ ಚಿತ್ರಣ ಮತ್ತು ಲೇಖನಗಳು ಮತ್ತು ಕಥೆ ಕಾವ್ಯಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟ ಧ್ವನಿ ಚಿತ್ರಗಳು, ಸಂಭಾಷಣೆಗಳು, ಈಗಾಗಲೇ ಇತರ ವಿಮರ್ಶಕರು ಬರೆದಿರುವ ವಿಮರ್ಶಾತ್ಮಕ ವಿಷಯಗಳನ್ನು ಟಿಪ್ಪಣಿ, ಡಿಜಿಟಲ್ ಮಾಧ್ಯಮಗಳ ಮುಖಾಂತರ ವಿಶ್ಲೇಷಿಸುವುದು.</li> <li>3. ನವೀನ ಮಾದರಿಯ ಸಾಹಿತ್ಯ ಬೋಧನೆಗೆ ಸಂಬಂಧಪಟ್ಟ ವಿಧಾನಗಳನ್ನು ಶಿಕ್ಷಕರು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವ ರೀತಿಯಲ್ಲಿ ಅಳವಡಿಸಿಕೊಳ್ಳಬಹುದು.</li> </ol>

ಘಟಕ-1: ಲೇಖನಗಳು
<p>ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ: ಹಂ. ಪ. ನಾಗರಾಜಯ್ಯ</p> <p>ಕರ್ನಾಟಕದ ಏಕೀಕರಣ: ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ- ಜಿ. ವೆಂಕಟ ಸುಬ್ಬಯ್ಯ</p> <p>ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ: ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ ಮತ್ತು ಪ್ರೊ ವಿ. ಕೇಶವಮೂರ್ತಿ</p>
ಘಟಕ-2: ಆಧುನಿಕ ಪೂರ್ವ ಕಾವ್ಯ ಭಾಗ
<p>ವಚನಗಳು: ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರ ದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ</p> <p>ಕೀರ್ತನೆಗಳು: ಅದರಿದೇನು ಫಲ- ಪುರಂದರದಾಸರು</p> <p>ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ- ಕನಕದಾಸರು</p> <p>ತತ್ವಪದಗಳು: ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು -ಶಿಶುನಾಳ ಶರೀಫ</p>
ಘಟಕ-3: ಆಧುನಿಕ ಕಾವ್ಯ ಭಾಗ
<p>ದಿವಿಜಿ ಅವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ ಆಯುಧ ಕೆಲವು ಭಾಗಗಳು</p> <p>ಕುರುಡು ಕಾಂಚಾಣ-ದ. ರಾ. ಬೇಂದ್ರೆ</p> <p>ಹೊಸಬಾಳಿನ ಗೀತೆ- ಕುವೆಂಪು</p>

ಘಟಕ-4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ
ಡಾ. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ ವ್ಯಕ್ತಿ ಮತ್ತು ಐಪಿಸಿಯ ಐತಿಹ್ಯ- ಎ.ಎನ್. ಮೂರ್ತಿರಾವ್ ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ- ಕರಿಗೌಡ ಬೀಚಿನಹಳ್ಳಿ
ಘಟಕ-5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ
ಯುಗಾದಿ- ವಸುಧೇಂದ್ರ ಪರ್ವತ ಮೇಘಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ- ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ
<p><b>ಪಠ್ಯಪುಸ್ತಕ :</b></p> <p><b>ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ</b></p> <p>ಡಾ. ಹಿ.ಚಿ.ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ, ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.</p>

#### COURSE EVALUATION SCHEME:

Component		Weightage (%)			
IAT-1	Internal Tests	25	25	50	
IAT-2		25			
CCE-1	Internal Assignments	25	25		
CCE-2		25			
SEE- 100 : Reduced to 50					
Total : CIE+ SEE= 100					

#### ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು

CO1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ, ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ
CO2	ಕನ್ನಡದ ಆಧುನಿಕ ಸಾಹಿತ್ಯ ಹಾಗೂ ಆಧುನಿಕ ಪೂರ್ವ ಸಾಹಿತ್ಯ ಪರಿಚಯ
CO3	ಸಾಹಿತಿಗಳ, ಕವಿಗಳ ಹಾಗೂ ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ
CO4	ಆಡಳಿತ ಭಾಷೆಯ ಪದಗಳ ಪರಿಚಯ ಹಾಗೂ ಕಥೆಗಳ ಬಗ್ಗೆ ಆಸಕ್ತಿ

#### COs and POs Mapping

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C107.1									3	2		
C107.2									3	2		
C107.3								2	3	2		
C107.4									3	2		1



<p>ಬಳಕೆ ಕನ್ನಡ BaLake Kannada (Kannada for Usage)</p> <p>ಕನ್ನಡ ಕಲಿಕೆಗಾಗಿ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಪುಸ್ತಕ - (Prescribed Textbook to Learn Kannada)</p>			
ವಿಷಯ ಸಂಕೇತ (Course Code)	23KBK17/27	ನಿರಂತರ ಅಂತರಿಕ ಮೌಲ್ಯಮಾಪನದ ಅಂಕಗಳು (Continuous Internal Evaluation Marks)	50
ಒಂದು ವಾರಕ್ಕೆ ಬೋಧನಾ ಅವಧಿ (Teaching Hours/Week (L:T:P:S))	1:0:0:0	ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯ ಅಂಕಗಳು (Semester End Examination Marks)	50
ಒಟ್ಟು ಬೋಧನಾ ಅವಧಿ Total Hours of Pedagogy	16 ಗಂಟೆಗಳು	ಒಟ್ಟು ಅಂಕಗಳು (Total Marks)	100
Credits	01	ಪರೀಕ್ಷೆಯ ಅವಧಿ (Exam Hours)	2 ಗಂಟೆ
<p>ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು (Course Learning Objectives)</p> <ul style="list-style-type: none"> <li>To create awareness regarding the necessity of learning the local language for a comfortable and healthy life.</li> <li>To enable learners to Listen and understand the Kannada language properly.</li> <li>To speak, read and write the Kannada language as per requirement.</li> <li>To train the learners for correct and polite conversation</li> </ul>			
<p>ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವ್ಯವಸ್ಥೆ (Teaching – Learning Process – General Instructions):</p> <p>These are sample strategies which teachers can use to accelerate the attainment of the course outcomes.</p> <ol style="list-style-type: none"> <li>ಬಳಕೆ ಕನ್ನಡವನ್ನು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಬೋಧಿಸಲು ಸೂಚಿಸಿದ ಪಠ್ಯಪುಸ್ತಕವನ್ನು ಉಪಯೋಗಿಸಬೇಕು.</li> <li>ಪ್ರಮುಖ ಅಂಶಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಉತ್ತೇಜಿಸುವುದು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.</li> <li>ಪ್ರತಿ ವಿದ್ಯಾರ್ಥಿ ಪುಸ್ತಕವನ್ನು ತರಗತಿಯಲ್ಲಿ ಬಳಸುವಂತೆ ನೋಡಿಕೊಳ್ಳುವುದು ಮತ್ತು ಪ್ರತಿ ಪಾಠ ಮತ್ತು ಪ್ರವಚನಗಳ ಮೂಲಕ ವಿಷಯಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಪೂರಕ ಚಟುವಟಿಕೆಗಳಿಗೆ ತೊಡಗಿಸು ತಕ್ಕದ್ದು.</li> <li>ಡಿಜಿಟಲ್ ತಂತ್ರಜ್ಞಾನ ಮುಖಾಂತರ ಇತ್ತೀಚೆಗೆ ಡಿಜಿಟಲೀಕರಣ ಭಾಷೆ ಕಲಿಕೆಯ ವಿಧಾನಗಳನ್ನು ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ಮುಖಾಂತರ ಚರ್ಚಿಸಲು ಕ್ರಮಕೈಗೊಳ್ಳುವುದು ಇದರಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ತರಗತಿಯಲ್ಲಿ ಏಕಾಗ್ರತೆಯಿಂದ ಪಾಠ ಕೇಳಲು ಮತ್ತು ಅಧ್ಯಯನದಲ್ಲಿ ತೊಡಗಲು ಅನುಕೂಲವಾಗುತ್ತದೆ.</li> <li>ಭಾಷಾ ಕಲಿಕೆಯ ಪ್ರಯೋಗಾಲಯದ ಮುಖಾಂತರ ಬಹುಬೇಗ ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಕಲಿಯಲು ಅನುಕೂಲವಾಗುವಂತೆ ಕಾರ್ಯಚಟುವಟಿಕೆಗಳನ್ನು ಮತ್ತು ಕ್ರಿಯಾ ಯೋಜನೆಗಳನ್ನು ರೂಪಿಸುವುದು.</li> </ol>			
<b>Module – 1</b>			<b>03 hours</b>
<ol style="list-style-type: none"> <li>Introduction, Necessity of Learning a local language, Methods to learn the Kannada language.</li> <li>Easy learning of a Kannada Language: A few tips. Hints for correct and polite and polite conversation Listening and Speaking Activities.</li> <li>Key to Transcription</li> <li>ವೈಯಕ್ತಿಕ ಸ್ವಾಮ್ಯಸೂಚಕ ಸಂಬಂಧಿತ ಸರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು- Personal Pronouns, Possessive Forms, Interrogative words.</li> </ol>			

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ಪೋರ್ಟ್ ವಿಧಾನ ಪ್ರಮುಖ ಅಂಶಗಳು ಚಾರ್ಟ್ ಗಳನ್ನು ಬೆಳೆಸುವುದು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು
<b>Module – 2</b>	
<b>03 hours</b>	
<ol style="list-style-type: none"> <li>1. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು – Possessive forms of nouns, dubitive question and Relative nouns.</li> <li>2. ಗುಣ ಪರಿಮಾಣ ವಿಶೇಷಣಗಳ ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and colour Adjectives Numerals.</li> <li>3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - ( ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case.</li> </ol>	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ಪೋರ್ಟ್ ವಿಧಾನ ಪ್ರಮುಖ ಅಂಶಗಳು ಚಾರ್ಟ್ ಗಳನ್ನು ಬೆಳೆಸುವುದು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು
<b>Module – 3</b>	
<b>03 hours</b>	
<ol style="list-style-type: none"> <li>1. ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು – Dative Cases and Numerals</li> <li>2. ಸಂಖ್ಯೆ ಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು – Ordinal numerals and Plural markers.</li> <li>3. ನ್ಯೂನ ನಿಷೇದಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು ಮತ್ತು ವರ್ಣ ಗುಣವಾಚಕಗಳು – Defective/ Negative Verbs and colour Adjectives.</li> </ol>	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ಪೋರ್ಟ್ ವಿಧಾನ ಪ್ರಮುಖ ಅಂಶಗಳು ಚಾರ್ಟ್ ಗಳನ್ನು ಬೆಳೆಸುವುದು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು
<b>Module – 4</b>	
<b>03 hours</b>	
<ol style="list-style-type: none"> <li>1. ಅಪ್ಪಣೆ /ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ,ಪ್ರೋತ್ಸಾಹ ಮತ್ತು ಒತ್ತಾಯ ಅರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು Permission, Commands, encouraging and Urging words (Imperative words and sentences)</li> <li>2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು Accusative Cases and Potential Forms used in General Communication</li> <li>3. “ಇರು ಮತ್ತು ಇರಲ್ಲ” ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯ ಸೂಚಕ ಮತ್ತು ನಿಷೇದಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು Helping Verbs “iru and iralla”, Corresponding Future and Negation Verbs</li> <li>4. ಹೋಲಿಕೆ (ತರತಮ), ಸಂಬಂಧಸೂಚಕ, ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇದಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ Comparitive, Relationship, Identification and Negation words.</li> </ol>	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ಪೋರ್ಟ್ ವಿಧಾನ ಪ್ರಮುಖ ಅಂಶಗಳು ಚಾರ್ಟ್ ಗಳನ್ನು ಬೆಳೆಸುವುದು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು
<b>Module – 5</b>	
<b>03 hours</b>	
<ol style="list-style-type: none"> <li>1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು- Different types of tens, time and verbs. Negation Verbs.</li> <li>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.</li> <li>3. Kannada Vocabulary list: ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು – Kannada words in conversation.</li> </ol>	

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ಪೋರ್ಟ್ ವಿಧಾನ ಪ್ರಮುಖ ಅಂಶಗಳು ಚಾರ್ಟ್ ಗಳನ್ನು ಬೆಳೆಸುವುದು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು
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ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಾಂಶಗಳು

At the end of the course, The Student will be able to:

1. To understand the necessity of learning of local language for comfortable life.
2. To listen and understand the Kannada language properly
3. To speak, read and write the Kannada language as per requirement.
4. To communicate (converse) in the Kannada language in their daily with Kannada speakers.
5. To speak in polite conversation./

#### Assessment Details (both CIE and SEE)

Theory Courses : 1 Credit						
Evaluation Type		Component	Max. Marks	Marks reduced to	Min. Marks	Evaluation Details
Theory Component	Internal Assessment Tests (IAT)	IAT-1	25	25	20	Average of two IAT's Scaled down to 25 marks
		IAT-2	25			
	Comprehensive Continuous Evaluation(CCE)	CCE-1	25	25		Minimum of two Assessment methods as per 22OB4.2 of regulation, Average of two CCE's scaled down to 25 marks
		CCE-2	25			
	Total CIE - Theory			50	20	Scale down marks of IAT and CCE to 50
	Total CIE – (Theory + Lab)			50	20	
	SEE (MCQ Type)		100	50	18	MCQ Type Question paper of 50 questions. Examination duration is 2 hours.
	CIE + SEE			100	40	

#### ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯು ಈ ಕೆಳಗಿನಂತಿರುತ್ತದೆ Semester End Exam (SEE)

SEE will be conducted by the College as per the scheduled timetable, with common question paper from the subject.

1. The question paper will have 50 questions. Each question is set for the 02 mark.
2. SEE Pattern will be in MCQ model for 100 marks Duration of the exam is 02 Hour.

Text Book :

ಬಳಕೆ ಕನ್ನಡ

ಲೇಖಕರು : ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ,

ಪ್ರಸಾರಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ ಬೆಳಗಾವಿ.

CO-PO MAPPING FOR BALAKE KANNADA

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

## INNOVATION AND DESIGN THINKING

Course Code	L:T:P: S	CIE Marks	SEE Marks	Total Marks	Exam Hours
23IDT18/28	1:0:0:0	50	50	100	01
Total Hours of Pedagogy		15	Credits		01

**Course Learning Objectives:**

The course will enable the students to

1. Understand the fundamental concept of innovation and design thinking.
2. Brief the basic concepts and techniques of analysis.
3. Explain the concept of business process modelling in agile environment.
4. Understand the strategies in design thinking and innovations.
5. Discuss the methods of implementing design thinking in the real world.

**Module-1 (3 hours)****Process of Design:**

Understanding Design Thinking, Shared Model in team, based Design, Theory and practice in design thinking, explore presentations and signers across globe, MVP or prototyping.

**Module-2 (3 hours)****Tools for Design Thinking:**

Real-time design interaction capture and analysis, Enabling efficient collaboration in digital space, empathy for design, collaboration in disturbed design.

**Module-3 (3 hours)****Design thinking in IT:**

Design thinking to business process modelling, agile in virtual collaboration environment, scenario based prototyping.

**Module-4 (3 hours)****Design thinking for strategic innovations:**

Growth, storytelling representation, strategic foresight, change, sense making, maintenance relevance, value redefinition, extreme competition, experience design, standardization, humanization, creative culture, rapid prototyping, strategy and organization, business model design.

**Module-5 (3 hours)****Design thinking workshop:**

Design thinking workshop Empathize, Design, Ideate, Prototype and Test.

**Course Outcomes:**

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

1. Appreciate various design process procedure.
2. Analysis the problem with different techniques.
3. Generate and develop business process modelling scenario-based prototyping.
4. Identify the strategies followed in various fields of design thinking.
5. Draw technical drawing for design ideas.

**Assessment Details both (CIE and SEE):****Scheme of Evaluation****Continuous Internal Evaluation (CIE) :**

IAT-1 at the end of 8 <sup>th</sup> Week	-	25 marks
IAT-2 at the end of 13 <sup>th</sup> Week	-	25 marks
CCE-1 at the end of 4 <sup>th</sup> Week	-	25 marks
CCE-2 at the end of 9 <sup>th</sup> Week		25 marks
Total		100 Marks

The average of two IAT1 scaled down to 25 marks and average of two CCE's scaled down to 25 marks shall be considered as CIE marks of the course

**Semester End Examination (SEE):**

- The question paper shall be set for 50 marks. The duration of SEE is 01 hour.
- The question paper will have 50 questions. The pattern of question paper is MCQ.

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

1. John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design", Cengage Learning (International edition) Second Edition, 2013.
2. Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press, 2009. Third Edition, 2012.
3. Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011.
4. Idris Mootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

**Reference Books:**

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

**Web links and Video Lectures (e-Resources):**

- [www.tutor2u.net/business/presentations/. /productlifecycle/default.html](http://www.tutor2u.net/business/presentations/. /productlifecycle/default.html)
- [https://docs.oracle.com/cd/E11108\\_02/otn/pdf/. /E11087\\_01.pdf](https://docs.oracle.com/cd/E11108_02/otn/pdf/. /E11087_01.pdf)
- [www.bizfilings.com > Home > Marketing > Product Development](http://www.bizfilings.com > Home > Marketing > Product Development)
- <https://www.mindtools.com/brainstm.html>
- <https://www.quickspout.com/. /how-to-reverse-engineer-your-competition>
- [www.vertabelo.com/blog/documentation/reverse-engineering](http://www.vertabelo.com/blog/documentation/reverse-engineering)
- <https://support.microsoft.com/en-us/kb/273814>
- <https://support.google.com/docs/answer/179740?hl=en>
- <https://www.youtube.com/watch?v=2mjSDIBaUIM>
- [thevirtualinstructor.com/foreshortening.html](http://thevirtualinstructor.com/foreshortening.html)

- <https://dschool.stanford.edu/.../designresources/.../ModeGuideBOOTCAMP2010L.pdf>
- <https://dschool.stanford.edu/use-our-methods/> 6. <https://www.interactiondesign.org/literature/article/5-stages-in-the-design-thinking-process> 7.
- <http://www.creativityatwork.com/design-thinking-strategy-for-innovation/> 49 8.
- <https://www.nngroup.com/articles/design-thinking/> 9.
- <https://designthinkingforeducators.com/design-thinking/> 10.

- [www.designthinkingformobility.org/wp-content/.../10/NapkinPitch\\_Worksheet.pdf](http://www.designthinkingformobility.org/wp-content/.../10/NapkinPitch_Worksheet.pdf)

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

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

**COs and POs Mapping (CO-PO mappings are only Indicative)**

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

**Level 3-HighlyMapped, Level2-ModeratelyMapped,Level 1-Low Mapped, Level 0- Not Mapped**