



|| 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- Civil Engineering  
(CV 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**

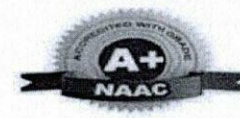
*Managing Director, BGS & SJB Group of Institutions & Hospitals*



**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.**







## AUTONOMOUS SCHEME (Tentative) UG - BE First Year CV

**SCHEME: 2023**  
**SEM: I**

**Aca. Year.: 2023-24**

**Date: 18/11/2023**

SL No	Course Type	Course type Series	Course Code	Course Title	Teaching Dept.	QP setting dept	Credits	Teaching Hrs/Week				Examinations				
								L	T	P	S	CIE Marks	SEE			Tot. Marks
								Lecture	Tutorial	Practical	PBL/ABL/SL/others.		Dur.	Th. Mrks	Lab. Mrks.	
<b>PHYSICS CYCLE</b>																
1	BSC	1	23MAT11C	Calculus and Linear Algebra	Maths	Maths	4	3	2	0		50	03	50	-	100
2	IBSC	1	23PHI12C	Physics of Material Designing	PHY	PHY	4	2	2	2		50	03	50	-	100
3	ESC	1	23EET13C	Introduction to Electrical Engineering	EEE	EEE	3	3	0	0		50	03	50	-	100
4	ESC	2	23MET14C	Mechanical Engineering Science	ME	ME	3	3	0	0		50	03	50	-	100
5	IESC	1	23CPI15C	Principles of C Programming	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	Personality Development-1 (HRD Training)	I.E.	I.E.	PP/NP	0	0	0	2	50	-	0	-	50
9	AEC	1	23CVAE11	Skill Development Course - 1 (EWDP)	I.E.	I.E.	1	1	0	0	2	50	02	50	-	100
<b>SEM-I Total</b>							<b>20</b>	<b>16</b>	<b>5</b>	<b>7</b>	<b>4</b>	<b>450</b>		<b>350</b>	<b>0</b>	<b>800</b>
<b>CHEMISTRY CYCLE</b>																
1	BSC	2	23MAT11C	Calculus and Linear Algebra	Maths	Maths	4	3	2	0		50	03	50	-	100
2	IBSC	2	23CHI12C	Engineering materials and Environmental Chemistry	CHE	CHE	4	2	2	2		50	03	50	-	100
3	ESC	3	23ECT13C	Principles of Electronics	ECE	ECE	3	3	0	0		50	03	50	-	100
4	ESC	4	23CVT14C	Engineering Mechanics	CV	CV	3	3	0	0		50	03	50	-	100
5	IESC	2	23CDI15C	Computer Aided Drawing for Engineers	CV/ME	CV/ME	4	3	0	2		50	03	0	50	100
6	HSMC	3	23SKAH03 23BKAH04	Sanskritika Kannada / Balake Kannada	HSS	HSS	PP/NP	1	0	0		50	-	0	-	50
7	HSMC	4	23CIPH05	Constitution of India & Professional Ethics	HSS	HSS	1	1	0	0	@	50	02	50	-	100
8	NCMC	1	23PDSN01	Personality Development-1 (HRD Training)	I.E.	I.E.	PP/NP	0	0	0	2	50	-	0	-	50
9	AEC	1	23CVAE11	Skill Development Course - 1 (EWDP)	I.E.	I.E.	1	1	0	0	2	50	02	50	-	100
<b>SEM-I Total</b>							<b>20</b>	<b>17</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>450</b>		<b>300</b>	<b>50</b>	<b>800</b>

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

*bbu*  
18/11/23  
Dr. BABU N V  
Prof. & Academic Dean

SJB Institute of Technology  
BGS Health & Education City  
Kengeri, Bengaluru-560060

Principal

SJB Institute of Technology  
# 67, BGS Health & Education Cit  
BGS Health & Education City, Bengaluru-560060

25/11/23





## AUTONOMOUS SCHEME (Tentative) UG - BE First Year CV

**SCHEME: 2023**  
**SEM: II**

**Aca. Year.: 2023-24**

**Date: 18/11/2023**

SL No	Course Type	Course type Series	Course Code	Course Title	Teaching Dept.	QP setting dept	Credits	Teaching Hrs/Week				Examinations				
								L	T	P	S	CIE Marks	SEE			Tot. Marks
								Lecture	Tutorial	Practical	PBL/ABL/SL/othrs.		Dur.	Th. Mrks.	Lab. Mrks.	
<b>CHEMISTRY CYCLE</b>																
1	BSC	2	23MAT21C	Vector Calculus and Differnetial Equations	Maths	Maths	4	3	2	0		50	03	50	-	100
2	IBSC	2	23CHI22C	Engineering materials and Environmental Chemistry	CHE	CHE	4	2	2	2		50	03	50	-	100
3	ESC	3	23ECT23C	Principles of Electronics	ECE	ECE	3	3	0	0		50	03	50	-	100
4	ESC	4	23CVT24C	Engineering Mechanics	CV	CV	3	3	0	0		50	03	50	-	100
5	IESC	2	23CDI25C	Computer Aided Drawing for Engineers	CV/ME	CV/ME	4	3	0	2		50	03	0	50	100
6	HSMC	3	23SKAH03 23BKAH04	Samskrutika Kannada / Balake Kannada	HSS	HSS	PP/NP	1	0	0		50	-	0	-	50
7	HSMC	4	23CIPH05	Constitution of India & Professional Ethics	HSS	HSS	1	1	0	0	@	50	02	50	-	100
8	NCMC	2	23PDSN02	Personality Development-2 (HRD Training)	I.E.	I.E.	PP/NP	0	0	0	2	50	-	0	-	50
9	AEC	2	23CVAE21	Skill Development Course - 2 (EWDP)	I.E.	I.E.	1	1	0	0	2	50	02	50	-	100
<b>SEM-II Total</b>							<b>20</b>	<b>17</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>450</b>		<b>300</b>	<b>50</b>	<b>800</b>
<b>PHYSICS CYCLE</b>																
1	BSC	1	23MAT21C	Vector Calculus and Differnetial Equations	Maths	Maths	4	3	2	0		50	03	50	-	100
2	IBSC	1	23PHI22C	Physics of Material Designing	PHY	PHY	4	2	2	2		50	03	50	-	100
3	ESC	1	23EET23C	Introduction to Electrical Engineering	EEE	EEE	3	3	0	0		50	03	50	-	100
4	ESC	2	23MET24C	Mechanical Engineering Science	ME	ME	3	3	0	0		50	03	50	-	100
5	IESC	1	23CPI25C	Principles of C Programming	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	2	23PDSN02	Personality Development-2 (HRD Training)	I.E.	I.E.	PP/NP	0	0	0	2	50	-	0	-	50
9	AEC	2	23CVAE21	Skill Development Course - 2 (EWDP)	I.E.	I.E.	1	1	0	0	2	50	02	50	-	100
<b>SEM-II Total</b>							<b>20</b>	<b>16</b>	<b>5</b>	<b>7</b>	<b>4</b>	<b>450</b>		<b>350</b>	<b>0</b>	<b>800</b>

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

*18/11/2023*

**Dr. BABU. N.V**

Prof & Academic Dean  
SJB Institute of Technology  
BGS Health & Education City  
Kengeri, Bengaluru, 560060

*Principal*

SJB Institute of Technology  
# 67, BGS Health & Education City





<b>Table of Contents</b>			
<b>Sl. No</b>	<b>Subject code</b>	<b>Subject</b>	<b>Pg No</b>
1	23MAT11C	Calculus and Linear Algebra	1 to 3
2	23MAT21C	Vector Calculus and Differential Equations	4 to 6
3	23EET13C/23EET23C	Introduction to Electrical Engineering	7 to 10
4	23ECT13/23C	Principles of Electronics	11 to 14
5	23MET14C/24C	Mechanical Engineering Science	15 to 17
6	23CVT14C/24C	Engineering Mechanics	18 to 20
7	23CPI15C/25C	Principles of C Programming	21 to 23
8	23CDI15C/25C	Computer Aided Drawing for Engineers	24 to 26
9	23PHI12C/22C	Physics of Material Designing	27 to 30
10	23CHI12C/22C	Engineering materials and Environmental Chemistry	31 to 34
11	23BKAH04	Balake Kannada (Kannada for Usage)	35 to 37
12	23SKAH03	Samskrutika Kannada	38 to 39
13	23ENGH01	Professional Skills and English	40 to 42
14	23CIPH05	Constitution of India & Professional Ethics	43 to 45
15	23ENVH02	Environmental Studies	46 to 48
16	23PDSN01	Personality Development-1	49 to 51
17	23PDSN02	Personality Development-2	52 to 54
18	23CVAE11	Skill Development Course – 1: WEB 2.0 (HTML, CSS & JAVASCRIPT)	55 to 57
19	23CVAE21	Skill Development Course – 2:Python	<u>58 to 60</u>
20	—————	Annexure-CIE & SEE Guidelines	61 to 71



|| Jai Sri Gurudev ||  
Sri Adichunchanagiri Shikshana Trust (R)  
**SJB Institute of Technology**

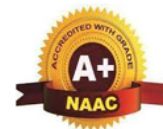
BGS Health and Education City, Dr. Vishnuvardhana Road, Kengeri, Bengaluru-560060

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)



<b>Semester:</b>	I	<b>Course Type:</b>	BSC
<b>Course Title:</b> Calculus and Linear Algebra			
<b>Course Code:</b>	23MAT11C	<b>Credits:</b>	4
<b>Teaching Hours/Week (L:T:P:O)</b>	3:2:0:0	<b>Total Hours:</b>	50
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50
<b>SEE Type:</b>	Theory	<b>Total Marks:</b>	100
		<b>Exam Hours:</b>	3
<b>I. Course Objectives:</b>			
<ol style="list-style-type: none"> <li>To facilitate the students with a concrete foundation of differential calculus.</li> <li>To develop the knowledge of matrices and linear algebra in comprehensive manner.</li> </ol>			
<b>II. Teaching-Learning Process (General Instructions):</b>			
<ol style="list-style-type: none"> <li>In addition to the traditional lecture method, innovative teaching methods shall be adopted.</li> <li>State the need for Mathematics with Engineering Studies and Provide real-life examples.</li> <li>Grading assignments and quizzes and documenting students' progress.</li> <li>Encourage the students for group learning to improve their creative and analytical skills.</li> </ol>			
<b>Pre-requisites</b>			
<ol style="list-style-type: none"> <li>Trigonometric formulae.</li> <li>Differentiation, Integration and properties.</li> <li>Basic knowledge of Matrix operations.</li> </ol>			
<b>III. COURSE CONTENT</b>			
<b>Module-1: Single variable calculus</b>			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. Evaluation of Indeterminate forms: evaluation of limits of the form $1^\infty, 0^0, \infty^0$ .			
<b>Textbook: Chapter: sections:</b> Discussion restricted to derivation and problems as suggested in articles No.4.7(1, 2), 4.8, 4.10, 4.11(1, 5), 4.5(III) of Textbook 1.			
<b>Self Study:</b> Radius of curvature in parametric and polar form.			
<b>RBT Levels:</b> L1, L2 and L3.			
<b>Module-2: Series expansion and Multivariable calculus</b>			10 Hours
Taylor's and Maclaurin's series expansions for one variable (statement only)-Problems. Partial differentiation; Definition and simple problems, Total derivatives – differentiation of composite functions. Jacobians-definition, properties and problems. Maxima and minima for a function of two variables.			
<b>Textbook: Chapter: sections:</b> Discussion and coverage of contents as suggested in articles 5.2, 5.5(1, 2), 5.7 (1), 5.11 of Textbook 1.			
<b>Self Study:</b> Method of Lagrange's undetermined multipliers with a single constraint.			
<b>RBT Levels:</b> L1, L2 and L3.			

<b>Module-3: Integral calculus</b>													10 Hours			
<b>Multiple Integrals:</b> 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. <b>Beta and Gamma functions:</b> Definitions, properties, relation between Beta and Gamma functions. Problems.																
<b>Textbook: Chapter: Sections:</b> Discussion and coverage of contents as suggested in articles.7.1 to 7.5, 7.14, 7.15 & 7.16 of Textbook 1.																
<b>Self Study:</b> Application to find Volume.																
<b>RBT Levels:</b> L1, L2 and L3																
<b>Module-4: Ordinary Differential Equations (ODEs) of First Order</b>													10 Hours			
Linear and Bernoulli's differential equations. Exact differential equations. Orthogonal trajectories (Cartesian form only). Applications: Newton's law of cooling. Nonlinear differential equations: Introduction to general and singular solutions; Solvable for $p$ only ; Clairaut's equation.																
<b>Textbook: Chapter: Sections</b> Discussion and coverage of contents as suggested in articles 11.9 (only for introduction), 11.10, 11.11, 12.3 (1, 2), 12.6, 11.13(1) and 11.14 of Textbook 1.																
<b>Self Study:</b> Reducible to exact differential equations. Orthogonal trajectories – polar form.																
<b>RBT Levels:</b> L1, L2 and L3.																
<b>Module-5: Linear Algebra</b>													Hrs:10			
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.																
<b>Textbook: Chapter: Sections:</b> 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 book1.																
<b>Self Study:</b> LU decomposition method, Gauss-Jordan method.																
<b>RBT Levels:</b> L1, L2 and L3.																
<b>IV. COURSE OUTCOMES</b>																
<b>CO1</b>		Apply the knowledge of single variable calculus to solve the problems on polar curves and evaluation of indeterminate forms.														
<b>CO2</b>		Apply the knowledge of multivariable calculus to solve the problems on partial differentiation, composite functions and Jacobian.														
<b>CO3</b>		Apply the concept of change of order of integration and change of variables to evaluate multiple integrals to find area and volume.														
<b>CO4</b>		Analyze the solution of linear and non-linear ordinary differential equations.														
<b>CO5</b>		Make use of matrix theory for solving the system of linear equations and compute eigen values and eigen vectors.														
<b>V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
<b>PO/PSO</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>
<b>CO1</b>	3	2										1				
<b>CO2</b>	3	2										1				
<b>CO3</b>	3	2										1				



<b>CO4</b>	3	2										1			
<b>CO5</b>	3	2										1			
<b>VI. Assessment Details (CIE &amp; SEE)</b>															
<b>General Rules:</b> Refer Annexure section 1															
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure section 1															
<b>Semester End Examination (SEE):</b> Refer Annexure section 1															
<b>VII. Learning Resources</b>															
<b>VII(a): Textbooks:</b>															
<b>Sl. No.</b>	<b>Title of the Book</b>					<b>Name of the author</b>			<b>Name of the publisher</b>			<b>Edition and Year</b>			
1	Higher Engineering Mathematics					B.S. Grewal			Khanna Publishers			44 <sup>th</sup> Ed., 2018.			
<b>VII(b): Reference Books:</b>															
1	Advanced Engineering Mathematics					E. Kreyszig			John Wiley & Sons			10 <sup>th</sup> Ed., 2016			
2	A Textbook of Engineering Mathematics					N.P Bali and Manish Goyal			Laxmi Publications			10 <sup>th</sup> Ed., 2022			
3	Higher Engineering Mathematics					B.V.Ramana			Tata Mc Graw-Hill			11 <sup>th</sup> Ed., 2017			
4	Linear Algebra and its Applications					Gilbert Strang			Cengage Publications			4 <sup>th</sup> Ed., 2022.			
5	Linear Algebra and its Applications					David C Lay			Pearson Publishers			4 <sup>th</sup> Ed., 2018.			
<b>VII(c): Web links and Video Lectures (e-Resources):</b>															
<ol style="list-style-type: none"> <li>1. <a href="http://nptel.ac.in/courses.php?disciplineID=111">http://nptel.ac.in/courses.php?disciplineID=111</a></li> <li>2. <a href="http://www.class-central-central.com/subject/math(MOOCs)">http://www.class-central-central.com/subject/math(MOOCs)</a></li> <li>3. <a href="http://academicarth.org/">http://academicarth.org/</a></li> <li>4. VTU EDUSAT programme-20</li> </ol>															
<b>VIII: Activity Based Learning</b>															
Assignments, quiz, Presentation.															



|| 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)



<b>Semester:</b>	II	<b>Course Type:</b>	BSC
<b>Course Title:</b> Vector Calculus and Differential Equations			
<b>Course Code:</b>	23MAT21C	<b>Credits:</b>	4
<b>Teaching Hours/Week (L:T:P:O)</b>		3:2:0:0	<b>Total Hours:</b> 50
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50
		<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory		<b>Exam Hours:</b> 3
<b>I. Course Objectives:</b>			
<ol style="list-style-type: none"> <li>1. Familiarize the importance of ordinary and partial differential equations.</li> <li>2. Apply the knowledge vector calculus to solve engineering problems.</li> <li>3. Develop the knowledge of numerical methods and apply them to solve transcendental and differential equations.</li> </ol>			
<b>II. Teaching-Learning Process (General Instructions):</b>			
<ol style="list-style-type: none"> <li>1. In addition to the traditional lecture method, innovative teaching methods shall be adopted.</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. 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> </ol>			
<b>Pre-requisites:</b>			
<ol style="list-style-type: none"> <li>1. Trigonometric formulae.</li> <li>2. Differentiation, Integration and properties.</li> <li>3. Basic knowledge of Scalars and Vectors.</li> </ol>			
<b>III. COURSE CONTENT</b>			
<b>Module-1: Differential equations of higher order</b>			10 Hours
Second order linear ODE's with constant coefficients – Inverse differential operators, evaluation of homogeneous equations, Non homogeneous equations ( $e^{ax}$ , $\sin ax$ or $\cos ax$ , <i>polynomial</i> ), method of variation of parameters, Cauchy's and Legendre linear equations. Applications: Simple pendulum.			
<b>Textbook: Chapter: sections:</b> Discussion and coverage of contents as suggested in articles 13.1 to 13.6, 13.8, 13.9, 14.3(1) of Textbook 1.			
<b>Self study:</b> LCR circuits and oscillation of a spring.			
<b>RBT Levels:</b> L1, L2 and L3.			
<b>Module-2: Partial Differential equations(PDE's):</b>			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.			



<b>Textbook: Chapter: Sections:</b> 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.	
<b>Self study:</b> Solution of non-homogeneous Partial differential equations by direct integration, Homogeneous Partial differential equations involving derivative with respect to one independent variable.	
<b>RBT Levels:</b> L1, L2 and L3.	
<b>Module-3: Vector calculus</b>	10 Hours
<b>Vector Differentiation:</b> Scalar and vector fields. Gradient, directional derivative, curl and divergence - physical interpretation, Solenoidal and Irrotational vector fields, Problems. Vector Identities. <b>Vector Integration:</b> Line integrals, Surface integrals. Applications to work done by a force and flux. Green's theorem (statement only), problems.	
<b>Textbook: Chapter: sections:</b> Discussion and coverage of contents as suggested in articles 8.1, 8.4, 8.5, 8.6, 8.7, 8.8, 8.11, 8.12, 8.13, and 8.18(1, 2) of Textbook 1.	
<b>RBT Levels:</b> L1, L2 and L3.	
<b>Module-4: Numerical Methods</b>	10 Hours
Solution of algebraic and transcendental equations: Newton-Raphson method. <b>Finite Differences and Interpolation:</b> 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. <b>Numerical Integration:</b> Simpson 1/3rd rule and Simpson 3/8th rule.	
<b>Textbook: Chapter: sections:</b> 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.	
<b>Self study:</b> Regula-falsi method and Trapezoidal rule.	
<b>RBT Levels:</b> L1, L2 and L3.	
<b>Module-5: Numerical Solution of Ordinary Differential Equations (ODEs):</b>	10 Hours
Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor corrector formula (No derivations), problems. Numerical solution of ordinary differential equations of second order and first degree: Milne's method.	
<b>Textbook: Chapter: sections:</b> Discussion and coverage of contents as suggested in articles 32.3, 32.5, 32.7, 32.9, 32.12 of Textbook 1.	
<b>Self Study:</b> Numerical solution of ordinary differential equations of second order and first degree Runge-Kutta method of fourth order.	
<b>RBT Levels:</b> L1, L2 and L3	
<b>IV. COURSE OUTCOMES</b>	
<b>CO1</b>	Solve higher order linear ordinary differential equations analytically using standard methods.
<b>CO2</b>	Demonstrate partial differential equations and their solutions for physical interpretations.
<b>CO3</b>	Understand the applications of vector calculus refer to Solenoidal, Irrotational vectors, line integral and surface integral.

<b>CO4</b>	Use relevant numerical techniques for interpolation. Estimate the missing terms through interpolation methods.																
<b>CO5</b>	Acquire basic knowledge in solving ordinary differential equation of first and second order by Numerical methods.																
<b>V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																	
<b>PO/PSO</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>S1</b>	<b>S2</b>	<b>S3</b>	<b>S4</b>	
<b>CO1</b>	3	2										1					
<b>CO2</b>	3	2										1					
<b>CO3</b>	3	2										1					
<b>CO4</b>	3	2										1					
<b>CO5</b>	3	2										1					
<b>VI. Assessment Details (CIE &amp; SEE)</b>																	
<b>General Rules:</b> Refer Annexure section 1																	
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure section 1																	
<b>Semester End Examination (SEE):</b> Refer Annexure section 1																	
<b>VII. Learning Resources</b>																	
<b>VII(a): Textbooks:</b>																	
<b>Sl. No.</b>	<b>Title of the Book</b>					<b>Name of the author</b>				<b>Name of the publisher</b>				<b>Edition and Year</b>			
1	Higher Engineering Mathematics					B.S. Grewal				Khanna Publishers				44 <sup>th</sup> Ed., 2018.			
<b>VII(b): Reference Books:</b>																	
1	Advanced Engineering Mathematics					E. Kreyszig				John Wiley & Sons				10 <sup>th</sup> Ed., 2016			
2	Introductory Methods of Numerical Analysis					S.S.Sastry				Tata McGraw-Hill				11 <sup>th</sup> Edition			
3	Higher Engineering Mathematics					B.V.Ramana				Tata Mc Graw-Hill				11 <sup>th</sup> Ed., 2017			
4	Calculus					James Stewart				Cengage publications				7 <sup>th</sup> edition, 2019.			
5	A Textbook of Engineering Mathematics					N.P Bali and Manish Goyal				Laxmi Publications				10 <sup>th</sup> Ed., 2022			
<b>VII(c): Web links and Video Lectures (e-Resources):</b>																	
<ol style="list-style-type: none"> <li>1. <a href="http://nptel.ac.in/courses.php?disciplineID=111">http://nptel.ac.in/courses.php?disciplineID=111</a></li> <li>2. <a href="http://www.class-central.com/subject/math(MOOCs)">http://www.class-central.com/subject/math(MOOCs)</a></li> <li>3. <a href="http://academicarth.org/">http://academicarth.org/</a></li> <li>4. VTU EDUSAT programme-20</li> </ol>																	
<b>VIII: Activity Based Learning</b>																	
Assignments, quiz, presentation.																	





|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	ESC		
<b>Course Title:</b> Introduction to Electrical Engineering					
<b>Course Code:</b>	23EET13C/23EET23C				
<b>Teaching Hours/Week (L:T:P:O)</b>		3:0:0:0	<b>Total Hours:</b>	40	
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	3
<b>I. Course Objectives:</b>					
This course will enable students:					
<ol style="list-style-type: none"> <li>1. To understand electricity evolution and electricity invention experiments.</li> <li>2. To have an insights of energy sources and general structure of power system.</li> <li>3. To study the fundamental concepts of AC and analyse DC circuits.</li> <li>4. To understand construction, working and applications of electrical machines.</li> <li>5. To study the domestic wiring, tariff and electrical safety practices.</li> <li>6. To explore concepts of energy audit and energy scenario.</li> </ol>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
Chalk and talk method Power point presentation / keynotes Videos Animations					
<b>III. COURSE CONTENT</b>					
<b>Module-1: History of electricity, and sources of electrical energy</b>					8 Hours
<b>Review history of electricity (Review only):</b> Evolution of electricity & electrical inventions (Benjamin franklin kite experiment, thomas alva edison bulb invention)					
<b>Introduction:</b> Conventional and non-conventional energy resources; general structure of electrical power systems using single line diagram approach.					
<b>Sources of electrical energy-</b> Brief introduction to the electrical generation using thermal, solar, hydro, wind (Block diagram approach).					
<b>Textbook: Chapter: sections:</b>					
<ol style="list-style-type: none"> <li>1. 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</li> <li>2. Power system engineering, Chakrabarty Part-1, chapter-2, section 2.2, Chapter-3, section-3.6, Part-2 Chapter-1,section-1</li> </ol>					
<b>Pre-requisites (Self Learning):</b> Basics of electricity,					
<b>RBT Levels: L1, L2</b>					

<b>Module-2:DC circuits and AC fundamentals</b>	8 Hours
<p><b>DC Circuits:</b> Introduction to DC circuits, ohms law, kirchhoff's laws, concept of power and energy. analysis of series parallel circuits and numerical.</p> <p><b>AC fundamentals:</b> Generation of sinusoidal voltage, concept of phasors, time period, frequency, instantaneous values, peak, average, RMS value, peak factor, and form factor, numerical.</p> <p><b>Textbook: Chapter: sections:</b> 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</p>	
<b>Pre-requisites (Self Learning):</b> Faraday's laws of electromagnetic induction	
<b>RBT Levels: L1, L2, L3</b>	
<b>Module-3: Single-phase transformers and DC motor</b>	8 Hours
<p><b>Single phase transformers:</b> Construction and types, operating principle, EMF equations, losses and efficiency, numerical.</p> <p><b>DC Motor:</b> Principle of operation, back emf and its significance. Torque equation, types of motors, characteristics of DC motors (series &amp; shunt only). Applications of DC motors. Numerical.</p> <p><b>Textbook: Chapter: sections:</b> Basic electrical engineering, D C Kulshreshtha : Chapter 13, Section-13.1,13.2,13.5,13.10</p> <p>Chapter-16 : Section- 16.2, 16.11,16.12,16.13.</p>	
<b>Pre-requisites (Self Learning):</b> Mutual induction principle, fleming's right-hand rule.	
<b>RBT Levels: L1, L2, L3</b>	
<b>Module-4: Domestic wiring and safety measures</b>	8 Hours
<p><b>Domestic Wiring:</b> 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 bill for domestic consumers.</p> <p><b>Safety measures:</b> Working principle of fuse and miniature circuit breaker (MCB), merits and demerits of fuse and MCB, electric shock, safety precautions to avoid shock, earthing and its types.</p> <p><b>Textbook: Chapter: sections:</b> Basic electrical engineering, D C Kulshreshtha : Chapter 19 : Section 19.2 to 19.10.</p>	
<b>Pre-requisites (Self Learning):</b> Fundamentals of single – phase AC supply	
<b>RBT Levels: L1, L2, L3</b>	
<b>Module-5: Energy scenario and introduction to energy audit</b>	8 Hours
<p><b>Energy scenario:</b> Energy sector reforms, energy and environment, energy conservation and its importance, air pollution, climate change.</p> <p><b>Introduction to energy audit:</b> Definition of audit, energy – saving measures in new buildings, general energy – savings tips applicable to new as well as existing buildings.</p>	



**Textbook: Chapter: sections: Energy auditing and demand side management, N G Ajjanna, Chapter-1, Section 1.4,1.9,1.10,1.14, Chapter-3, Section- 3.1 to 3.5**

**Pre-requisites (Self Learning):** Basics of energy

**RBT Levels: L1, L2, L3**

#### IV. COURSE OUTCOMES

At the end of the course students will be able to

<b>CO1</b>	Understand the evolution of electricity, sources of electrical energy and structure of power system.
<b>CO2</b>	Study of basic DC circuits and AC fundamentals
<b>CO3</b>	Explain the construction, types and working of electrical machines.
<b>CO4</b>	Describe the concepts of domestic wiring and safety measures.
<b>CO5</b>	Analyze Energy Scenario and Audit.

#### 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
<b>CO1</b>	3	2	-	-	-	1	1	1	-	-	-	2	2	-	-	-
<b>CO2</b>	3	2	-	-	-	1	1	1	-	-	-	2	2	-	-	-
<b>CO3</b>	3	2	-	-	-	1	1	1	-	-	-	2	2	2	-	-
<b>CO4</b>	3	2	-	-	-	2	2	1	-	-	-	2	2	-	-	-
<b>CO5</b>	3	2	-	-	-	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	Energy auditing and demand side management	N G Ajjanna	1 <sup>st</sup> edition, 2012.	Gowthami Publication
4	Power system engineering	A Chakrabarti , M L Soni	1 <sup>st</sup> edition reprint, 2007	Dhanpat Rai & Co

**VII(b): Reference Books:**

1	A textbook of electrical technology	B.L.Theraja	Reprint edition 2014.	S Chand and Company
2	Basic electrical 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





|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	ESC		
<b>Course Title:</b> Principles of Electronics					
<b>Course Code:</b>	23ECT13C / 23C			<b>Credits:</b>	3
<b>Teaching Hours/Week (L:T:P:O)</b>			3:0:0:0	<b>Total Hours:</b>	40
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	3
<b>I. Course Objectives:</b>					
<ol style="list-style-type: none"> <li>To prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.</li> <li>To equip students with a basic foundation in electronic engineering required for comprehending the operation and application of electronic circuits, logic design, embedded systems, and communication systems.</li> <li>Professionalism &amp; Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.</li> </ol>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
<ul style="list-style-type: none"> <li>Chalk and talk method</li> <li>Power point presentation / Keynotes</li> <li>Videos</li> <li>Virtual Labs</li> </ul>					
<b>III. COURSE CONTENT</b>					
<b>III(a). Theory PART</b>					
<b>Module-1: Semiconductor Diodes and Applications</b>					<b>8 hours</b>
P-N junction diode, Characteristics and Parameters, Zener Diode, Half wave Rectification, Full wave Rectification, Half Wave rectifier power supply (Capacitor Filter Circuit), Zener diode voltage regulators. Text 1					
<b>RBT Levels:</b> L1, L2					
<b>Module-2: BJT, Feedback Amplifiers and Oscillators</b>					<b>8 hours</b>
BJT operation, Common Base Characteristics, Common Emitter Characteristics, Common Collector Characteristics, Series Voltage Negative Feedback (Negative feedback concept, Voltage Gain), Phase Shift Oscillator (OPAMP Phase Shift Oscillator), Wein Bridge oscillator. Text 1					

<b>RBT Levels: L1, L2</b>															
<b>Module-3:Digital Electronics Fundamentals</b>													<b>8 hours</b>		
Analog versus digital, Introduction to number system, Decimal Number system, Binary Number system, Octal Number system, Hexadecimal Number system, Decimal to Binary Conversion, Decimal to Octal Conversion, Decimal to hexadecimal Conversion, Binary to Octal and Octal to Binary Conversion, Hex-Binary and Binary to Hex Conversion, Hex- Octal and Octal to Hex Conversion, Logic Gates, Universal Gates, Introduction to Boolean algebra, Postulates of Boolean Algebra, Theorems of Boolean Algebra, Arithmetic Circuits (Half adder, Full Adder). Text 2															
<b>RBT Levels: L1, L2</b>															
<b>Module-4:Operational Amplifiers and Applications</b>													<b>8 hours</b>		
Integrated circuit Operational Amplifier, Voltage Follower Circuit, Non-Inverting, Inverting (Direct Coupled only), Summing, Difference Amplifier. Text 1															
<b>RBT Levels: L1, L2, L3</b>															
<b>Module-5:Basics of Instrumentations &amp; Measurements</b>													<b>8 hours</b>		
What is measurement, Classification of Methods of measurements, Fundamental methods of measurements, Input-Output Configurations of Instruments, Static & Dynamic Characteristics, Mass Sensing Element, Thermal Detector, Sensors of Motion, Piezoelectric Principle, Strain Gauges (Mechanical, optical, Electrical). Text 3															
<b>RBT Levels: L1, L2</b>															
<b>IV. COURSE OUTCOMES</b>															
CO1	Explain the basic construction, operation, characteristics and applications of semiconductor devices.														
CO2	Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices like BJT, Feedback amplifiers & Oscillators.														
CO3	Develop digital circuits by using logic gates and its functions.														
CO4	Analyse working of OPAMP in various circuits.														
CO5	Describe the Instrumentations & Measuring Devices.														
<b>V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>															
<b>PO/PSO</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	3	2											2		
<b>CO2</b>	3	2											2		
<b>CO3</b>	3	2											2		
<b>CO4</b>	3	2											2		
<b>CO5</b>	3	2											2		
<b>VI. Assessment Details (CIE &amp; SEE)</b>															
<b>General Rules:</b> Refer Appendix Section 1															
<b>Continuous Internal Evaluation (CIE):</b> Refer Appendix Section 1															
<b>Semester End Examination (SEE):</b> 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
01	Electronic Devices and Circuits	David A Bell	5 <sup>th</sup> Edition	Oxford
02	Digital Electronics Principles and Integrated Circuits	Anil. K Maini	2020 ISBN: 978-81-265-0863-1	Wiley
03	Mechanical & Industrial Instruments	Er. R K Jain	3 <sup>rd</sup> Edition, 2015	K Publishers

### VII(b): Reference Books:

01	Electronic Devices and Circuit Theory	Robert L Boylestad	9 <sup>th</sup> Edition	Prentice Hall of India
02	Electronic Circuits Fundamentals & Applications	Mike Tooley	4th Edition, 2015	Elsevier
03	Basic Electronics	D.P.Kothari, I.J.Nagarath	1st Edition 2014	McGraw Hill

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

- [https://onlinecourses.swayam2.ac.in/nou23\\_ec05](https://onlinecourses.swayam2.ac.in/nou23_ec05)
- [https://onlinecourses.swayam2.ac.in/nou23\\_ec06](https://onlinecourses.swayam2.ac.in/nou23_ec06)
- [https://onlinecourses.swayam2.ac.in/cec23\\_cs11](https://onlinecourses.swayam2.ac.in/cec23_cs11)





|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	ESC		
<b>Course Title:</b> Mechanical Engineering Science					
<b>Course Code:</b>	23MET14C/24C		<b>Credits:</b>	3	
<b>Teaching Hours/Week (L:T:P:O)</b>			3:0:0:0	<b>Total Hours:</b>	40
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	3
<b>I .Course Objectives:</b>					
This course will enable students:					
<ol style="list-style-type: none"> <li>1. Acquire basic knowledge of mechanical engineering and fundamentals of non-conventional energy sources.</li> <li>2. Attain knowledge about traditional and advanced manufacturing processes.</li> <li>3. Procure basic concepts of IC engines, and Electric vehicles.</li> <li>4. Obtain the knowledge of mechatronics and robotics.</li> <li>5. Gain the fundamental concepts of composite materials and joining processes.</li> </ol>					
<b>II. p.Teaching-Learning Process (General Instructions):</b>					
<ul style="list-style-type: none"> <li>• Adopt different types of teaching methods to develop the outcomes through Power point presentations and Video demonstrations.</li> <li>• Arrange visits to show the working models &amp; processes.</li> <li>• Adopt collaborative (Group Learning) Learning in the class.</li> <li>• Adopt Problem Based Learning (PBL), which foster students' Analytical skills and develops thinking skills such as evaluating, generalizing, and analysing information.</li> </ul>					
<b>III.COURSE CONTENT</b>					
<b>Module-1:</b>				8 Hours	
<b>Introduction to Mechanical Engineering:</b> Role of Mechanical Engineering in Industries and Society- Emerging Trends and Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors.					
<b>Energy Sources and Power Plants:</b> Basic working principles of Hydel power plant, Thermal power plant, nuclear power plant, Solar power plant, Tidal power plant and Wind power plant.					
<b>Pre-requisites (Self Learning):</b> Basic knowledge of power generation					
<b>RBT Levels: L1, L2</b>					
<b>Module-2:</b>				8 Hours	
<b>Machine Tool Operations: Lathe:</b> Principle of working of a centre lathe, lathe operations:Turning, facing, knurling, thread cutting and taper turning by swivelling the compound rest.					
<b>Drilling Machine:</b> Working of simple drilling machine, drilling operations: drilling, boring,reaming, tapping, counter sinking and counter boring.					
<b>Milling Machine:</b> Principle, Working and types of milling machine, milling operations: planemilling, end milling and slot milling.					
<b>(No sketches of machine tools, sketches to be used only for explaining the operations).</b>					
<b>Introduction to Advanced Manufacturing Systems:</b> Introduction, components of NC, CNC,advantages and applications of CNC.					
<b>Pre-requisites (Self Learning):</b> Basics knowledge of machine tools					

<b>RBT Levels: L1, L2</b>																
<b>Module-3:</b>															8 Hours	
<b>Introduction to IC Engines:</b> Components and working principles of 2 & 4-Stroke Petrol engine and 4-Stroke Diesel engines, performance of IC engines (Simple numericals). <b>Insight into future mobility technology;</b> Introduction to Electric and Hybrid Vehicles, Working Principle, Advantages and disadvantages of Electric Vehicles (EVs) and Hybrid vehicles. Emission standards.																
<b>Pre-requisites (Self Learning):</b> Basic knowledge of automobiles																
<b>RBT Levels: L1, L2, L3</b>																
<b>Module-4:</b>															8 Hours	
<b>Mechanical Power Transmission: Belt Drives:</b> Introduction, Types of belt drives (Open and Cross Belt Drive), length of the belt and tensions. <b>Gear Drives:</b> Types - spur, helical, bevel, worm and rack and pinion, velocity ratio, simple and compound gear trains <b>Introduction to Robotics:</b> Open-loop and closed-loop control systems. Joints & links, Robot anatomy, Applications of Robots in material handling, processing, assembly and inspection.																
<b>Pre-requisites (Self Learning):</b> Basic knowledge of power transmissions & control system																
<b>RBT Levels: L1, L2</b>																
<b>Module-5:</b>															8 Hours	
<b>Introduction to Advanced Engineering Materials: Composites:</b> Fibre reinforced composites, metal matrix composites, <b>Smart materials-</b> peizo electric materials, Shape memory alloys, Semiconductors and super - insulators <b>Joining Processes:</b> Soldering, Brazing and Welding, Definitions, classification of welding process, Arc welding, Gas welding, (types of flames), TIG welding, MIG welding.																
<b>Pre-requisites (Self Learning):</b> Basic knowledge of materials and welding																
<b>RBT Levels: L1, L2</b>																
<b>IV.COURSE OUTCOMES</b>																
<b>CO1</b>	Understand the basic concepts of mechanical engineering in the field of energy & its utilization															
<b>CO2</b>	Determining conventional and advanced machining processes in manufacturing of components.															
<b>CO3</b>	Interpret the fundamental concepts of engines & future mobility technology.															
<b>CO4</b>	Apply the basic concept of transmission system, mechatronics and robotics application															
<b>CO5</b>	Enumerate the application of engineering materials & joining process in manufacturing.															
<b>V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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															
<b>VI.Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer Annexure Section 1																
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure Section 1																
<b>Semester End Examination (SEE):</b> Refer Annexure Section 1																
<b>VII.Learning Resources</b>																
<b>VII(a): Textbooks:</b>																
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	Media Promoters and Publishers Pvt.
<b>VII(b): Reference Books:</b>				
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	4 <sup>th</sup> edition, 2018	Pearson
<b>VII(c): Web links and Video Lectures (e-Resources):</b>				
<ul style="list-style-type: none"> <li>• <a href="https://youtu.be/cT9UN1XENnk?si=EtVUDGO8cHU5xWfY">https://youtu.be/cT9UN1XENnk?si=EtVUDGO8cHU5xWfY</a></li> <li>• <a href="https://youtu.be/fw8Jfoif1BM?si=IbGrPZSPpcyW2BZq">https://youtu.be/fw8Jfoif1BM?si=IbGrPZSPpcyW2BZq</a></li> <li>• <a href="https://www.youtube.com/watch?v=mNOYS-duUJYEV">https://www.youtube.com/watch?v=mNOYS-duUJYEV</a> Electrical Systems BASICS!</li> <li>• <a href="https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing- and- process-industry/">https://rakhoh.com/en/applications-and-advantages-of-steam-in-manufacturing- and- process-industry/</a></li> <li>• <a href="#">Videos   Makino</a> (For Machine Tool Operation)</li> </ul>				
<b>VIII: Activity Based Learning / Practical Based Learning/Experiential learning:</b>				
<ol style="list-style-type: none"> <li>1. Visit to any manufacturing/aero/auto industry or any power plant</li> <li>2. Demonstration of lathe/milling/drilling/CNC operations</li> <li>3. Demonstration of working of IC engine</li> <li>4. Demonstration of metal joining process</li> <li>5. Video demonstration of latest trends in mobility/robotics</li> </ol>				





|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	ESC	
<b>Course Title:</b> Engineering Mechanics				
<b>Course Code:</b>	23CVT14C/24C		<b>Credits:</b>	03
<b>Teaching Hours/Week (L:T:P:O)</b>		3:0:0:0	<b>Total Hours:</b>	40
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b> 100
<b>SEE Type:</b>	Theory		<b>Exam Hours:</b>	03
<b>I. Course Objectives:</b>				
<ul style="list-style-type: none"> <li>To make students learn the scope of various fields of civil engineering.</li> <li>To develop student's ability to analyze the problems involving forces, moments with their applications.</li> <li>To develop the student's ability to find out the center of gravity and moment of inertia and their applications.</li> </ul>				
<b>II. Teaching-Learning Process (General Instructions):</b>				
Chalk and talk, videos, Power Point presentation, animations.				
<b>COURSE CONTENT</b>				
<b>Module-1: Introduction to Civil Engineering</b>				8 Hours
<b>INTRODUCTION TO CIVIL ENGINEERING</b> 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.				
<b>INTRODUCTION TO ENGINEERING MECHANICS</b> Introduction, Concepts of Particle, Rigid and Deformable Bodies. Concept of idealization. Force and its characteristics, System of forces, Fundamental laws of Mechanics. <b>Textbook:</b> H. J Sawant: <b>Chapter-1: sections-1</b> <b>Self-Learning:</b> Smart materials used in construction. <b>RBT Levels:</b> L1 L2				
<b>Module-2: Force Systems</b>				8 Hours
<b>ANALYSIS OF FORCE SYSTEMS:</b> Resolution, and composition 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. <b>Textbook:</b> H. J Sawant: <b>Chapter 3 &amp; 4: Sections 3 &amp; 4</b> <b>Self-Learning:</b> Free body diagram for complex figures(3D) <b>RBT Levels:</b> L1 L2 L3				
<b>Module-3: Equilibrium of Bodies</b>				8 Hours
<b>ANALYSIS OF BODIES IN EQUILIBRIUM</b> Free body diagrams, Lami's theorem, Equations of Equilibrium, Equilibrium of coplanar concurrent and non-concurrent force systems – Numerical problems. <b>ANALYSIS OF BEAMS:</b> 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). <b>Textbook:</b> H. J Sawant: <b>Chapter 6&amp;8: Sections 6 &amp; 8</b> <b>Self-Learning:</b> Finding support reactions for a complex loaded beam. <b>RBT Levels:</b> L1 L2 L3																
<b>Module-4: Friction and Trusses</b>														8 Hours		
<b>FRICITION:</b> Introduction, Frictional force, Types of Friction- Static friction and Dynamic friction, Limiting friction, ladder friction, Laws of Friction-Laws of Static friction and Laws of Dynamic friction, Angle of friction, Angle of Repose and Cone of friction. Problems on Static Friction- Horizontal plane, Inclined plane, Interconnected bodies and ladder friction. <b>ANALYSIS OF TRUSSES</b> Introduction, Types of trusses, Assumptions in analysis of trusses. Analysis of plane perfect trusses by method of joints and method of sections. Numericals. <b>Textbook:</b> H. J Sawant: <b>Chapter 7&amp;12: Sections 7 &amp; 12</b> <b>Self-Learning:</b> Pulley problems with friction <b>RBT Levels:</b> L1 L2 L3																
<b>Module-5: Centroid and Moment of Inertia</b>														8 Hours		
<b>CENTROID:</b> Introduction, methods of determining the centroid, locating the centroid of simple figures from first principle, Centroid of composite and built-up sections – Numerical problems. <b>MOMENT OF INERTIA:</b> 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. Concept of product of inertia (No problem). <b>Textbook:</b> H. J Sawant: <b>Chapter 10 &amp; 11: Sections 10 &amp; 11</b> <b>Self-Learning:</b> Centroid & MOI for complex figures <b>RBT Levels:</b> L1 L2 L3																
<b>IV. COURSE OUTCOMES</b>																
<b>CO1</b>	Summarize the various fields of civil engineering and importance of building materials.															
<b>CO2</b>	Apply the knowledge of science to study the effect of force systems on the rigid bodies.															
<b>CO3</b>	Analyse the action of force systems on the rigid bodies.															
<b>CO4</b>	Determine the centroid and moment of inertia of regular and built-up sections.															
<b>V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
PO/PSO	1	2	3	4	5	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			
<b>VI. Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer Appendix Section 1																
<b>Continuous Internal Evaluation (CIE):</b> Refer Appendix Section 1																
<b>Semester End Examination (SEE):</b> Refer Appendix Section 1																
<b>VII. Learning Resources</b>																
<b>VII(a): Textbooks:</b>																
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>					<b>Edition and Year</b>					<b>Name of the publisher</b>				
<b>1</b>	Basic Civil Engineering and Engineering	Bansal R. K.					2015					Laxmi Publications				

	Mechanics			
2	Elements of Civil Engineering and Engineering Mechanics	Kolhapure B K	2014	EBPB
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

**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=atoP5_DeTPE)  
<https://www.youtube.com/watch?v=ksmsp9OzAsI>  
<https://www.youtube.com/watch?v=x1ef048b3CE>  
[https://www.youtube.com/watch?v=1\\_Nck-X49qc](https://www.youtube.com/watch?v=1_Nck-X49qc)  
[https://play.google.com/store/apps/details?id=appinventor.ai\\_jgarc322.Resultant\\_Force](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=0RZHHgL8m_A)  
<https://www.youtube.com/watch?v=Bl55KnQOWkY>  
<https://www.youtube.com/watch?v=nFBvLIffqI>

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

[https://www.youtube.com/watch?v=Zrc\\_gB1YYS0](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://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>





|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	IESC		
<b>Course Title:</b> Principles of C Programming					
<b>Course Code:</b>	23CPI15C/25C		<b>Credits:</b>	4	
<b>Teaching Hours/Week (L:T:P:O)</b>			3:0:2:0	<b>Total Hours:</b>	40 + Lab slots
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	3
<b>I. Course Objectives:</b>					
This course will enable students to:					
<ol style="list-style-type: none"> <li>1. Familiarize with writing of algorithms, flowchart and fundamentals of C.</li> <li>2. Use of different Branching statements and loops</li> <li>3. Use and implement data structures like arrays and structures.</li> <li>4. Implement different programs using functions.</li> <li>5. Define and use of pointers with simple applications.</li> </ol>					
<b>II. Teaching-Learning Process (General Instructions):</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 student's 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 student's 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>III. COURSE CONTENT</b>					
<b>III(a). Theory PART</b>					
<b>Module-1: Introduction.</b>				8 Hours	
Definition, Characteristics of Computers, Stored Program Concept, History of Computers, Classification of Computers, Application of Computers, Basic Organization of Computers, Computer Hardware and Software, Storage device concepts, Operating Systems, and Networking. <b>Textbook1: Chapter1, Textbook2: 1.9, 1.10, 1.11, chapter2.</b>					
<b>RBT Levels: 1</b>					
<b>Module-2: Basics of C.</b>				8 Hours	

<b>C-tokens and Data types:</b> Introduction, Character set, C Tokens, Declaration of variables, Storage class, Assigning values to variables, Symbolic constants.																
<b>Managing I/O operations and operators:</b> Managing I/O operations, Operators and Expressions.																
<b>Textbook 2: Chapter 4: 4.1-4.7, Chapter 5, Chapter 6.</b>																
<b>RBT Levels: 2</b>																
<b>Module-3: Control Statement and loops.</b>														8 Hours		
<b>Control statements:</b> Conditional and Un conditional branching statements with programming examples. Looping statements, break and continue statements.																
<b>Textbook 2: Chapter 8, Chapter 9.</b>																
<b>RBT Levels:2,3,4</b>																
<b>Module-4: Arrays and Strings.</b>														8 Hours		
<b>Arrays:</b> One-Dimensional Array, Two-Dimensional Arrays (Declaration and Compile Time and Run Time Initialization), reading and displaying arrays, Searching and Sorting.																
<b>Strings:</b> Introduction, Character Arrays, Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen. Various String Handling Functions with programming examples.																
<b>Textbook 2: Chapter 10 and 11.</b>																
<b>RBT Levels:2,3,4</b>																
<b>Module-5: User Defined Functions.</b>														8 Hours		
<b>User Defined Functions:</b>																
Need for Functions, Types of functions, function definition, declaration and its scope, Category offunctions Storage classes (Automatic, Static, Extern, and Register).																
<b>Recursion:</b> Introduction recursion, types in recursive function, programming examples on recursivefunctions.																
<b>Textbook 2: Chapter 7.</b>																
<b>RBT Levels:2,3,4</b>																
<b>III(b). PRACTICAL PART</b>																
<b>Sl. No.</b>		<b>Experiments / Programs / Problems</b>														
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		C Program to find Mechanical Energy of a particle using $E = mgh + \frac{1}{2} mv^2$ .														
4		Compute the roots of a quadratic equation by accepting the coefficients. Print appropriate messages.														
5		C Program to Check the Given Character is Lowercase or Uppercase or Special Character.														
6		Simulation of a Simple Calculator.														
7		Write a program to print the position of the smallest number of n numbers using arrays.														
8		Sort the given set of N numbers using Bubble sort.														
9		Implement Matrix multiplication and validate the rules of multiplication.														
10		Compute $\sin(x)/\cos(x)$ using Taylor series approximation. Compare results with the built in library function.														
11		Program to balance the given Chemical Equation values x, y, p, q of a simple chemical equation of the type: The task is to find the values of constants b1, b2, b3 such that the equation is balanced on both sides and it must be the reduced form.														
12		Write functions to implement string operations such as compare, concatenate, String length. Convince the parameter passing techniques.														
<b>IV. COURSE OUTCOMES</b>																
<b>CO1</b>		Illustrate the basic constructs of C language.														
<b>CO2</b>		Understand and apply suitable syntax for various problems.														
<b>CO3</b>		Construct programming solutions for various basic problems.														
<b>CO4</b>		Implement programs using problem solving skills.														
<b>V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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	3 <sup>rd</sup> Edition, 2023	Oxford University Press, New Delhi
2	Programming in ANSI C	E. Balaguruswamy	7 <sup>th</sup> 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](http://elearning.vtu.ac.in/econtent/courses/video/BS/15PCD23.html)
- [2. https://nptel.ac.in/courses/106/105/106105171/](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](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



|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	IESC		
<b>Course Title:</b> Computer Aided Drawing for Engineers					
<b>Course Code:</b>	23CDI15C/25C		<b>Credits:</b>	4	
<b>Teaching Hours/Week (L:T:P:O)</b>			3:0:2:0	<b>Total Hours:</b>	40 + Lab slots
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	3
<b>I. Course Objectives:</b>					
This course will enable students to:					
<ul style="list-style-type: none"> <li>• Attain the basic principles and conventions of engineering drawing</li> <li>• Understand the use of drawing as a communication mode</li> <li>• Visualize 2D and 3D pictorial views using CAD software</li> <li>• Enumerate the concepts of development of lateral surfaces</li> <li>• Acquire multi-disciplinary concept of applications</li> </ul>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
<ul style="list-style-type: none"> <li>• Adopt different types of teaching methods to develop the outcomes through Power point presentations and Video demonstrations.</li> <li>• Adopt teaching methods by using working models</li> <li>• Adopt collaborative (Group Learning) Learning in the class.</li> <li>• 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.</li> </ul>					
<b>III. COURSE CONTENT</b>					
<b>Module-1:</b>					8 Hours
<b>Introduction:</b>					
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					
<b>Orthographic Projections of Points, Lines and Planes:</b>					
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).					
<b>Pre-requisites (Self Learning):</b> Basics of Geometry					
<b>RBT Levels: L1, L2, L3</b>					
<b>Module-2:</b>					8 Hours
<b>Orthographic Projection of Solids:</b>					
Orthographic projection of right regular solids (Solids Resting on HP only); Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones & Cubes.					
<b>Pre-requisites (Self Learning):</b> Basics of Geometry					
<b>RBT Levels: L1, L2, L3</b>					
<b>Module-3:</b>					8 Hours



<b>Isometric Projections:</b> 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.																
<b>Pre-requisites (Self Learning):</b> Basics of Geometry and 3D Drawing																
<b>RBT Levels: L1, L2, L3</b>																
<b>Module-4:</b>														8 Hours		
<b>Development of Lateral Surfaces of Solids:</b> Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones resting with base on HP only. Development of their frustums and truncations.																
<b>Pre-requisites (Self Learning):</b> Basics of Geometry																
<b>RBT Levels: L1, L2, L3</b>																
<b>Module-5: Multidisciplinary Applications &amp; Practice:</b>														8 Hours		
<b>Basic Building Drawing:</b> Architectural floor plan, basic foundation drawing, steel structures- Frames, bridges, trusses using suitable software.																
<b>Pre-requisites (Self Learning):</b> Basics of Drawing																
<b>RBT Levels: L1, L2, L3</b>																
<b>IV. COURSE OUTCOMES</b>																
<b>CO1</b>	Understand and visualize the objects with definite shape and dimensions															
<b>CO2</b>	Analyse the shape and size of objects through different views															
<b>CO3</b>	Create a 3D view using CAD software.															
<b>CO4</b>	Develop the lateral surfaces of the object															
<b>CO5</b>	Identify the interdisciplinary engineering components and systems through its graphical representation.															
<b>V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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				
<b>VI. Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer appendix section 3																
<b>Continuous Internal Evaluation (CIE):</b> Refer appendix section 3																
<b>Semester End Examination (SEE):</b> Refer appendix section 3																
<b>VII. Learning Resources</b>																
<b>VII(a): Textbooks:</b>																
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>					<b>Edition and Year</b>					<b>Name of the publisher</b>				
1	Engineering Drawing: Plane and 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				

<b>VII(b): Reference books:</b>				
1	Engineering Drawing,	Parthasarathy N. S., Vela Murali,	2015	Oxford University Press,.
2	Fundamentals of Engineering Drawing,	<i>Luzadder Warren J.,,</i>	2005	Prentice-Hall of India Pvt. Ltd., New Delhi, Eastern Economy Edition, 2005
3	Design of steel structures	K S Sai Ram		Pearson
4	Design of foundation systems	Nainan p kurian		Narosa publications
<b>VII(c): Web links and Video Lectures (e-Resources):</b>				
<b>NPTEL Videos:</b>				
<a href="https://youtube.com/playlist?list=PLp6ek2hDcoNCjoRLQ4rjpCozisCACBxKA">https://youtube.com/playlist?list=PLp6ek2hDcoNCjoRLQ4rjpCozisCACBxKA</a>				
<b>VIII: Activity Based Learning / Practical Based Learning/Experiential learning:</b>				
Activities like Model Preparation & Presentation, self-study activities.				



|| 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)

<b>Semester:</b>	I/II	<b>Course Type:</b>	IBSC		
<b>Course Title:</b> Physics of Material Designing					
<b>Course Code:</b>	23PHI12C/22C		<b>Credits:</b>	4	
<b>Teaching Hours/Week (L:T:P:O)</b>		2:2:2:0	<b>Total Hours:</b>	40+ Lab Slots	
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	3
<b>I. Course Objectives:</b>					
<ul style="list-style-type: none"> <li>• To understand the types of oscillation, shock waves &amp; their applications.</li> <li>• To study the elastic properties of materials and basic concepts of nano materials</li> <li>• To understand the essentials of photonics and their application relevant to civil engineering.</li> <li>• To study the acoustics of buildings and the essentials of radiometry and photometry.</li> <li>• To understand the operations of different instruments and to analyze experimental results.</li> </ul>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
Some of the adapted methods in teaching learning methods are					
<ol style="list-style-type: none"> <li>1. Chalk and Talk</li> <li>2. Blended Mode of Learning</li> <li>3. Simulations, Interactive Simulations and Animations</li> <li>4. Smart Classroom</li> <li>5. Lab Experiment Videos</li> </ol>					
<b>III. COURSE CONTENT</b>					
<b>III(a).Theory Part</b>					
<b>Module-1: Oscillations and Waves</b>				8 Hours	
<b>Oscillations:</b> Basics of SHM, derivation of equation for SHM, Mechanical simple harmonic oscillators (spring constant by series and parallel combination), Equation of motion for free oscillations, Natural frequency of oscillations.					
<b>Damped Oscillations:</b> Theory of damped oscillations (derivation), over damping, critical & under damping (graphical representation).					
<b>Forced Oscillations:</b> Theory of forced oscillations (derivation) and resonance, sharpness of resonance.					
<b>Shock waves:</b> Introduction to shock waves, Mach number, Properties of Shock waves, Construction and working of Reddy shock tube, applications of shock waves, Numerical problems.					
<b>Engineering Physics by S P Basavaraju: Chapter:1- Oscillations and waves</b>					
<b>Waves and oscillations by R N Chaudhri: Chapter: 3-Damped harmonic oscillations</b>					
<b>Chapter:4-Forced Vibrations and resonance</b>					
<b>Pre-requisites (Self Learning)</b> Basics of Oscillations					
<b>RBT Levels:</b> L1 – Remembering, L2 – Understanding, L3 – Applying.					
<b>Module-2: Elastic Properties of materials</b>				8 Hours	
<b>Elasticity:</b> Concept of elasticity, plasticity, stress, strain, tensile stress, shear stress, compressive stress, Stress –strain Graph, Hooke’s law, different elastic moduli: Poisson’s ratio, Expression for Young’s modulus (Y), Bulk modulus (K) and Rigidity modulus ( $\eta$ ) in terms of $\alpha$ and $\beta$ . Relation between Y, $\eta$ and K, Limits of Poisson’s ratio.					
<b>Bending of beams:</b> Neutral surface and neutral plane, Derivation of expression for bending moment of a beam with circular and rectangular cross section. Single cantilever, derivation of expression for young’s modulus. Numerical problems					
<b>Engineering Physics by S P Basavaraju: Chapter-2: Elastic properties of Materials Engineering Physics by R K Gupta and R K Gaur: Chapter: 7- Elasticity</b>					
<b>Pre-requisites (Self Learning):</b> Elastic Moduli and its Types					

<b>RBT Levels::</b> L1 – Remembering, L2 – Understanding, L3 – Applying,	
<b>Module-3:Lasers &amp; Optical Fibers</b>	8 Hours
<p><b>Lasers:</b> 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, working of semiconductor Lasers. Application of Lasers: Road Profiling and total station</p> <p><b>Optical Fibers:</b> 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 optical fiber, Optical fiber sensors- displacement sensor, Numerical problems.</p> <p><b>Modern Engineering Physics S.L. Guptha and Sanjeev Guptha: 4- Lasers and Holography and Chapter: 5- Fiber Optics</b></p> <p><b>Applied Physics for engineers by P K Diwan: Chapter:4- Lasers Chapter: 5 – Optical fiber</b></p>	
<b>Pre-requisites (Self Learning):</b> Basic concepts of sensors	
<b>RBT Levels::</b> L1 – Remembering, L2 – Understanding, L3 – Applying,	
<b>Module-4:Acoustics, Radiometry and Photometry</b>	8 Hours
<p><b>Acoustics:</b> Introduction to Acoustics, Types of Acoustics, Reverberation and reverberation time, Absorption power and Absorption coefficient, Requisites for acoustics in auditorium, Sabine’s formula (derivation), Measurement of absorption coefficient, Factors affecting the acoustics and remedial measures, Sound Insulation and its measurements. Noise and its Measurements.</p> <p><b>Radiometry and Photometry:</b> Radiation Quantities, Spectral Quantities, Relation between luminance and Radiant quantities, Reflectance and Transmittance, Photometry (cosine law and inverse square law).</p> <p><b>Modern Engineering Physics by S.L. Guptha and Sanjeev Guptha: Chapter 7-Acoustics of Building and acoustics quieting</b></p> <p><b>Engineering Physics by S L Guptha and R K Gaur: Chapter: 41-Acoustics of Building</b></p>	
<b>Pre-requisites (Self Learning):</b> Basics of Sound, Waves & light properties	
<b>RBT Levels::</b> L1 – Remembering, L2 – Understanding, L3 – Applying.	
<b>Module-5:Modern Engineering Materials</b>	8 Hours
<p><b>Nano Materials:</b> Introduction to Nano materials, Surface to volume ratio, Quantum confinement – Quantum well, Quantum wire, Quantum dot. Carbon Nano tubes, types, properties, Synthesis of carbon nano tubes - Arc discharge method, Applications. Transmission Electron Microscopy (TEM), Scanning Electron Microscope (SEM), Numerical problems.</p> <p><b>Composite Materials:</b> Introduction to composite materials, Classification of composites based on reinforcement materials and matrix. Advantages and disadvantages of composite materials, Engineering Applications</p> <p><b>Engineering physics by G. Aruldas: Chapter 16: Nano technology</b></p> <p><b>Nanotechnology Fundamentals and Applications By Manasi Karkare: Chapter:3-Nanomaterials Chapter:8-Nanocomposite</b></p>	
<b>Pre-requisites (Self Learning):</b> Principle and working of Optical Microscope,	
<b>RBT Levels:</b> L1 – Remembering, L2 – Understanding, L3 – Applying.	
<b>III(b). Practical part</b>	
<b>Sl. No.</b>	<b>Experiments</b>
1	Determination of Young’s Modulus of a material by Uniform Bending
2	Determination of n by Tensional Pendulum
3	Study of frequency response of Series and Parallel LCR Circuits
4	Determination of Fermi Energy of a conductor
5	Determination of resistivity of a material using Four Probe Method
6	Determination of stiffness factor of a given springs
7	Determination of Young’s Modulus of a material by Single Cantilever
8	Particle size determination using LASER source
9	Measurement of Wavelength of LASER using Diffraction Grating
10	Determination of Numerical Aperture using optical fiber
11	Measurement of Magnetic Field at any point along the axis of a circular coil
12	PHET Interactive Simulations
13	Verification of Stefan’s law
14	Measurement of dielectric constant by Charging and Discharging method of a Capacitor



<b>Instructions for conduction of practical part:</b>																
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.																
<ul style="list-style-type: none"> <li>Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 50 marks.</li> <li>Average marks scored by the students from all the experiments are considered.</li> <li>Weightage to be given for neatness and submission of record/write-up on time.</li> <li>Department shall conduct 01 test for 50 marks, test shall be conducted after the completion of prescribed experiments.</li> <li>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.</li> </ul>																
<b>IV. COURSE OUTCOMES</b>																
<b>CO1</b>	<b>Elucidate</b> the concepts in oscillations, waves and elasticity															
<b>CO2</b>	<b>Discuss</b> the principles of photonic devices and their application relevant to civil engineering.															
<b>CO3</b>	<b>Summarize</b> concepts of acoustics in buildings and explain the concepts in radiation and photometry.															
<b>CO4</b>	<b>Explain</b> basic concepts of nano science and technology.															
<b>CO5</b>	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.															
<b>V.CO-PO-PSO MAPPING</b> (mark H=3; M=2; L=1)																
<b>VI.</b>																
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				
CO3	3	2										2				
CO4	3	2	1		1							2				
CO5	3	2	1		2			3	3			2				
<b>VII.Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer Appendix section 2																
<b>Continuous Internal Evaluation (CIE):</b> Refer Appendix section 2																
<b>semester End Examination (SEE):</b> Refer Appendix section 2																
<b>VIII.Learning Resources</b>																
<b>VII(a): Textbooks:</b>																
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>	<b>Year and Edition</b>	<b>Name of the publisher</b>												
1	A Textbook of Engineering Physics	M.N. Avadhanulu and P.G. Kshirsagar	10 <sup>th</sup> revised Ed,	S. Chand. & Company Ltd, New Delhi												
2	An Introduction to Lasers theory and applications by	M.N.Avadhanulu and P.S.Hemne	2012. - Revised Edition	S.Chand and Company Ltd -New Delhi.												
3	Engineering Physics-	Gaur and Gupta	2017	Dhanpat Rai Publications												
4	Concepts of Modern Physics	Arthur Beiser	2006-6 <sup>th</sup> Edition	Tata McGraw Hill Edu Pvt Ltd- New Delhi												
5	Engineering Physics	S.P Basavraju	2018-CBCS Edition	Subhas Stores, Bangalore												
6	Solid State Physics	S O Pillai	8 <sup>th</sup> Ed; 2018	New Age International Publishers												
<b>VII(b): Reference Books:</b>																
1	Nano Composite Materials-	J. arameswaranpillai, N.Hameed, T.Kurian, Y. Yu	2017, 1st Edition	CRC Press.												

	Synthesis, Properties and Applications			
2	Lasers and Non Linear Optics	B.B. Laud	3 <sup>rd</sup> Ed, 2011	New Age International Publishers
3	Solid State Physics	S O Pillai	8 <sup>th</sup> Ed, 2018	New Age International Publishers
4	Materials Characterization Techniques	Sam Zhang, Lin Li, Ashok Kumar	1 <sup>st</sup> Ed, 2008	CRC Press,
5	Nanoscience and Nanotechnology: Fundamentals to Frontiers	M.S.Ramachandra Rao & Shubra Singh	2013, 1st Edition	Wiley India Pvt Ltd
6	Nanotechnology Fundamentals and applications	Mansi Karkare	2008	I.K International
7	Waves and oscillations	R N Chaudhri	2 <sup>nd</sup> Edition	New Age international
8	Applied Physics for engineers	P K Diwan	2014	Wiley Publications
9	Engineering Physics	R K Guptha and R K Gaur	8 <sup>th</sup> Revised-2001	Dhanpat Rai Publications

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

<https://www.britannica.com/technology/laser.k>  
<https://nptel.ac.in/courses/115/102/115102124/>  
<https://nptel.ac.in/courses/115/104/115104096/>  
<http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>  
[https://onlinecourses.nptel.ac.in/noc20\\_mm14/preview](https://onlinecourses.nptel.ac.in/noc20_mm14/preview)

Mention the links of the online resources, video materials, etc.

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

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



|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	IBSC	
<b>Course Title:</b> Engineering materials and Environmental Chemistry				
<b>Course Code:</b>	23CHI12C/22C		<b>Credits:</b>	4
<b>Teaching Hours/Week (L:T:P:O)</b>			2:2:2:0	<b>Total Hours:</b> 40+ Lab slots
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b> 100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b> 3
<b>I. Course Objectives:</b>				
<ul style="list-style-type: none"> <li>To enable students to acquire knowledge on principles of chemistry for engineering applications.</li> <li>To develop an intuitive understanding of chemistry by emphasizing the related branches of engineering.</li> <li>To provide students with a solid foundation in analytical reasoning required to solve societal problems.</li> </ul>				
<b>II. Teaching-Learning Process (General Instructions):</b>				
<p>These are sample strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching–Learning more effective</p> <ul style="list-style-type: none"> <li>Tutorial &amp; remedial classes for needy students</li> <li>Conducting Makeup classes/Bridge courses for needy students</li> <li>Demonstration of concepts either by building models or by industry visit</li> <li>Experiments in laboratories shall be executed in blended mode (conventional or non-Conventional methods)</li> <li>Use of ICT–Online videos, online courses</li> <li>Use of online platforms for assignments/Notes/Quizzes (Ex. Google classroom)</li> </ul>				
<b>III. COURSE CONTENT</b>				
<b>III(a). THEORY PART</b>				
<b>Module-1: Green Chemistry</b>				<b>8 Hours</b>
<p><b>Green Chemistry:</b> Basic principles of green chemistry -brief discussion on 12 principles of green chemistry. Various green chemical approaches – Microwave synthesis, Bio catalysed reaction (only explanation with examples), Synthesis of typical organic compounds by conventional and green route; Adipic acid – Conventional synthesis from Benzene, Green synthesis from glucose.</p> <p><b>Green fuel:</b> 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<sub>2</sub>SO<sub>4</sub> as electrolyte). Construction and working of solar photovoltaic cell, advantages, and disadvantages.</p> <p><b>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</b></p>				
<b>Pre-requisites (Self Learning)</b>				
Atom economy, Zone refining, Physical and Chemical properties of Si, doping of Si				
<b>RBT Levels: L1,L2,L3</b>				
<b>Module-2: Corrosion Science and Waste Management</b>				<b>8 Hours</b>

<p><b>Corrosion:</b> 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.</p> <p><b>Corrosion Control:</b> Anodizing – Anodizing of aluminium. Cathodic protection - sacrificial anode and Metalcoatings – Galvanization</p> <p><b>Waste Management:</b> Introduction, sources of solid waste e-waste, effects of waste on environment and humanhealth, methods of disposal of solid waste and e-waste and its advantages</p> <p><b>Textbook:Chapter:sections:</b>  <b>Engineering Chemistry by R V Gadag:Chapter 6:Section:6.3,6.4,6.5,6.6,6.7</b>  <b>Waste Management Challenges and Opportunities in India by VarshaBhagat-Ganguly: Chapter 1,4,6: Section 1.1,4.1,6.1</b></p>	
<p><b>Pre-requisites (Self Learning)</b>  Organic coatings: Paint, components of paints and their functions. Varnish, definition, differences between paints varnishes</p>	
<p><b>RBT Levels: L1,L2,L3</b></p>	
<p><b>Module-3: Advanced Polymers</b></p>	<p><b>8 Hours</b></p>
<p><b>Polymer:</b> Introduction, Types of polymerizations, molecular weight of polymers, numerical problems on <math>M_n</math> and <math>M_w</math></p> <p><b>Engineering polymers:</b> Introduction, Synthesis and applications of CPVC Polyurethanes, Silicone rubbers.</p> <p><b>Fibers:</b> Synthesis, properties and applications of nylon fiber.</p> <p><b>Polymer composites:</b> Introduction, properties and applications of fiber reinforced polymers composites (FRPC), Kevlar fibres</p> <p><b>Geo polymer concrete:</b> Introduction, synthesis, constituents, properties and applications.</p> <p><b>Adhesives:</b> Introduction, properties and applications of epoxy resin.</p> <p><b>Textbook: Chapter:sections:Engineering Chemistry by R V Gadag: Chapter 7: Section: 7.4,7.5,7.6,7.15,7.16, Chapter 10: Section: 10.1,10.2,10.3,10.4</b></p>	
<p><b>Pre-requisites (Self Learning)</b>  Classification of polymers, synthesis,properties and applications of PMMA, epoxy resin</p>	
<p><b>RBT Levels: L1,L2,L3</b></p>	
<p><b>Module-4: Structural Materials</b></p>	<p><b>8 Hours</b></p>
<p><b>Metals and Alloys:</b> Introduction, Properties and application of Iron and its alloys, Aluminium and its alloys</p> <p><b>Cement:</b> Introduction, composition, properties, classification, manufacturing process of cement, process of setting and hardening of cement in concrete, additives for cement and testing of cement</p> <p><b>Refractories:</b> Introduction, classification based on chemical composition, properties and application of refractory materials.</p> <p><b>Glass:</b> Introduction, Composition, types, Preparation of Soda-lime glass, properties and applications of glass.</p> <p><b>Textbook: Chapter: sections; A text book of engineering chemistry by Dr S S Dar, Dr. S Sumare :Chapter 6: Section: 6.1,6.3,6.4,6.2,6.4,6.5.</b></p>	
<p><b>Pre-requisites (Self Learning)</b>  Chemistry of reinforced concrete from various sources of water (sea water, Ground water, treatedwater).</p>	
<p><b>RBT Levels: L1,L2,L3</b></p>	
<p><b>Module-5: Water analysis and Instrumental method of analysis</b></p>	<p><b>8 Hours</b></p>
<p><b>Water Chemistry:</b> Introduction, sources and impurities in water, Potable water; meaning and specifications (as per WHO standards), Hardness of water, types and determination of hardness using EDTA titration, numerical problems on hardness of water. Definition of Biological oxygen demand (BOD) and Chemical Oxygen Demand (COD), determination of COD of waste water sample and Numerical problems on COD.</p> <p><b>Chemical analysis of water:</b> Nitrates (colorimetry) and Fluorides (colorimetry). Sewage treatment: Primary, secondary (activated sludge) and tertiary methods. Softening of water by ion exchange process.</p> <p><b>Instrumental methods of analysis:</b> Theory, Instrumentation and applications of Colorimetry, Potentiometry, Conductometry (Strong acid with a strong base, weak acid with a strong base, mixture of strong acid and a weak acid with a strong base)</p> <p><b>Textbook: Chapter: sections: Engineering Chemistry by R V Gadag: Chapter 8: Section: 8.1,8.2,8.4, Chapter 10:10.1, 10.3,10.5, 10.6,</b></p>	
<p><b>Pre-requisites (Self Learning)</b>  Types of volumetric titrations (Neutralization, redox and Complexometric)</p>	



<b>RBT Levels: L1,L2,L3</b>																
<b>III(b). PRACTICAL PART</b>																
<b>Sl. No.</b>	<b>Experiments / Programs / Problems</b>															
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	Determination of acid value of biofuel															
10	Synthesis of iron oxide nanoparticles															
<b>Instructions for conduction of practical part:</b>																
<b>Instructions for conduction of practical part: Instructions for conduction of practical part:</b>																
<ul style="list-style-type: none"> <li>• Strict discipline should be maintained inside the laboratory.</li> <li>• Lab batches will be allotted at the beginning of the semester.</li> <li>• Student should enter into the lab by wearing Apron and having the Lab Manual along with a calculator and observation notebook.</li> <li>• The student should conduct one experiments in the specified time of 2hrs duration in regular lab sessions</li> <li>• All entries of the observation should be done by using black pen only. Avoid writing by pencil and overwriting</li> <li>• <b>The short procedure for the experiment must be prepared for writing in data sheet by the student before coming to the laboratory</b> 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.</li> <li>• 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.</li> </ul>																
<b>IV.COURSE OUTCOMES</b>																
<b>CO1</b>	Illustrate the principles of Green chemistry in engineering & technology.															
<b>CO2</b>	Understand the basic concepts of corrosion and waste management.															
<b>CO3</b>	Apply the knowledge of Advanced Polymers in Engineering Applications															
<b>CO4</b>	Evaluate Chemistry concept in structural materials and water Technology															
<b>CO5</b>	Analyse engineering materials to achieve practical solutions															
<b>V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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				
<b>VI.Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer Annexure section 2																
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure section 2																
<b>Semester End Examination (SEE):</b> Refer Annexure section 2																
<b>VII.Learning Resources</b>																
<b>VII(a): Textbooks:</b>																
<b>Sl. No.</b>	<b>Title of the Book</b>					<b>Name of the author</b>					<b>Edition and Year</b>			<b>Name of the publisher</b>		

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	3 <sup>rd</sup> Edition, 1996	McGrawHill Publications, New York
6	Wiley Engineering Chemistry		2 <sup>nd</sup> Edition-2013	Wiley India Pvt.Ltd. New Delhi

#### **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. Skoog et.al.	Eighth edition-2004	Thomson Asia pte Ltd
4	OLED Display Fundamentals and Applications	Takatoshi Tsujimura	2012	Wiley-Blackwell
5	Super capacitors: Materials, Systems, and Applications	Max Lu, Francois Beguin, Elzbieta Frackowiak	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=PLyhmwFtznRhuz8L1bb3X9IbHrDMjH>  
 WWH  
<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



|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	HSMC	
<b>Course Title:</b> Balake Kannada (Kannada for Usage)				
<b>Course Code:</b>	23BKAH04	<b>Credits:</b>	PP/NP	
<b>Teaching Hours/Week (L:T:P:O)</b>	1:0:0:0	<b>Total Hours:</b>	15	
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	<b>Total Marks:</b>	50
<b>SEE Type:</b>	-		<b>Exam Hours:</b>	-
<b>Course Objective : ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು :</b>				
<ul style="list-style-type: none"> <li>To create the awareness regarding the necessity of learning local language for comfortable and healthy life .</li> <li>To enable learners to Listen and understand the Kannada Language Properly.</li> <li>To Speak , Read and Write Kannada Language as per requirement.</li> <li>To train the learners for correct and polite conversation.</li> <li>To know about Karnataka State and its Language , Literature and General Information about this State.</li> </ul>				
<b>II.COURSE CONTENT</b>				
<b>Module-1</b>			<b>3 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 Kannada Language : A few Tips, Hints for Correct and Polite Conversation , Listening and Speaking activities , Key to Transcription</li> <li>ವೈಯಕ್ತಿಕ , ಸ್ವಾಮ್ಯಸೂಚಕ / ಸಂಭಂದಿತ ಸರ್ವನಾಮಗಳ ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು- Personal Pronouns, Possessive Forms, Interrogative Words</li> </ol>				
<b>Textbook: Chapter: sections:</b>				
<b>Pre-requisites (Self Learning)</b>				
<b>RBT Levels:L1, L2</b>				
<b>Module-2</b>			<b>3 Hours</b>	
<ol style="list-style-type: none"> <li>ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು ,ಸಂದೇಹಾಸ್ಪದ ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು -Possessive forms of Nouns , Dubitive Question and Relative Nouns.</li> <li>ಗುಣ ಪರಿಣಾಮ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು , ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative , Quantitative and Colour Adjectives , Numerals</li> <li>ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ , ಅದು , ಅವು , ಅಲ್ಲಿ )- Predictive Forms, Locative Case</li> </ol>				
<b>Textbook: Chapter: sections:</b>				
<b>Pre-requisites (Self Learning)</b>				
<b>RBT Levels:L1, L2</b>				
<b>Module-3:</b>			<b>3 Hours</b>	
<ol style="list-style-type: none"> <li>ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು - Dative Cases</li> </ol>				

<p>and Numerals</p> <p>2. ಸಂಖ್ಯೆಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal Numerals and Plural Markers.</p> <p>3. ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು &amp; ವರ್ಣ ಗುಣವಾಚಕಗಳು Defective / Negative Verbs and Colour Adjectives</p>																
<b>Textbook : Chapter: sections:</b>																
<b>Pre-requisites (Self Learning)</b>																
<b>RBT Levels: L1, L2</b>																
<b>Module-4</b>													<b>3 Hours</b>			
<p>1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ , ನಿರ್ದೇಶನ , ಪ್ರೋತ್ಸಹ ಮತ್ತು ಒತ್ತಾಯ ಅರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು - Permission , Commands, Encouraging and urging words (Imperative Words and Sentences)</p> <p>2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು Accusative Cases and Potential Forms used in General Communication</p> <p>3. ಇರು ಮತ್ತು ಇರಲ್ಲ ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು , ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು - Helping Verbs “iru” and “iralla” , corresponding Future and Negation Verbs.</p> <p>4. ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ , ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ - Comparative , Relationship , Identification and Negation Verbs</p>																
<b>Pre-requisites (Self Learning)</b>																
<b>RBT Levels: L1, L2</b>																
<b>Module-5</b>													<b>3 Hours</b>			
<p>1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು Different types of Tense, Time and Verbs</p> <p>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</p> <p>3. Kannada vocabulary list : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation</p>																
<b>RBT Levels: L1, L2</b>																
<b>III.COURSE OUTCOMES</b>																
<p>ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಂಶಗಳು : At the end of the course student will be able to:</p>																
<b>CO1</b>		To create the awareness regarding the necessity of learning local language for comfortable and healthy life .														
<b>CO2</b>		To enable learners to Listen and understand the Kannada Language Properly.														
<b>CO3</b>		To Speak , Read and Write Kannada Language as per requirement.														
<b>CO4</b>		To train the learners for correct and polite conversation.														
<b>CO5</b>		To know about Karnataka State and its Language , Literature and General Information about this State.														
<b>IV.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
PO/PSO	1	2	3	4	5	6	7	8	9	10	11	12	S1	S2	S3	S4
CO1																
CO2																
CO3																
CO4																
CO5																



<b>V.Assessment Details (CIE &amp; SEE)</b>				
<b>General Rules:</b> Refer Annexure section 7				
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure section 7				
<b>Semester End Examination (SEE):</b> Refer Annexure section 7				
<b>VI.Learning Resources</b>				
<b>VII(a): Textbooks:</b>				
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>	<b>Name of the publisher</b>	<b>Edition and Year</b>
1	Balake Kannada	Dr. Timmesha	Prasaranga, VTU, Belagavi	2018
<b>VII(c): Web links and Video Lectures (e-Resources):</b>				
1. VTU Website				
<b>VIII: Activity Based Learning</b>				
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				



|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	HSMC		
<b>Course Title:</b> ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ - ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ					
<b>Course Code:</b>	23SKAH03		<b>Credits:</b>	PP/NP	
<b>Teaching Hours/Week (L:T:P:O)</b>	1:0:0:0		<b>Total Hours:</b>	15	
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	-	<b>Total Marks:</b>	50
<b>SEE Type:</b>	-			<b>Exam Hours:</b>	-
<b>Course Objective:</b> ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು :					
<ul style="list-style-type: none"> <li>• ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ , ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು .</li> <li>• ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳ ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸುವುದು.</li> <li>• ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.</li> <li>• ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.</li> <li>• ಸಾಂಸ್ಕೃತಿಕ , ಜಾನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಸುವುದು .</li> </ul>					
<b>I. COURSE CONTENT</b>					
<b>ಘಟಕ- 01 ಕನ್ನಡ ಸಂಸ್ಕೃತಿ ಮತ್ತು ಭಾಷೆ ಕುರಿತಾದ ಲೇಖನಗಳು</b>				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					
<b>Textbook: Chapter: sections:</b> ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ್.					
<b>Pre-requisites (Self Learning)</b>					
RBT Levels:L1, L2					
<b>ಘಟಕ -02 ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ</b>				3 Hours	
01.ವಚನಗಳು:ಬಸವಣ್ಣ,ಅಕ್ಕಮಹಾದೇವಿ,ಅಲ್ಲಮಪ್ರಭು,ಆಯ್ತಕ್ಕಿಮಾರಯ್ಯ, ಜೀಡರದಾಸಿಮಯ್ಯ , ಆಯ್ತಕ್ಕಿ ಲಕಮ್ಮ 02. ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ - ಪುರಂದರದಾಸರು 03. ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುತ್ತ - ಶಿಶುನಾಳ ಶರೀಫ					
<b>Textbook: Chapter: sections:</b> ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ್.					
<b>Pre-requisites (Self Learning)</b>					
RBT Levels:L1, L2					
<b>ಘಟಕ - 03 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ</b>				3 Hours	
01. ಡಿ.ವಿ.ಜಿ. ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗದಿಂದ ಆಯ್ದ ಕೆಲವು ಭಾಗಗಳು 02. ಕುರುಡುಕಾಂಚಾಣ : ದಾ. ರಾ ಬೇಂದ್ರೆ 03. ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು					
<b>Textbook : Chapter: sections:</b> ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ ಡಾ . ಹಿ. ಚಿ. ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ್.					
<b>Pre-requisites (Self Learning)</b>					

<b>RBT Levels: L1, L2</b>																
<b>ಘಟಕ -04 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ</b>														3 Hours		
01. ಡಾ . ಸರ್ . ಎಂ . ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹಾಸ - ಎ. ಎನ್ . ಮೂರ್ತಿರಾವ್ 02. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ ಘಟಕ																
<b>Textbook: Chapter: sections: : ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ</b> ಡಾ . ಹಿ . ಚಿ . ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ																
<b>Pre-requisites (Self Learning)</b>																
<b>RBT Levels: L1, L2</b>																
<b>ಘಟಕ - 05 ಸಾಂಸ್ಕೃತಿಕ , ಜಾನಪದ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ</b>														3 Hours		
01. ಯುಗಾದಿ : ವಸುದೇಂದ್ರ 02. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ . ಚಿ . ಬೋರಲಿಂಗಯ್ಯ																
<b>Textbook: Chapter: Sections: ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ : ವಿಟಿಯು ನಿಗದಿಪಡಿಸಿಲಾದ ಪುಸ್ತಕ</b> ಡಾ . ಹಿ . ಚಿ . ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ																
<b>Pre-requisites (Self Learning)</b>																
<b>RBT Levels: L1, L2</b>																
<b>II. COURSE OUTCOMES</b>																
<b>ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ (23SKAH03) ಪಠ್ಯ ಕಲಿಕೆಯ ನಂತರ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ :</b>																
<b>CO1</b> ಕನ್ನಡ ಭಾಷೆ , ಸಾಹಿತ್ಯ , ಮತ್ತು ಕನ್ನಡ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡುವುದು.																
<b>CO2</b> ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳ ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ , ಮತ್ತು ಜ್ಞಾನಕೆ ಸ್ಪೂರ್ತಿ ಮೂಡುತ್ತದೆ.																
<b>CO3</b> ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಹೆಚ್ಚಾಗುತ್ತದೆ																
<b>CO4</b> ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕ ಹೆಚ್ಚಾಗುತ್ತದೆ																
<b>CO5</b> ಸಾಂಸ್ಕೃತಿಕ , ಜಾನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.																
<b>III. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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						
<b>IV. Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer Annexure section 7																
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure section 7																
<b>Semester End Examination (SEE):</b> Refer Annexure section 7																
<b>V. Learning Resources</b>																
<b>VII(a): Textbooks::</b>																
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>	<b>Name of the publisher</b>	<b>Edition and Year</b>												
1	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ	ಡಾ . ಹಿ . ಚಿ . ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ . ಎಲ್ . ತಿಮ್ಮೇಶ	ವಿಟಿಯು ಪ್ರಸಾರಾಂಗ	2018												
<b>VII(c): Web links and Video Lectures (e-Resources):</b>																
<b>VIII: Activity Based Learning</b>																
Assignments, quiz.																



|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	HSMC		
<b>Course Title:</b> Professional Skills and English					
<b>Course Code:</b>	23ENGH01		<b>Credits:</b>	PP/NP	
<b>Teaching Hours/Week (L:T:P:O)</b>			0:1:1:0	<b>Total Hours:</b>	30
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	--	<b>Total Marks:</b>	50
<b>SEE Type:</b>	-			<b>Exam Hours:</b>	--
<b>I. Course Objective</b>					
<ul style="list-style-type: none"> <li>This course aims at achieving fluency and confidence in spoken and written English.</li> <li>Acquiring wide range of vocabulary and linguistic competence that is required for functional performance.</li> <li>Building elementary foundations for the knowledge related to conventions and use of language in society, particularly in speaking and listening skills</li> <li>Developing the basic skills for creative reading and writing with precision</li> </ul>					
<b>II. COURSE CONTENT</b>					
<b>Module-1: Introduction to Communicative English</b>					Hrs: T/4 L/1
<p>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.</p> <p><b>Grammar Focus:</b> Basic English Grammar, Parts of speech.</p> <p><b>Activity:</b> Peer- Based Exercises to Ignite conversation. Allow students to interact with each other; talk about their Special Skill, Hobbies and Passion.</p> <p><b>Textbook: Chapter: sections:</b> Discussion and coverage of contents as suggested in PART-01: .1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.11, 1.13 of textbook 1.</p> <p><b>Pre-requisites (Self Learning):</b> Basics Of Grammar learnt in PUC- Parts of Speech.</p> <p><b>RBT Levels:</b>L1, L2 and L3</p>					
<b>Module-2: Listening Skills</b>					Hrs: T/4 L/1
<p><b>Introduction to Phonetics:</b> Sounds and Symbols of vowels, Consonants, Diphthongs, Syllables Silent and Non-Silent letters. Pronunciation of 'The', Homophones and Homonyms.</p> <p><b>Importance Of Listening:</b> Difference between Hearing and Listening, Active Listening, Types of Listening, Barriers in Listening, Note taking, Active response, Empathy and Perspective- taking, Building Listening Habits.</p> <p><b>Activity:</b> Scenario – Based Activity</p> <p><b>Textbook: Chapter: sections:</b> Discussion and coverage of contents in <b>Part -02:</b> 7.1, 7.2, 7.6, 8.7. <b>Part-03:</b> 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.</p> <p><b>Pre-requisites (Self Learning):</b> Audio Track listening such as Podcasts, Audio Books, Language Learning to improve Pronunciation , Comprehension and over all Language Skills.</p> <p><b>RBT Levels:</b>L1, L2 and L3</p>					
<b>Module-3: Introduction to Speaking Skills</b>					Hrs: T/4 L/1
<p>Developing Vocabulary, Paraphrasing conversations, Paraphrasing content, Common Errors in Pronunciation. Importance of Non verbal communication [Body Language, Para linguistic</p>					

<p>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 &amp; Don'ts. Assertive Communication skills, Answering to the Point following 7C's of communication. Extempore and Public Speaking.</p> <p>Grammar focus: Reported Speech, Voice, One -word Substitution, Prefix and Suffix.</p> <p><b>Activity:</b> GD</p>																
<p><b>Textbook : Chapter: sections:</b> Discussion and coverage of contents in  <b>Part- 04:</b> 10.1, 10.2, 10.3, 11.1, 11.2, 11.3, 12, 13 of textbook 01.</p>																
<p><b>Pre-requisites (Self Learning)</b>  Basic English Grammar, Pronunciation, Speaking on general topics</p>																
<p><b>RBT Levels:</b> L1, L2 and L3</p>																
<p><b>Module-4: Introduction to Reading Skills</b></p>														<p>Hrs: T/4 L/1</p>		
<p>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.</p> <p>Reading Job advertisements, understanding Job specifications, requirements in application form [Job or for higher studies].</p> <p><b>Grammar focus:</b> Subject verb agreement, use of Active verbs, Sequence of Tenses.</p> <p><b>Activity:</b> Book review [Fiction&amp; Non- Fiction], News Paper article reading, Magazine and Journals review.</p>																
<p><b>Textbook: Chapter: sections: :</b> Discussion and coverage of contents in PART-05: 17.1, 17.2, 17.3, 17.7, 17.8, 17.9, 17.10, of textbook 01.</p>																
<p><b>Pre-requisites (Self Learning):</b> Basic Reading skills.</p>																
<p><b>RBT Levels:</b> L1, L2 and L3</p>																
<p><b>Module-5: Introduction to Writing Skills</b></p>														<p>Hrs: T/4 L/1</p>		
<p>Techniques in Paragraph Writing, Organizing Principles of Paragraphs in Documents, Reportwriting; Long and Short, Punctuations, Emails, Blog writing, Resume and Cover Letter writing.</p> <p><b>Grammar focus :</b> Misplaced Modifiers, Idioms and Phrases</p> <p><b>Activity:</b> Students write a short Article and Report on Recent Technological Innovations.</p>																
<p><b>Textbook: Chapter: Sections:</b> 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.</p>																
<p><b>Pre-requisites (Self Learning):</b> Basic English Grammar, Vocabulary.</p>																
<p><b>RBT Levels:</b> L1, L2 and L3</p>																
<p><b>III. COURSE OUTCOMES</b></p>																
<p><b>CO1</b></p>		<p>Develop the ability to speak English language with the right way of pronunciation.</p>														
<p><b>CO2</b></p>		<p>Practice listening effectively to communication in English.</p>														
<p><b>CO3</b></p>		<p>Express the viewpoints with confidence in English.</p>														
<p><b>CO4</b></p>		<p>Implement English vocabulary at command and language proficiency.</p>														
<p><b>CO5</b></p>		<p>Perform well in campus recruitment, engineering and all other general competitive examinations.</p>														
<p><b>IV. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b></p>																
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						
<p><b>V. Assessment Details (CIE &amp; SEE)</b></p>																
<p><b>General Rules:</b> Refer Annexure Section 7</p>																
<p><b>Continuous Internal Evaluation (CIE):</b> Refer Annexure Section 7</p>																



**Semester End Examination (SEE): Refer Annexure Section 7****VI.Learning Resources****VII(a): Textbooks:**

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

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

<b>1</b>	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	02 <sup>nd</sup> Ed., 2018
<b>2</b>	English Grammar	Krishnaswamy, Subashree .	New York: Cambridge University Press.	04 <sup>th</sup> Ed., 2018

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



|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	HSMC		
<b>Course Title:</b> Constitution of India and Professional Ethics					
<b>Course Code:</b>	23CIPH05		<b>Credits:</b>	1	
<b>Teaching Hours/Week (L:T:P)</b>			1:0:0:0	<b>Total Hours:</b>	15
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	2
<b>I. Course Objectives:</b>					
<p>The course Indian Constitution will enable the students,</p> <ul style="list-style-type: none"> <li>To know about the basic structure of Indian Constitution.</li> <li>To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.</li> <li>To know about our Union Government, political structure &amp; codes, procedures.</li> <li>To know the State Executive &amp; Elections system of India.</li> <li>To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.</li> </ul>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
<p>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.</p>					
<b>III. COURSE CONTENT</b>					
<b>Module-1: Indian Constitution</b>				3 Hours	
<p><b>Indian Constitution:</b> 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 &amp; Key concepts of the Preamble. Salient features of India Constitution. <b>Text Book:</b> "Introduction to the Constitution of India", (Students Edition.) by Durga Das Basu. <b>RBT Levels:</b> L1, L2</p>					
<b>Module-2: FR's, FD's and DPSP's</b>				03 Hours	
<p>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 Nationbuilding. <b>Text Book:</b> "Constitution of India" by M V Pylee. <b>RBT Levels:</b> L1, L2</p>					
<b>Module-3: Union Executive</b>				3 Hours	
<p><b>Union Executive:</b> Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism. <b>Text Book:</b> "Introduction to the Constitution of India", (Students Edition.) by Durga Das Basu. <b>RBT Levels:</b> L1, L2</p>					

<b>Module-4: State Executive &amp; Elections</b>												3 Hours				
<b>State Executive &amp; Elections, Amendments and Emergency Provisions:</b> State Executive, Election Commission, Elections & Electoral Process. Amendment to Constitution (How and Why) and Important Constitutional Amendments till today. Emergency Provisions. <b>Text Book:</b> “Constitution of India” by M V Pylee. <b>RBT Levels:</b> L1, L2																
<b>Module-5: Professional Ethics</b>												3 Hours				
<b>Professional Ethics:</b> 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 <b>Text Book:</b> “Engineering Ethics”, M.Govindarajan, S.Natarajan, V.S.Senthilkuma <b>RBT Levels:</b> L1, L2																
<b>IV.COURSE OUTCOMES</b>																
<b>CO1</b>	Analyse the basic structure of Indian Constitution.															
<b>CO2</b>	Outline the Fundamental Rights, DPSP’s and Fundamental Duties (FD’s) of our constitution.															
<b>CO3</b>	Extend knowledge about Union and State Government, Elections system of India & Amendments.															
<b>CO4</b>	Outline the importance of Engineering Ethics															
<b>V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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				
<b>VI.Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer Annexure Section 6																
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure Section 6																
<b>Semester End Examination (SEE):</b> Refer Annexure Section 6																
<b>VII.Learning Resources</b>																
<b>VII(a): Textbooks</b>																
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>				<b>Edition and Year</b>				<b>Name of the publisher</b>						
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						
<b>VII(b): Reference Books</b>																
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				16 <sup>th</sup> Edition				Vikas Publication						
<b>VII(c): Web links and Video Lectures (e-Resources):</b>																
<a href="https://www.studyiq.com/articles/important-articles-of-the-indian-constitution/">https://www.studyiq.com/articles/important-articles-of-the-indian-constitution/</a>																
<a href="https://byjus.com/free-ias-prep/constitution-of-india-an-overview/">https://byjus.com/free-ias-prep/constitution-of-india-an-overview/</a>																

**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



|| 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)



<b>Semester:</b>	I/II	<b>Course Type:</b>	HSMC		
<b>Course Title:</b> Environmental Studies					
<b>Course Code:</b>	23ENVH02		<b>Credits:</b>	01	
<b>Teaching Hours/Week (L:T:P)</b>			1:0:0:0	<b>Total Hours:</b>	15
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory			<b>Exam Hours:</b>	2
<b>I. Course Objectives:</b>					
<ul style="list-style-type: none"> <li>• To create environmental awareness among the students.</li> <li>• To gain knowledge on different types of pollution in the environment.</li> </ul>					
<b>II. 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. 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 progress the students in theoretical, applied and practical skills.</li> <li>2. Environmental awareness program for the in-house campus</li> <li>3. Encourage collaborative (Group Learning) Learning in the class.</li> <li>4. Seminars, surprise tests and Quizzes may be arranged for students in respective subjects to develop skills.</li> </ol>					
<b>III. COURSE CONTENT</b>					
<b>Module-1</b>					3 Hours
<b>Introduction to Environmental Studies:</b> 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. <b>Textbook:</b> Bharucha, E. (2015). Textbook of Environmental Studies <b>RBT Levels:</b> L1, L2					
<b>Module-2</b>					3 Hours
<b>Natural Resources:</b> 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. <b>Energy</b> – 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. <b>Textbook:</b> “Environmental Studies”, by Benny Joseph <b>RBT Levels:</b> L1, L2					
<b>Module-3</b>					3 Hours
<b>Environmental Pollution</b> (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution. <b>Waste Management &amp; Public Health Aspects:</b> Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes; Industrial and Municipal Sludge. <b>Textbook:</b> Environmental Science- Principles and Practices, by Das R.C <b>RBT Levels:</b> L1, L2					



<b>Module-4</b>											3 Hours					
<b>Global Environmental Concerns</b> (Concept, policies and case-studies): Ground water depletion/recharging, Climate Change; Acid Rain; Ozone Depletion; Radon and Fluoride problem in drinking water; Resettlement and rehabilitation of people, Environmental Toxicology. <b>Textbook:</b> “Environmental Studies – From Crisis to Cure” by R Rajagopalan <b>RBT Levels:</b> L1, L2																
<b>Module-5</b>											3 Hours					
<b>Latest Developments in Environmental Pollution Mitigation Tools</b> (Concept and Applications): G I S. & Remote Sensing, Environment Impact Assessment, Environmental Management Systems, ISO14001; Environmental Stewardship- NGOs. <b>Field work:</b> Visit to an Environmental Engineering Laboratory or Green Building or Water Treatment Plant or Waste water treatment Plant; ought to be Followed by understanding of process and its brief documentation <b>Textbook:</b> Environmental and Pollution Science. Pepper I.L., Gerba C.P. & Brusseau M.L. <b>RBT Levels:</b> L1, L2																
<b>IV. COURSE OUTCOMES</b>																
<b>CO1</b>	To identify the major challenges in environmental issues and evaluate possible solutions.															
<b>CO2</b>	Develop analytical skills, critical thinking and demonstrate socio-economic skills for sustainable development.															
<b>CO3</b>	To analyze an overall impact of specific issues and develop environmental management plan.															
<b>V.CO-PO-PSO MAPPING</b> (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				
<b>VI. Assessment Details (CIE &amp; SEE)</b>																
<b>General Rules:</b> Refer Annexure Section 6																
<b>Continuous Internal Evaluation (CIE):</b> Refer Annexure Section 6																
<b>Semester End Examination (SEE):</b> Refer Annexure Section 6																
<b>VII. Learning Resources</b>																
<b>VII(a): Textbooks</b>																
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>					<b>Edition and Year</b>					<b>Name of the publisher</b>				
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.				
<b>VII(b): Reference Books</b>																

1	Principals of Environmental Science and Engineering	Raman Sivakumar	2 <sup>nd</sup> 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:**

--



|| 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)



<b>Semester:</b>	I	<b>Course Type:</b>	NCMC	
<b>Course Title:</b> Personality Development-1				
<b>Course Code:</b>	23PDSN01	<b>Credits:</b>	PP/NP	
<b>Teaching Hours/Week (L:T:P:O)</b>		0:0:0:2	<b>Total Hours:</b>	24
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	-	<b>Total Marks:</b> 50
<b>SEE Type:</b>	-		<b>Exam Hours:</b>	-
<b>I. Course Objectives:</b>				
<ol style="list-style-type: none"> <li>Explore techniques to boost self-esteem and overcome self-doubt</li> <li>Learn effective techniques for structuring and delivering presentations</li> <li>Recognizing the Role of Aptitude in Placement</li> <li>Learn to express thoughts and ideas clearly and confidently.</li> <li>Improve overall language proficiency and grammatical accuracy.</li> </ol>				
<b>II. Teaching-Learning Process (General Instructions):</b>				
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>Lecturer method (L) need not to be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.</li> <li>Use of Video/Animation to explain functioning of various concepts.</li> <li>Encourage collaborative (Group Learning) Learning in the class.</li> <li>Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.</li> <li>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>Introduce Topics in manifold representations.</li> <li>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.</li> <li>Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.</li> </ol>				
<b>III. COURSE CONTENT</b>				
<b>III(a).Theory PART</b>				
<b>Module-1:</b> Personality Development and Presentation skills				5 Hours
Self-Introduction Tips, Ways to Improve Self Confidence, Art of Story Telling and presentation Skills, Five beats of story telling, Activity(Story narration by students) and basics of presentation slides making, Body language and postures.				
<b>Pre-requisites (Self Learning)</b>				
<b>Module-2:</b> Overview of Aptitude,Problems on Number series and Simplification				5 Hours
Aptitude concept, Basic idea on how Aptitude helps in getting placed, What are the benefits in learning Aptitude, Vedic Maths Techniques, Problems on Number series and puzzles, Problems on Simplification.				
<b>Pre-requisites (Self Learning)</b>				

<b>Module-3:Public Speaking and Etiquette</b>													4 Hours			
Art of improving Communication skills, Public Speaking, Stage Presence, formal dressing, networking, etiquette ,Campus Interview and Portfolio ,Business Etiquettes, Meeting Etiquettes, Social Etiquettes.																
<b>Pre-requisites (Self Learning)</b>																
<b>Module-4: Grammar and Verbal Aptitude</b>													6 Hours			
Articles, Prepositions and Spotting the Errors, Verbal aptitude concept, Problems on seating arrangement, Activity (Team Building).																
<b>Pre-requisites (Self Learning)</b>																
<b>Module-5:Reasoning</b>													4 Hours			
Data sufficiency and Assessment																
<b>Pre-requisites (Self Learning)</b>																
<b>IV.COURSE OUTCOMES</b>																
<b>CO1</b>		To improve verbal ability skill and communicative skill of the students														
<b>CO2</b>		To improve verbal ability skill and communicative skill of the students														
<b>CO3</b>		Students will communicate effectively & appropriately in real life situation														
<b>CO4</b>		It will enhance students problem solving skill.														
<b>CO5</b>		Students will be able to prepare for various public and private sector exams & placement drives.														
<b>V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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				
<b>VI.Assessment Details (CIE)</b>																
<b>General Rules:</b> Refer appendix section 8																
<b>Continuous Internal Evaluation (CIE):</b> Refer appendix section 8																
<b>Semester End Examination (SEE):</b> Refer appendix section 8																
<b>VII.Learning Resources</b>																
<b>VII(b): Reference Books:</b>																
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						
<b>VII(c): Web links and Video Lectures (e-Resources):</b>																

<https://swayam.gov.in/explorer>

<https://nptel.ac.in/courses>

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

Mention suggested Activities like

seminar

assignments

quiz

mini 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)



<b>Semester:</b>	II	<b>Course Type:</b>	NCMC		
<b>Course Title:</b> Personality Development-2					
<b>Course Code:</b>	23PDSN02		<b>Credits:</b>	PP/NP	
<b>Teaching Hours/Week (L:T:P:O)</b>			0:0:0:2	<b>Total Hours:</b>	24
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	-	<b>Total Marks:</b>	50
<b>SEE Type:</b>	-			<b>Exam Hours:</b>	00
<b>I. Course Objectives:</b>					
<ol style="list-style-type: none"> <li>1. Explore techniques to boost self-esteem and overcome self-doubt</li> <li>2. Learn effective techniques for structuring and delivering presentations</li> <li>3. Recognizing the Role of Aptitude in Placement</li> <li>4. Learn to express thoughts and ideas clearly and confidently.</li> <li>5. Improve overall language proficiency and grammatical accuracy.</li> </ol>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>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.</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 with different circuits/logic 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 improve the students' understanding.</li> </ol>					
<b>III. COURSE CONTENT</b>					
<b>III(a). Theory PART</b>					
<b>Module-1:</b> Personality Development and Presentation skills				5 Hours	
Self-Introduction Tips, Ways to Improve Self Confidence, Art of Story Telling and presentation Skills, Five beats of story telling, Activity (Story narration by students) and basics of presentation slides making, Body language and postures.					

<b>Pre-requisites (Self Learning)</b>																
<b>Module-2:</b> Overview of Aptitude,Problems on Number series and Simplification														5 Hours		
Aptitude concept, Basic idea on how Aptitude helps in getting placed, What are the benefits in learning Aptitude, Vedic Maths Techniques, Problems on Number series and puzzles, Problems on Simplification.																
<b>Pre-requisites (Self Learning)</b>																
<b>Module-3:</b> Public Speaking and Etiquette														4 Hours		
Art of improving Communication skills, Public Speaking, Stage Presence, formal dressing, networking, etiquette ,Campus Interview and Portfolio ,Business Etiquettes, Meeting Etiquettes, Social Etiquettes.																
<b>Pre-requisites (Self Learning)</b>																
<b>Module-4:</b> Grammar and Verbal Aptitude														6 Hours		
Articles, Prepositions and Spotting the Errors, Verbal aptitude concept, Problems on seating arrangement, Activity (Team Building).																
<b>Pre-requisites (Self Learning)</b>																
<b>Module-5:</b> Reasoning														4 Hours		
Data sufficiency and Assessment																
<b>Pre-requisites (Self Learning)</b>																
<b>IV.COURSE OUTCOMES</b>																
<b>CO1</b>		To improve verbal ability skill and communicative skill of the students														
<b>CO2</b>		To improve verbal ability skill and communicative skill of the students														
<b>CO3</b>		Students will communicate effectively & appropriately in real life situation														
<b>CO4</b>		It will enhance students problem solving skill.														
<b>CO5</b>		Students will be able to prepare for various public and private sector exams & placement drives.														
<b>V.CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
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				
<b>VI.Assessment Details (CIE)</b>																
<b>General Rules:</b> Refer appendix section 8																
<b>Continuous Internal Evaluation (CIE):</b> Refer appendix section																
<b>Semester End Examination (SEE):</b> Refer appendix section																
<b>VII.Learning Resources</b>																
<b>VII(b): Reference Books:</b>																
1	The power of habit	CHARLES DUHIGG'S BLOG				2007				Good readers						
2	Never Split the Difference: Negotiating as	Chris Voss				2015				Good readers						

	if Your Life Depended on It			
3	Thinking, Fast and Slow Hardcover	Daniel Kahneman	2011	Good readers
<b>VII(c): Web links and Video Lectures (e-Resources):</b>				
<a href="https://swayam.gov.in/explorer">https://swayam.gov.in/explorer</a>				
<a href="https://nptel.ac.in/courses">https://nptel.ac.in/courses</a>				
<b>VIII: Activity Based Learning / Practical Based Learning/Experiential learning:</b>				
Mention suggested Activities like seminar assignments quiz mini projects				



<b>Semester:</b>	I	<b>Course Type:</b>	AEC		
<b>Course Title:</b> WEB 2.0 (HTML, CSS & JAVASCRIPT) { Skill Development Course-1 (EWDP) }					
<b>Course Code:</b>	23CVAE11			<b>Credits:</b>	1
<b>Teaching Hours/Week (L:T:P:O)</b>		0:1:1:1		<b>Total Hours:</b>	40
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory/practical/other assessment(practical)			<b>Exam Hours:</b>	02
<b>I. Course Objectives:</b>					
<ul style="list-style-type: none"> <li>• Learn Web tool box and history of web browsers</li> <li>• Learn HTML, XHTML tags with utilizations.</li> <li>• Know CSS with dynamic document utilizations.</li> <li>• Learn JavaScript with Element access in JavaScript</li> <li>• Logically plan and develop web pages..</li> </ul>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>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.</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 analysed 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 with different circuits/logic 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 improve the students' understanding.</li> </ol>					
<b>III. COURSE CONTENT</b>					
<b>Module-1</b>					8 Hours
<b>Introduction to Web Programming:</b> Internet, WWW, Web Browsers, and Web Servers, URLs, MIME, HTTP, Security, The Web Programmers Toolbox.					
Textbook 1: Chapter 1 (1.1 to 1.9 )					
<b>Pre-requisites (Self Learning)</b>					

<b>RBT Levels: L1 and L2</b>																
<b>Module-2:</b>														8 Hours		
<b>HTML and XHTML</b> : 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 )																
<b>Pre-requisites (Self Learning) : HTML</b>																
<b>RBT Levels:L1 , L2</b>																
<b>Module-3:</b>														8 Hours		
<b>CSS:</b> 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)																
<b>Pre-requisites (Self Learning) ; HTML</b>																
<b>RBT Levels: L2 , L3</b>																
<b>Module-4:</b>														8 Hours		
<b>Java Script – I:</b> 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)																
<b>Pre-requisites (Self Learning) : HTML and CSS</b>																
<b>RBT Levels: L2 , L3</b>																
<b>Module-5:</b>														8 Hours		
<b>Java Script – II:</b> 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)																
<b>Pre-requisites (Self Learning) :</b>																
<b>RBT Levels: L3</b>																
<b>IV. COURSE OUTCOMES</b>																
<b>CO1</b>	Describe the fundamentals of web and concept of HTML.															
<b>CO2</b>	Use the Concepts of HTML , XHTML to construct the web pages .															
<b>CO3</b>	Interpret CSS for Dynamic Documents.															
<b>CO4</b>	Evaluate different concepts of JS and Construct Dynamic Documents															
<b>CO5</b>	Design a small project using HTML ,CSS and JavaScript															
<b>V. CO-PO-PSO MAPPING (mark H=3; M=2; L=1)</b>																
<b>PO/PSO</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>PS1</b>	<b>PS2</b>	<b>PS3</b>	<b>PS4</b>
<b>CO1</b>	2		2		2											
<b>CO2</b>	2		2		2											
<b>CO3</b>	2		2		2											



<b>CO4</b>	2		2		2										
<b>CO5</b>	2		2		2										
<b>VI. Assessment Details (CIE &amp; SEE)</b>															
<b>General Rules:</b> Refer appendix section 5															
<b>Continuous Internal Evaluation (CIE):</b> Refer appendix section 5															
<b>Semester End Examination (SEE):</b> Refer appendix section 5															
<b>VII. Learning Resources</b>															
<b>VII(a): Text Books</b>															
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>	<b>Edition and Year</b>	<b>Name of the publisher</b>											
1	Programmin g the World Wide Web	Robert W Sebesta	6 <sup>th</sup> Edition, 2008	Pearson Education											
<b>VII(b): Reference Books</b>															
<b>Sl. No.</b>	<b>Title of the Book</b>	<b>Name of the author</b>	<b>Edition and Year</b>	<b>Name of the publisher</b>											
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											
<b>VII(c): Web links and Video Lectures (e-Resources):</b>															
Introduction to web Development : <a href="https://www.youtube.com/watch?v=l1EssrLxt7E&amp;list=PLfqMhTWNBT3H6c9OGXb5_6wcc1Mca52n">https://www.youtube.com/watch?v=l1EssrLxt7E&amp;list=PLfqMhTWNBT3H6c9OGXb5_6wcc1Mca52n</a>															
Introduction to HTML , CSS , Java Script : <a href="https://www.youtube.com/watch?v=6mbwJ2xhgzM&amp;list=PLu0W_9lII9agiCUZYRsvtGTXdxkzPyItg">https://www.youtube.com/watch?v=6mbwJ2xhgzM&amp;list=PLu0W_9lII9agiCUZYRsvtGTXdxkzPyItg</a>															
Tutorial Link: 1. <a href="http://www.tutorialspoint.com">http://www.tutorialspoint.com</a> 2. <a href="http://www.w3schools.com">http://www.w3schools.com</a>															
<b>VIII: Activity Based Learning / Practical Based Learning/Experiential learning:</b>															
Demonstration of Simple Projects															



<b>Semester:</b>	II	<b>Course Type:</b>	AEC		
<b>Course Title:</b> INTRODUCTION TO PYTHON PROGRAMMING { Skill Development Course-2 (EWDP) }					
<b>Course Code:</b>	23CVAE21			<b>Credits:</b>	1
<b>Teaching Hours/Week (L:T:P:O)</b>		0:1:1:1		<b>Total Hours:</b>	40
<b>CIE Marks:</b>	50	<b>SEE Marks:</b>	50	<b>Total Marks:</b>	100
<b>SEE Type:</b>	Theory/practical/other assessment(practical)			<b>Exam Hours:</b>	02
<b>I. Course Objectives:</b>					
<ul style="list-style-type: none"> <li>Learn the syntax and semantics of the Python programming language.</li> <li>Illustrate the process of structuring the data using lists, tuples.</li> <li>Demonstrate the use of built-in functions to navigate the file system.</li> <li>Implement the Object-Oriented Programming concepts in Python.</li> </ul>					
<b>II. Teaching-Learning Process (General Instructions):</b>					
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>Lecturer method (L) need not to be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.</li> <li>Use of Video/Animation to explain functioning of various concepts.</li> <li>Encourage collaborative (Group Learning) Learning in the class.</li> <li>Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.</li> <li>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.</li> <li>Introduce Topics in manifold representations.</li> <li>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.</li> <li>Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.</li> </ol>					
<b>III. COURSE CONTENT</b>					
<b>Module-1</b>					8 Hours
<p><b>Python Basics:</b> Difference between basic programming Language and Python, Python History, Python Operators and Operator Precedence, Keywords &amp; Identifier, Statements &amp; Comments, Python Data types.</p> <p><b>Lists:</b> The List Data Type, Working with Lists, Augmented Assignment Operators, Methods,</p>					

Example.	
<b>Dictionaries and Structuring Data:</b> The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things.	
Textbook 1: Chapter 1-3	
<b>Pre-requisites (Self Learning)</b>	
<b>RBT Levels: L1 and L2</b>	
<b>Module-2:</b>	8 Hours
<b>Flow control:</b> Python if...else, Python for and while Loop, break, Continue and Pass Statement. <b>Functions:</b> 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)	
<b>Pre-requisites (Self Learning) : HTML</b>	
<b>RBT Levels:L1 , L2</b>	
<b>Module-3:</b>	8 Hours
<b>Manipulating Strings:</b> Working with Strings, Useful String Methods. <b>Exception Handling:</b> Common Exceptions, User-defined Exception Declaring multiple Exception, Raising Exception, Python Directory.	
Textbook 1 : Chapter 6, 8	
<b>Pre-requisites (Self Learning) ; HTML</b>	
<b>RBT Levels: L2 , L3</b>	
<b>Module-4:</b>	8 Hours
<b>File handling:</b> Reading from a file, writing to a file, Reading and writing CSV file Reading and writing Excel file, Python Classes, Python Objects, Operator Overloading. <b>Python Modules:</b> Create Module and Standard module.	
Textbook 1: Chapter 9-10	
<b>Pre-requisites (Self Learning) : HTML and CSS</b>	
<b>RBT Levels: L2 , L3</b>	
<b>Module-5:</b>	8 Hours
<b>Classes and objects:</b> Inheritance, Multiple Inheritance, Python Namespace, Programmer-defined types. <b>Classes and methods:</b> Object-oriented features, Printing objects, Another example, A more complicated example, The init method, The __str__ method, Operator overloading, Type-based dispatch.	
Text Book 2 : Chapter 15-17	
<b>Pre-requisites (Self Learning) :</b>	
<b>RBT Levels: L3</b>	
<b>IV. COURSE OUTCOMES</b>	

<b>CO1</b>	Demonstrate proficiency in handling loops and creation of functions.
<b>CO2</b>	Identify the methods to create and manipulate lists, tuples and dictionaries.
<b>CO3</b>	Develop programs for string processing and file organization
<b>CO4</b>	Interpret the concepts of Object-Oriented Programming as used in Python.
<b>CO5</b>	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
<b>CO1</b>	2		2		2											
<b>CO2</b>	2		2		2											
<b>CO3</b>	2		2		2											
<b>CO4</b>	2		2		2											
<b>CO5</b>	2		2		2											

**VI Learning Resources**

1. Al Sweigart, “Automate the Boring Stuff with Python”, 1<sup>st</sup> 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”, 2<sup>nd</sup> 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%20%20%20400%20exercises%20and%20solutions%20for%20beginners.pdf>



### 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. consid. red marks	min. pass %	Max. cond. marks	Max. consid. red 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 (Successful) 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 separately**





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

# SJB Institute of Technology

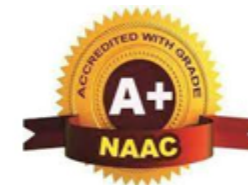
BGS Health and Education City, Dr. Vishnuvardhana Road, Kengeri, Bengaluru-560060

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)



## 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
<b>1. BSC/ESC/PCC/ ETC/PEC/OEC – Theory Course (03 &amp; 04 Credit courses)</b>		
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.		
<p>The minimum passing mark for the CIE is 50% of the maximum marks (25 marks out of 50).</p> <p><b>Continuous Internal Evaluation:</b> CIE will be conducted by the department and it will have only 01 component:</p> <p><b>I. Theory component.</b> Theory Component will consist of</p> <p>A. Internal Assessment Test B. Formative assessments</p> <p><b>A. Internal Assessment Test:</b></p> <ul style="list-style-type: none"> <li>• There are 03 tests each of 50 marks conducted during 6<sup>th</sup> week, 10<sup>th</sup> week &amp; 15<sup>th</sup> week, respectively.</li> </ul>	<p>The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks).</p> <p><b>Semester-End Examination:</b> Duration of 03 hours and total marks of 100.</p> <ul style="list-style-type: none"> <li>• The question paper will have ten questions. Each question is set for 20 marks.</li> <li>• 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.</li> </ul>	<p>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.</p>

<ul style="list-style-type: none"> <li>• The question paper will have four questions (max of 3 sub questions) from the notified syllabus. Each question is set for 25 marks.</li> <li>• The student have to answer 2 full questions (one from 1<sup>st</sup> &amp; 2<sup>nd</sup> questions and another from 3<sup>rd</sup> &amp; 4<sup>th</sup> question).</li> <li>• 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.</li> </ul> <p><b>B. Formative assessments:</b></p> <ul style="list-style-type: none"> <li>• 02 formative assessments each of 50 marks shall be conducted by the course coordinator based on the dept. planning during random times.</li> <li>• One formative assessment shall be completed before 5<sup>th</sup> week and second shall be completed before 12<sup>th</sup> week.</li> <li>• The syllabus content for the formative assessment shall be defined by the course coordinator.</li> <li>• The formative assessments include Assignments/ Quiz/ seminars/case study/field survey/ report presentation/ course project/etc.</li> <li>• The assignment QP or Quiz QP shall indicate marks of each question and the relevant COs &amp; RBT levels.</li> <li>• The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs &amp; POs.</li> </ul> <p><b>The final CIE marks will be 50:</b> Average of all 05 events of Internal Assessment test and formative assessments.</p> <p><b>The documents of all the assessments shall be maintained meticulously.</b></p>	<ul style="list-style-type: none"> <li>• The students have to answer 5 full questions, selecting one full question from each module.</li> <li>• Marks scored shall be proportionally reduced to 50 marks.</li> </ul>	
---	--	--

## 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 6<sup>th</sup> week, 10<sup>th</sup> week & 15<sup>th</sup> 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 1<sup>st</sup> & 2<sup>nd</sup> questions and another from 3<sup>rd</sup> & 4<sup>th</sup> 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 14<sup>th</sup> 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
<b>TOTAL</b>	<b>100</b>	<b>50</b>	<b>50</b>

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.

<ul style="list-style-type: none"> <li>At least one Test covering all the modules is to be conducted for 100 marks during 14<sup>th</sup> week and the same is to be scaled down to <b>25 Marks</b>.</li> <li>Assignments = <b>10 Marks from each module. (50 marks scaled down to 25 Marks)</b></li> <li>The final CIE 50 marks = Test (25 marks) + Assignment (25 marks).</li> </ul>	<b>From Module</b>		<b>Marks Allotted</b>	
	Module 01 (Choice between Lines or Planes)		30	
	Module 02 (Compulsory question)		40	
	Module 03 or Module 04 or Module 05		30	
	<b>TOTAL</b>		<b>100</b>	
	<b>Q. No.</b>	<b>Manual Sketching</b>	<b>Computer display and print out</b>	<b>TOTAL MARKS</b>
	1	15	15	30
2	20	20	40	
3	15	15	30	
<b>TOT.</b>	<b>50</b>	<b>50</b>	<b>100</b>	

#### 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.

<p><b>The documents of all the assessments shall be maintained meticulously.</b></p>	<p>requirement evaluation rubrics shall be decided jointly by examiners.</p> <ul style="list-style-type: none"> <li>• Students can pick one question (experiment/program) from the questions lot prepared by the internal /external examiners jointly.</li> <li>• Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.</li> <li>• General rubrics suggested for SEE: writeup-20%, Conduction procedure and results -60%, Viva-voce 20% of maximum marks.</li> <li>• Change of experiment is allowed only once and shall be assessed only for 85% of the maximum marks.</li> </ul>	
--	--	--

### 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%.

<p>The minimum passing mark for the CIE is 50% of the maximum marks (25 marks out of 50).</p> <p><b>Continuous Internal Evaluation:</b> CIE will be conducted by the department and will have only 01 component:</p> <p><b>I. Theory component.</b> Theory Component will consist of</p> <ol style="list-style-type: none"> <li>A. Internal Assessment Test</li> <li>B. Formative assessments</li> </ol> <p><b>A. Internal Assessment Test:</b></p> <ul style="list-style-type: none"> <li>• There are 02 tests each of 50 marks conducted during 6<sup>th</sup> week &amp; 15<sup>th</sup> week, respectively.</li> <li>• The question paper will be of Multiple-Choice Questions (MCQ).</li> <li>• The student have to answer all questions.</li> <li>• 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</li> </ul>	<p>The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks).</p> <p><b>Semester-End Examination:</b> Theory SEE will be conducted by COE as per the scheduled timetable for duration of 02 hours and total marks of 50.</p> <ul style="list-style-type: none"> <li>• Multiple choice Question paper.</li> <li>• The students have to answer all questions.</li> </ul>	<p>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.</p>
---	--	---



<p><b>B. Formative assessments:</b></p> <ul style="list-style-type: none"> <li>• 01 formative assessments of 50 marks shall be conducted by the Course coordinator based on the dept. planning before 14<sup>th</sup> week.</li> <li>• The formative assessments include Assignments/seminars/case study/field survey/ report presentation/course project/etc.</li> <li>• The assignment QP shall indicate marks of each question and the relevant COs &amp; RBT levels.</li> <li>• The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs &amp; POs.</li> </ul> <p><b>The final CIE marks will be 50:</b> Average of all 03 events (02 Internal Assessment test and 01 formative assessment).</p> <p><b>The documents of all the assessments shall be maintained meticulously.</b></p>		
<p><b>6. HSMC: (01 credit course)</b></p>		
<p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%.</p>		
<p>The minimum passing mark for the CIE is 50% of the maximum marks (25 marks out of 50).</p> <p><b>Continuous Internal Evaluation:</b> CIE will be conducted by the department and will have only 01 component:</p> <p><b>I. Theory component.</b> Theory Component will consist of</p> <ol style="list-style-type: none"> <li>A. Internal Assessment Test</li> <li>B. Formative assessments</li> </ol> <p><b>A. Internal Assessment Test:</b></p> <ul style="list-style-type: none"> <li>• There are 02 tests each of 50 marks conducted during 6<sup>th</sup> week &amp; 15<sup>th</sup> week, respectively.</li> <li>• The question paper will be of Multiple-Choice Questions (MCQ).</li> <li>• The student have to answer all questions.</li> </ul>	<p>The minimum passing mark for SEE is 40% of the maximum marks (20 out of 50 marks).</p> <p><b>Semester-End Examination:</b> Theory SEE will be conducted by COE as per the scheduled timetable for duration of 02 hours and total marks of 50.</p> <ul style="list-style-type: none"> <li>• Multiple choice Question paper.</li> <li>• The students have to answer all questions.</li> <li>• Marks scored shall be proportionally reduced to 50 marks.</li> </ul>	<p>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.</p>

<ul style="list-style-type: none"> <li>• 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</li> </ul> <p><b>B. Formative assessments:</b></p> <ul style="list-style-type: none"> <li>• 01 formative assessments of 50 marks shall be conducted by the faculty based on the dept. planning before 14<sup>th</sup> week.</li> <li>• The formative assessments include Assignments/seminars/case study/field survey/ report presentation/course project/etc.</li> <li>• The assignment QP shall indicate marks of each question and the relevant COs &amp; RBT levels.</li> <li>• The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs &amp; POs.</li> </ul> <p><b>The final CIE marks will be 50:</b> Average of all 03 events (02 IA test and 01 formative assessment). <b>The documents of all the assessments shall be maintained meticulously.</b></p>		
<b>7. HSMC: (0 credit courses)</b>		
The weightage is only for Continuous Internal Evaluation (CIE).		
<p>The minimum passing mark for the CIE is 50% of the maximum marks (25 marks out of 50).</p> <p><b>Continuous Internal Evaluation:</b> CIE will be conducted by the department and it will have only 01 component:</p> <p><b>I. Theory component.</b> Theory Component will consist of C. Internal Assessment Test D. Formative assessments</p> <p><b>A. Internal Assessment Test:</b></p> <ul style="list-style-type: none"> <li>• There are 02 tests each of 50 marks conducted during 6<sup>th</sup> week &amp; 15<sup>th</sup> week, respectively.</li> <li>• The question paper will be of Multiple-Choice Questions (MCQ).</li> <li>• The student have to answer all questions.</li> </ul>	<ul style="list-style-type: none"> <li>• No Semester End Examination.</li> </ul>	<p>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.</p>

<ul style="list-style-type: none"> <li>• 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</li> </ul> <p><b>B. Formative assessments:</b></p> <ul style="list-style-type: none"> <li>• 01 formative assessments of 50 marks shall be conducted by the faculty based on the dept. planning during random times.</li> <li>• The formative assessments include Assignments/seminars/case study/field survey/ report presentation/course project/etc.</li> <li>• The assignment QP shall indicate marks of each question and the relevant COs &amp; RBT levels.</li> <li>• The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs &amp; POs.</li> </ul> <p><b>The final CIE marks will be 50 = Average of all 03 events (02 IA test and 01 formative assessment).</b></p> <p><b>The documents of all the assessments shall be maintained meticulously.</b></p>		
<b>8. NCMC: (0 credit course)</b>		
<p>The weightage is only for Continuous Internal Evaluation (CIE).</p>		
<p>The minimum passing mark for the CIE is 50% of the maximum marks (25 marks out of 50).</p> <p><b>Continuous Internal Evaluation:</b> CIE will be conducted by the department and it will have only 01 component:</p> <p><b>I. Theory component.</b> Theory Component will consist of only 01 assessment</p> <p>A. Internal Assessment Test (not required for NCMC course). B. Formative assessments.</p> <p><b>B. Formative assessments:</b></p> <ul style="list-style-type: none"> <li>• 01 formative assessments of 50 marks shall be conducted by the faculty based on the dept. planning during random times.</li> <li>• The formative assessments include Quiz/Assignments/seminars/case study/field survey/ report presentation/course project/etc.</li> <li>• The assignment QP shall indicate marks of each question and the relevant COs &amp; RBT levels.</li> </ul>	<ul style="list-style-type: none"> <li>• No Semester End Examination.</li> </ul>	<p>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.</p>

<ul style="list-style-type: none"><li>• The rubrics required for the other formal assessments shall be defined by the departments along with mapping of relevant COs &amp; POs.</li></ul> <p><b>The final CIE marks will be 50</b></p> <p><b>The documents of all the assessments shall be maintained meticulously.</b></p>		
---	--	--



|| 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)



## 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 ||  
Sri Adichunchanagiri Shikshana Trust ®

# SJB Institute of Technology

BGS Health and Education City,  
Dr. Vishnuvardhan Road, kengeri,  
Bengaluru – 560060



+91-80-28612445 / 46



<https://sjbit.edu.in/>



Approved by AICTE, New Delhi



Affiliated to  
Visvesvaraya Technological University, Belagavi



Accredited by NBA



Accredited by NAAC with A+



Recognized by UGC, New Delhi with 2(f) and 12(B)



Certified by ISO 9001 – 2015



ARIIA

ATAL Ranking:  
Band Performer



Band of 151 to 300 in  
Innovation Category