

**Visvesvaraya Technological University, Belagavi**  
**Scheme of Teaching and Examinations-2022**  
**Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2022-23)**

<b>Semester (Electrical &amp; Electronics Engineering Stream)</b>												
<b>(For Physics Group)</b>												
Sl. No	Course and Course Code	Course Title	TD/PSB	Teaching Hours/Week					Examination			
				Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	Credits
1	*ASC(IC) • BMATE101	Mathematics-I for EEE Streams	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC) • BPHYE102	Applied Physics for EEE Stream	PHY	2	2	2	0	03	50	50	100	04
3	ESC BEEE103	# Elements of Electrical Engineering	EEE/ECE/TCE	2	2	0	0	03	50	50	100	03
4	ESC-I BESCK104x	## Basic Electronics for EEE stream Engineering Science Course-I	Respective Engg Dept	3	0	0	0	03	50	50	100	03
5	ETC-I BETCK105x	Emerging Technology Course-I	Any Dept	3	0	0	0	03	50	50	100	03
	PLC-I BPLCK105x	Programming Language Course-I	Any Dept	2	0	2	0	03				
6	AEC • BENGK106	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMC BPWSK106	Professional Writing Skills in English	Humanities	1	0	0	0	01	50	50	100	01
	BKSKK107/ BKBK107	Sanskritika Kannada/ Balake	Humanities	1	0	0	0	01	50	50	100	01
	BICOK107	Indiar Constitution	Humanities	1	0	0	0	01				
	BIDTK158	Inf , and Design Thinking	Any Dept	1	0		0	01	50	50		
	BSFHK158	undations of Health	Any Dept	1	0			01				







shall be designed as an Integrated course (L:T:P:S= 2:0:2:0 ). All 01 Credit- courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ

(ESC-I) Engineering Science Courses-I					(ETC-I) Emerging Technology Courses-I				
Code	Title	L	T	P	Code	Title	L	T	P
BESCK104A	Introduction to Civil Engineering	3	0	0	BETCK105A	Smart Materials and Systems	3	0	0
BESCK104B	Introduction to Electrical Engineering	3	0	0	BETCK105B	Green Buildings	3	0	0
BESCK104C	Introduction to Electronics	3	0	0	BETCK105C	Introduction to Nano Technology	3	0	0
<b>Communication</b>									
BESCK104D	Introduction to Mechanical Engineering	3	0	0	BETCK105D	Introduction to Sustainable Engineering	3	0	0
BESCK104E	Introduction to C Programming	2	0	2	BETCK105E	Renewable Energy Sources	3	0	0
					BETCK105F	Waste Management	3	0	0
					BETCK105G	Emerging Applications of Biosensors	3	0	0
					BETCK105H	Introduction to Internet of Things (IoT)	3	0	0
					BETCK105I	Introduction to Cyber Security	3	0	0
					BETCK105J	Introduction to Embedded System	3	0	0
<b>(PLC-I) Programming Language Courses-I</b>									
Code	Title	L	T	P					
BPLCK105A	Introduction to Web Programming	2	0	2					
BPLCK105B	Introduction to Python Programming	2	0	2					
BPLCK105C	Basics of JAVA programming	2	0	2					
BPLCK105D	Introduction to C++ Programming	2	0	2					
<b>The course BESCK104E, Introduction to C Programming, and all courses under PLC and ETC groups can be taught by faculty of ANY DEPARTMENT</b>									

- The student has to select one course from the ESC-I group.
- EEE Students shall opt for any one of the courses from the ESC-I group except, BESCK104B-Introduction to Electrical Engineering and ECE/ETC/BM/ML students shall opt any one of the courses from ESC-I except BESCK104C Introduction to Electronics Engineering
- The students have to opt for the courses from ESC group without repeating the course in either 1<sup>st</sup> or 2<sup>nd</sup> semester
- The students must select one course from either ETC-I or PLC-I group.
- If students study the subject from ETC-I in 1<sup>st</sup> semester he/she has to select the course from PLC-II in the 2<sup>nd</sup> semester and vice-versa



**Visvesvaraya Technological University, Belagavi**  
**Scheme of Teaching and Examinations-2022**  
**Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2022-23)**

**II Semester (Electrical & Electronics Engineering Stream)****(For the students who attended 1<sup>st</sup> semester under Physics Group)**

Sl. No	Course and Course Code	Course Title	TD/PSB	Teaching Hours/Week				Examination				Credits				
				Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration In hours	CIE Marks	SEE Marks	Total Marks					
1	*ASC(IC)	BMATE201	Mathematics-II for EESI	2	2	2	0	03	50	50	100	04				
2	#ASC(IC)	BCHEE202	Chemistry for EES	2	2	2	0	03	50	50	100	04				
3	ESC	BCEDK203	Computer-Aided Engineering Drawing	2	0	2	0	03	50	50	100	03				
4	ESC-II	BESCK204x	Engineering Science Course-II	3	0	0	0	03	50	50	100	03				
5	PLC-II	BPLCK205x	Programming Language Course-II	2	0	2	0	03	50	50	100	03				
	ETC-II	BETCK205x	Emerging Technology Course-II	03	0	0	0	03	50	50	100	01				
6	AEC	BENGK206	Communicative English	1	0	0	0	01	50	50	100	01				
7	HSMS	BICOK207	Indian Constitution	1	0	0	0	01	50	50	100	01				
	HSMS	BKSCK207/ BKBBK207	Samskrutika Kannada/ Balake Kannada	1	0	0	0	01	50	50	100	01				
8	HSMS	BSFHK258	Scientific Foundations of Health	1	0	0	0	01	50	50	100	01				
				TOTAL				1	0	0	0	01	400	400	800	20



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

\*. BMATE201 shall have the 03 hours of theory examination(SEE), however, practical sessions question shall be included in the theory question papers. \*\* The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.

#- BCHEE202- SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination

ESC or ETC of 03 credits Courses shall have only a theory component (L:T:P:S=3:0:0:0) or if the nature the of course required practical learning, syllabus shall be designed as an Integrated course (L:T:P:S= 2:0:2:0)

All 01 Credit- courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ

(ESC-II) Engineering Science Courses-II					(ETC-II) Emerging Technology Courses-II				
Code	Title	L	T	P	Code	Title	L	T	P
BESCK201A	Introduction to Civil Engineering	3	0	0	BETCK205A	Smart materials and Systems	3	0	0
BESCK202B	Introduction to Electrical Engineering	3	0	0	BETCK205B	Green Buildings	3	0	0
BESCK203C	Introduction to Electronics	3	0	0	BETCK205C	Introduction to Nano Technology	3	0	0
<b>Communication</b>									
BESCK204D	Introduction to Mechanical Engineering	3	0	0	BETCK205D	Introduction to Sustainable Engineering	3	0	0
BESCK205E	Introduction to C Programming	2	0	2	BETCK205E	Renewable Energy Sources	3	0	0
					BETCK205F	Waste Management	3	0	0
					BETCK205G	Emerging Applications of Biosensors	3	0	0
					BETCK205H	Introduction to Internet of Things(IoT)	3	0	0
					BETCK205I	Introduction to Cyber Security	3	0	0
					BETCK205J	Introduction to Embedded System	3	0	0
<b>(PLC-II) Programming Language Courses-II</b>									
Code	Title	L	T	P					
BPLCK205A	Introduction to Web Programming	2	0	2					
BPLCK205B	Introduction to Python Programming	2	0	2					
BPLCK205C	Basics of JAVA programming	2	0	2					
BPLCK205D	Introduction to C++ Programming	2	0	2					
The course BESCK205E, Introduction to C Programming, and all courses under PLC and ETC groups can be taught by faculty of ANY DEPARTMENT									



- The student has to select one course from the ESC-II group.
- EEE Students shall opt for any one of the courses from the ESC-I group except, BESCK202-Introduction to Electrical Engineering and ECE/ETC/BM/ML students shall opt any one of the courses from ESC-I except BESCK203Introduction to Electronics Engineering
- The students have to opt for the courses from ESC group without repeating the course in either 1<sup>st</sup> or 2<sup>nd</sup> semester
- The students must select one course from either ETC-II or PLC-II group.
- If students study the subject from ETC-I in 1<sup>st</sup> semester he/she has to select the course from PLC-II in the 2<sup>nd</sup> semester and vice-versa



**Visvesvaraya Technological University, Belagavi**  
**Scheme of Teaching and Examinations-2022**  
**Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2022-23)**

I Semester (Electrical & Electronics Engineering Stream)										(For Chemistry Group)				
Sl. No	Course and Course Code	Course Title	TD/PSB	Teaching Hours/Week				Examination				Credits		
				Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration In hours	CIE Marks	SEE Marks	Total Marks			
1	*ASC(IC)	BMATE101 Mathematics-I for EES	Maths	2	2	2	0	03	50	50	100	04		
2	#ASC(IC)	BCHEE102 Chemistry for EES	Chemistry	2	2	2	0	03	50	50	100	04		
3	ESC	BCEDK103 Computer-Aided Engineering Drawing	Mechanical	2	0	2	0	03	50	50	100	03		
4	ESC-I	BESCK104x Engineering Science Course-I	Respective Engg Dept	3	0	0	0	03	50	50	100	03		
5	ETC-I	BETCK105x Emerging Technology Course-I	Any Dept	3	0	0	0	03	50	50	100	03		
	OR													
	PLC-I	BPLCK105x Programming Language Course-I		2	0	2	0	03						
6	AEC	BPWSK106 Professional Writing Skills in English	Humanities	1	0	0	0	01	50	50	100	01		
		OR												
		BENGK106 Communicative English												
		BICOK107 Indian Constitution												
7	HSMS	BKSKK107/ BKBKK107 Samskrutika Kannada/ Balake Kannada	Humanities	1	0	0	0	01	50	50	100	01		
		OR												
		BSFHK158 Scientific Foundations of Health		1	0	0	0	01	50	50	100	01		
		OR												
8	HSMS	BIDTK158 Innovation and Design Thinking	Any Dept.	1	0	0	0	01	50	50	100	01		
		OR												
		TOTAL												



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

\*- BMATE101 Shall have the 03 hours of theory examination (SEE), however, practical sessions question shall be included in the theory question papers. \*\* The mathematics subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.

#- BCHEE102- SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination

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

**Credit Definition:**

1-hour Lecture (L) per week=1Credit

2-hour Tutorial(T) per week=1Credit

2-hours Practical / Drawing (P) per week=1Credit

2-hours Skill Development Actives (SDA) per week = 1 Credit

04-Credits courses are to be designed for 50 hours of Teaching-Learning Session  
04-Credits (IC) are to be designed for 40 hours' theory and 12-14 hours of practical sessions  
03-Credits courses are to be designed for 40 hours of Teaching-Learning Session  
02- Credits courses are to be designed for 25 hours of Teaching-Learning Session  
01-Credit courses are to be designed for 12-15 hours of Teaching-Learning sessions

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

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



(ESC-I) Engineering Science Courses-I						(ETC-I) Emerging Technology Courses-I					
Code	Title	L	T	P	Code	Title	L	T	P		
BESCK104A	Introduction to Civil Engineering	3	0	0	BETCK105A	Smart Materials and Systems	3	0	0		
BESCK104B	Introduction to Electrical Engineering	3	0	0	BETCK105B	Green Buildings	3	0	0		
BESCK104C	Introduction to Electronics	3	0	0	BETCK105C	Introduction to Nano Technology	3	0	0		
	<b>Communication</b>										
BESCK104D	Introduction to Mechanical Engineering	3	0	0	BETCK105D	Introduction to Sustainable Engineering	3	0	0		
BESCK104E	Introduction to C Programming	2	0	2	BETCK105E	Renewable Energy Sources	3	0	0		
					BETCK105F	Waste Management	3	0	0		
					BETCK105G	Emerging Applications of Biosensors	3	0	0		
					BETCK105H	Introduction to Internet of Things (IoT)	3	0	0		
					BETCK105I	Introduction to Cyber Security	3	0	0		
					BETCK105J	Introduction to Embedded System	3	0	0		
(PLC-I) Programming Language Courses-I											
Code	Title	L	T	P							
BPLCK105A	Introduction to Web Programming	2	0	2							
BPLCK105B	Introduction to Python Programming	2	0	2							
BPLCK105C	Basics of JAVA programming	2	0	2							
BPLCK105D	Introduction to C++ Programming	2	0	2							
<b>The course BESCK104EIntroduction to C Programming, and all courses under PLC and ETC groups can be taught by faculty of ANY DEPARTMENT</b>											

- The student has to select one course from the ESC-I group.
- EEE Students shall opt for any one of the courses from the ESC-I group except, BESCK104B-Introduction to Electrical Engineering and ECE/ETC/BM/ML students shall opt any one of the courses from ESC-I except BESCK104C Introduction to Electronics Engineering
- The students have to opt for the courses from ESC group without repeating the course in either 1<sup>st</sup> or 2<sup>nd</sup> semester
- The students must select one course from either ETC-I or PLC-I group.
- If students study the subject from ETC-I in 1<sup>st</sup> semester he/she has to select the course from PLC-II in the 2<sup>nd</sup> semester and vice-versa



**Visvesvaraya Technological University, Belagavi**  
**Scheme of Teaching and Examinations-2022**  
**Outcome-Based Education (OBE) and Choice Based Credit System (CBCS)**  
**(Effective from the academic year 2022-23)**

**II Semester (Electrical & Electronics Engineering Stream)**

(For students who attended 1<sup>st</sup> semester under Chemistry Group)

Sl. No	Course and Course Code	Course Title	TD/PSB	Teaching Hours/Week					Examination				Credits				
				Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks						
												L		T	P	S	
1	*ASC(IC)	BMATE201	Mathematics-II for EES	2	2	2	0	03	50	50	100	04					
2	#ASC(IC)	BPHYE202	Applied Physics for EES	2	2	2	0	03	50	50	100	04					
3	ESC	BEEE203	# Elements of Electrical Engineering	2	2	0	0	03	50	50	100	03					
		OR	## Basic Electronics	2	2	0	0										
				BEEE203	3	0	0						0				
4	ESC-II	BESCK204x	Engineering Science Course-II	3	0	0	0	03	50	50	100	03					
5	PLC-II	BPLCK205x	Programming language Course-II	2	0	2	0	03	50	50	100	03					
	OR	Emerging Technology Course-II	2														
			ETC-II	BETCK205x	3	0	0	0					03				
6	AEC	BENGK206	Communicative English	1	0	0	0	01	50	50	100	01					
		OR	Professional Writing Skills in English	1	0	0	0	01	50	50	100	01					
				BPWSK206	3	0	0	0	03	50	50	100	03				
7	HSMC	BKSKK207/ BKBKK207	Samskrutika Kannada/ Balake Kannada	1	0	0	0	01	50	50	100	01					
		OR	Indian Constitution	1	0	0	0	01	50	50	100	01					
				BIDTK258	Innovation and Design Thinking	1	0	0	0	01	50	50	100	01			
8	AEC/SDC	BSFHK258	Scientific Foundations of Health	Any Dept	1	0	0	0	01	50	50	100	01				
					OR				1	0	0	0	01	50	50	100	01
					TOTAL				1	0	0	0	01	400	400	800	20

# Electrical & Electronics Engineering Students have to study BEEE203 Elements of Electrical Engineering compulsorily

## Whereas Electronics and allied stream students have to study BEEE203 Basic Electronics compulsorily

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

\*- BMATE201 Shall have the 03 hours of theory examination(SEE), however, practical sessions question shall be included in the theory question papers. \*\* The mathematics

subject should be taught by a single faculty member per division, with no sharing of the course(subject)module-wise by different faculty members.

# - BPHYE202SEE shall have the 03 hours of theory examination and 02-03 hours of practical examination.  
ESC or ETC of 03 credits Courses shall have only a theory component (L:T :P:S=3:0:0:0) or if the nature the of course required practical learning syllabus shall be MCQ designed as an Integrated course (L:T:P:S= 2:0:2:0 ), All 01 Credit- courses shall have the SEE of 01 hours duration and the pattern of the question paper shall be MCQ



(ESC-II) Engineering Science Courses-II						(ETC-II) Emerging Technology Courses-II					
Code	Title	L	T	P	Code	Title	L	T	P		
BESCK204A	Introduction to Civil Engineering	3	0	0	BETCK205A	Smart materials and Systems	3	0	0		
BESCK204B	Introduction to Electrical Engineering	3	0	0	BETCK205B	Green Buildings	3	0	0		
BESCK204C	Introduction to Electronics <b>Communication</b>	3	0	0	BETCK205C	Introduction to Nano Technology	3	0	0		
BESCK204D	Introduction to Mechanical Engineering	3	0	0	BETCK205D	Introduction to Sustainable Engineering	3	0	0		
BESCK204E	Introduction to C Programming	2	0	2	BETCK205E	Renewable Energy Sources	3	0	0		
					BETCK205F	Waste Management	3	0	0		
					BETCK205G	Emerging Applications of Biosensors	3	0	0		
					BETCK205H	Introduction to Internet of Things (IoT)	3	0	0		
					BETCK205I	Introduction to Cyber Security	3	0	0		
					BETCK205J	Introduction to Embedded System	3	0	0		
<b>(PLC-II) Programming Language Courses-II</b>											
Code	Title	L	T	P							
BPLCK205A	Introduction to Web Programming	2	0	2							
BPLCK205B	Introduction to Python Programming	2	0	2							
BPLCK205C	Basics of JAVA programming	2	0	2							
BPLCK205D	Introduction to C++ Programming	2	0	2							
<b>The course BESCK204E, Introduction to C Programming, and all courses under PLC and ETC groups can be taught by faculty of ANY DEPARTMENT</b>											

- The student has to select one course from the ESC-II group.
- EEE Students shall opt for any one of the courses from the ESC-I group except, BESCK204B-Introduction to Electrical Engineering and ECE/ETC/BM/ML students shall opt any one of the courses from ESC-I except BESCK204C-Introduction to Electronics Engineering
- The students have to opt for the courses from ESC group without repeating the course in either 1<sup>st</sup> or 2<sup>nd</sup> semester
- The students must select one course from either ETC-II or PLC-II group.
- If students study the subject from ETC-I in 1<sup>st</sup> semester he/she has to select the course from PLC-II in the 2<sup>nd</sup> semester and vice-versa

Course Title:	Computer Aided Engineering Drawing (Common to All)		
Course Code	BCEDK203/203	CIE Marks	50
Teaching Hour/Week (L:T:P:S)	2:0:2:0	SEE Marks	50
Total Hours of Teaching - Learning	40	Total Marks	100
Credits	03	Exam Hours	03

**Course Learning Objectives:**

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

**Teaching-Learning (General Instructions):**

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

**Module-1****Introduction: for CIE only**

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

**Orthographic Projections of Points, Lines and Planes:**

Introduction to Orthographic projections: Orthographic projections of points in 1<sup>st</sup> and 3<sup>rd</sup> quadrants.

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

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

**Application on projections of Lines & Planes (For CIE only)****Module-2****Orthographic Projection of Solids:**

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

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



### Module-3

#### **Isometric Projections:**

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

#### **Conversion of simple isometric drawings into orthographic views.**

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

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

### Module-4

#### **Development of Lateral Surfaces of Solids:**

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

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

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

### Module-5

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

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

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

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

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

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

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

#### **Course Outcomes**

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

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

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

**CO 3.** Develop the lateral surfaces of the object

**CO 4.** Create a Drawing views using CAD software.

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

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

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

#### Continuous Internal Evaluation (CIE)

- CIE shall be evaluated for max. marks of 100 and later the same shall be scaled-down to 50 marks as detailed below:
- 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	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Sketching (b)
Module 1	15	10	05
Module 2	20	15	05
Module 3	20	20	00
Module 4	20	20	00
Module 5	25	15	10
<b>Total</b>	<b>100</b>	<b>80</b>	<b>20</b>
<b>Consideration of Class work</b>		<b>Total of [(a) + (b)] = 100 Scaled down to 30 Marks</b>	

- At least one Test covering all the modules is to be conducted for 100 marks and evaluation to be based SEE pattern, and the same is to be scaled down to 20 Marks.
- The final CIE = Class work marks + Test marks

#### Semester End Examination (SEE)

- SEE shall be conducted and evaluated for maximum marks 100. Marks obtained shall be accounted for SEE final marks, reducing it by 50%.
- Question paper shall be set jointly by both Internal and External Examiner and made available for each batch as per schedule. *Questions are to be set preferably from TextBooks.*
- Related to Module-1:** One full question can be set either from “points & lines” or “planes”.
- Evaluation shall be carried jointly by both the examiners.
- Scheme of Evaluation: *To be defined by the examiners jointly and the same shall be submitted to the university along with question paper.*
- One full question shall be set from each of the Module from Modules 1,2,3 and 4 as per the below tabled weightage details. However, the student may be awarded full marks, if he/she completes solution on computer display without sketch.



Module	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Preparatory sketching (b)
Module 1	20	15	05
Module 2	30	25	05
Module 3	25	20	05
Module 4	25	20	05
<b>Total</b>	<b>100</b>	<b>80</b>	<b>20</b>
<b>Consideration of SEE Marks</b>		<b>Total of (a) + (b) ÷ 2 = Final SEE marks</b>	

### Suggested Learning Resources:

#### Text Books

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

#### Reference Books

- Bhattacharya S. K., Electrical Engineering Drawing, New Age International publishers, second edition 1998, reprint2005.
- Chris Schroder, Printed Circuit Board Design using AutoCAD, Newnes,1997.
- K S Sai Ram Design of steel structures, , Third Edition byPearson
- Nainan p kurian Design of foundation systems, Narosapublications
- A S Pabla, Electrical power distribution, 6th edition, Tata Mcgrawhill
- Bhatt, N.D., Engineering Drawing: Plane and Solid Geometry, 53<sup>rd</sup> edition, Charotar Publishing House Pvt. Limited, 2019.
- K. R. Gopalakrishna, & Sudhir Gopalakrishna: Textbook Of Computer Aided Engineering Drawing, 39<sup>th</sup> Edition, Subash Stores, Bangalore,2017

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

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

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

## Electrical & Electronics Engineering and Allied branches(Chemistry group)

<b>CourseTitle:</b>	<b>Chemistry for Electrical and Electronics Engineering stream</b>		
<b>CourseCode:</b>	<b>BCHEE202/202</b>	<b>CIEMarks</b>	<b>50</b>
<b>Course Type(Theory/Practical/Integrated)</b>	<b>Integrated</b>	<b>SEEMarks</b>	<b>50</b>
		<b>Total Marks</b>	<b>100</b>
<b>TeachingHours/Week(L:T:P:S)<sup>1</sup></b>	<b>2:2:2:0</b>	<b>Exam Hours</b>	<b>03</b>
<b>TotalHoursofPedagogy</b>	<b>40hoursTheory+10to 12Lab slots</b>	<b>Credits</b>	<b>04</b>
<b>Courseobjectives</b> <ul style="list-style-type: none"> <li>Toenablestudentstoacquireknowledgeonprinciplesofchemistryforengineeringapplications.</li> <li>Todevelopanintuitiveunderstandingofchemistrybyemphasizingtherelatedbranchesofengineering.</li> <li>Toprovidestudentswithasolidfoundationinanalyticalreasoningrequiredtosolvesocietal problems.</li> </ul>			
<b>Teaching-LearningProcess</b> Thesearesamplestrategies,whichteachercanusetoacceleratetheattainmentofthevariouscours eoutcomesandmakeTeaching-Learningmoreeffective <ul style="list-style-type: none"> <li>Tutorial&amp;remedialclassesforneedystudents(notregularT/R)</li> <li>ConductingMakeupclasses/Bridgecoursesforneedystudents</li> <li>Demonstrationofconceptseitherbybuildingmodelsorbyindustryvisit</li> <li>Experimentsinlaboratoriesshallbeexecutedinblendedmode(conventionalornon-conventionalmethods)</li> <li>UseofICT-Onlinevideos,onlinecourses</li> <li>Useofonlineplatformsforassignments/Notes/Quizzes(Ex.Googleclassroom)</li> </ul>			
<b>MODULE1:ChemistryofElectronicMaterials(8hr)</b>			
<b>ConductorsandInsulators:</b> Introduction,principlewithexamples. <b>Semiconductors:</b> Introduction, production of electronic grade silicon-Czochralski process(CZ) andFloatZone(FZ)methods. <b>Polymers:</b> Introduction,Molecularweight-Numberaverage,Weightaverageandnumericalproblems.Conductingpolymers-synthesisandconductingmechanismofpolyacetylene.Preparation, propertiesandcommercialapplicationsofgrapheneoxide. <b>PCB:</b> Electroless plating – Introduction, Electroless plating of copper in the manufacture ofdouble-sidedPCB. <b>Self-learning:</b> Technologicalimportanceofmetalfinishinganddistinctionbetween electroplatingandelectrolessplating.			
<b>MODULE2:EnergyConversionandStorage(8hr)</b>			
<b>Batteries:</b> Introduction, classification of batteries. Components, construction, working andapplications of modern batteries; Na-ion battery, solid state battery (Li-polymer battery)andflowbattery(Vanadiumredoxflowbattery). <b>FuelCells:</b> Introduction,construction,workingandapplicationsofmethanol-oxygenand			

1.NOTE:Whereverthecontact hoursisnotsufficient,tutorialhourcanbeconvertedto theoryhours



polymerelectrolytemembrane(PEM)fuelcell.

**SolarEnergy:**Introduction,importanceofsolarPVcell,constructionandworkingofsolarPVcell,advantagesanddisadvantages.

**Self-learning:**Electrodesforelectrostaticdoublelayercapacitors,pseudocapacitors,and hybridcapacitor.

### **MODULE3:CorrosionScienceandE-wasteManagement(8hr)**

**CorrosionChemistry:**Introduction,electrochemicaltheoryofcorrosion,typesofcorrosion-differentialmetalanddifferentialaeration.Corrosioncontrol-galvanization,anodization and sacrificial anode method. Corrosion Penetration Rate (CPR) - Introductionandnumerical problem.

**E-waste Management:** Introduction, sources, types, effects of e-waste on environment andhuman health, methods of disposal, advantages of recycling. Extraction of copper and goldfrome-waste.

**Self-learning:**RecyclingofPCBandbatterycomponents

### **MODULE4:NanomaterialsandDisplaySystems(8hr)**

**Nanomaterials:** Introduction, size dependent properties of nanomaterials (Surface area,Catalytic, Conducting), preparation of nanomaterials by sol-gel and co-precipitation methodwithexample.Introduction,propertiesandapplications- Nanofibers,Nanophotonics,Nanosensors.

**DisplaySystems:**Liquidcrystals(LC's)-Introduction,classification,propertiesandapplication in Liquid Crystal Displays (LCD's). Properties and application of Organic LightEmittingDiodes(OLED's)andQuantumLightemittingdiodes(QLED's).

**PerovskiteMaterials:**Introduction,propertiesandapplicationsinoptoelectronicdevices.

**Self-learning:**Properties&electrochemicalapplicationsofcarbonnanotubesandgraphene.

### **MODULE5:SensorsinAnalyticalTechniques(8hr)**

**Electrode System:** Introduction, types of electrodes. Ion selective electrode - definition,construction, working and applications of glass electrode. Determination of pH using glasselectrode. Reference electrode- Introduction, calomel electrode- construction, workingand applicationsof calomelectrode.Concentrationcell- Definition,constructionandNumericalproblems.

**Sensors:**Introduction,workingprincipleandapplicationsofConductometricsensors,Electrochemicalsensors, Thermometricsensors, andOpticalsensors.

**AnalyticalTechniques:**Introduction,principleandinstrumentationofColorimetricsensors; its application in the estimation of copper, principleandinstrumentationof Potentiometric sensors; principleandinstrumentationof its applicationin the estimation of iron, Conductometric sensors; its application in the estimation of weakacid.

**Self-learning:**IRandUV-Visiblespectroscopy.

### **PRACTICALMODULE**

**A-Demonstration(anytwo)offline/virtual:**

A1.Synthesisofpolyurethane

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

batteryA3.Synthesisofironoxidenanoparticles

A4.Electroplatingofcopperonmetallicobjects



**B-Exercise(compulsorilyany4tobeconducted):**

- B1. Conductometric estimation of acid mixture  
 B2. Potentiometric estimation of FAS using  $K_2Cr_2O_7$   
 B3. Determination of  $pK_a$  of vinegar using pH sensor (Glass electrode)  
 B4. Determination of rate of corrosion of mild steel by weight loss method  
 B5. Estimation of total hardness of water by EDTA method

**C-Structured Enquiry (compulsorilyany4tobeconducted):**

- C1. Estimation of Copper present in electroplating effluent by optical sensor (colorimetry)  
 C2. Determination of Viscosity coefficient of lubricant (Ostwald's viscometer)  
 C3. Estimation of iron in TMT bar by diphenyl amine/external indicator method  
 C4. Estimation of Sodium present in soil/effluents sample using flame photometry  
 C5. Determination of Chemical Oxygen Demand (COD) of industrial wastewater sample

**D-Open Ended Experiments (any two):**

- D1. Estimation of metal in e-waste by optical sensors  
 D2. Electroless plating of Nickel on Copper  
 D3. Determination of glucose by electrochemical sensors  
 D4. Synthesis of polyaniline and its conductivity measurement

**Course outcome (Course Skill Set)**

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

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

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

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

**Continuous Internal Evaluation (CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

- On completion of every experiment/program in the laboratory, the students shall be



**B-Exercise(compulsorilyany4tobeconducted):**

- B1. Conductometric estimation of acid mixture  
 B2. Potentiometric estimation of FAS using  $K_2Cr_2O_7$   
 B3. Determination of pKa of vinegar using pH sensor (Glass electrode)  
 B4. Determination of rate of corrosion of mild steel by weight loss method  
 B5. Estimation of total hardness of water by EDTA method

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

- C1. Estimation of Copper present in electroplating effluent by optical sensor (colorimetry)  
 C2. Determination of Viscosity coefficient of lubricant (Ostwald's viscometer)  
 C3. Estimation of iron in TMT bar by diphenyl amine/external indicator method  
 C4. Estimation of Sodium present in soil/effluents sample using flame photometry  
 C5. Determination of Chemical Oxygen Demand (COD) of industrial wastewater sample

**D-Open Ended Experiments (any two):**

- D1. Estimation of metal in e-waste by optical sensors  
 D2. Electroless plating of Nickel on Copper  
 D3. Determination of glucose by electrochemical sensors  
 D4. Synthesis of polyaniline and its conductivity measurement

**Course outcome (Course Skill Set)**

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

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

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

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

**Continuous Internal Evaluation (CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

- On completion of every experiment/program in the laboratory, the students shall be



evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.

- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

#### **Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

#### **Suggested Learning Resources:**

##### **Books(TitleoftheBook/Nameoftheauthor/Nameofthepublisher/EditionandYear)**

1. WileyEngineeringChemistry,WileyIndiaPvt.Ltd.NewDelhi,2013-2<sup>nd</sup>Edition.
2. EngineeringChemistry,Satyaprakash&ManishaAgrawal,KhannaBookPublishing,Delhi
3. ATextBookofEngg.Chemistry,ShashiChawla,DhanpatRai&Co.(P)Ltd.
4. EssentialsofPhysicalChemistry,Bahl & Tuli,S.ChandPublishing
5. AppliedChemistry,SunitaRattan,Kataria5.EngineeringChemistry,Baskar,Wiley
6. EngineeringChemistry-I,D.Grouar Krishana,VikasPublishing
7. ATextbookofEngineeringChemistry,SSDara&Dr.SSUmare,SChand&CompanyLtd.,12<sup>th</sup>Edition,2011
8. ATextBookofEngineeringChemistry,R.V.GadagandNityanandaShetty,I.K.InternationalPublishinghouse. 2<sup>nd</sup>Edition,2016.
9. TextBookofPolymerScience,F.W.Billmeyer,JohnWiley&Sons,4<sup>th</sup>Edition,1999.
10. NanotechnologyAChemicalApproachtoNanomaterials,G.A.Ozin &A.C.Arsenault,RSCPublishing,2005.
11. CorrosionEngineering,M.G.Fontana,N.D.Greene,McGrawHillPublications,NewYork,3<sup>rd</sup>Edition,1996.
12. Linden'sHandbookofBatteries,KirbyW.Beard,FifthEdition,McGrawHill,2019.
13. OLEDDisplayFundamentalsandApplications,TakatoshiTsujiMura,Wiley-Blackwell,2012
14. Supercapacitors: Materials, Systems, and Applications, Max Lu, Francois Beguin,ElzbietaFrackowiak,Wiley-VCH;1st edition,2013.



15. "Handbook on Electroplating with Manufacture of Electrochemicals", ASIAPACIFIC BUSINESS PRESS Inc., 2017. Dr.H. Panda,
16. Expanding the Vision of Sensor Materials. National Research Council 1995, Washington, DC: The National Academies Press. doi:10.17226/4782.
17. Engineering Chemistry, Edited by Dr. Mahesh Band Dr. Roopashree B, Sunstar Publisher, Bengaluru, ISBN 978-93-85155-70-3, 2022
18. High Performance Metallic Materials for Cost Sensitive Applications, F.H. Froes, et al. John Wiley & Sons, 2010
19. Instrumental Methods of Analysis, Dr. K. R. Mahadik and Dr. L. Sathiyarayanan, Nirali Prakashan, 2020
20. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch Seventh Edition, Cengage Learning, 2020
21. Polymer Science, VR Gowariker, NV Viswanathan, Jayadev, Sreedhar, Newage Int. Publishers, 4th Edition, 2021
22. Engineering Chemistry, PC Jain & Monica Jain, Dhanpat Rai Publication, 2015-16<sup>th</sup> Edition.
23. Nanostructured materials and nanotechnology, Hari Singh, Nalwa, academic press, 1<sup>st</sup> Edition, 2002.
24. Nanotechnology Principles and Practices, Sulabha Kulkarni, Capital Publishing Company, 3<sup>rd</sup> Edition 2014
25. Principles of nanotechnology, Phanikumar, Scitech publications, 2<sup>nd</sup> Edition, 2010.
26. Chemistry for Engineering Students, B.S. Jai Prakash, R. Venugopal, Sivakumaraiah & Pushpalyengar, Subash Publications, 5<sup>th</sup> Edition, 2014
27. "Engineering Chemistry", O.G. Palanna, Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint, 2015.
28. Chemistry of Engineering materials, Malini S, KS Anantha Raju, CBS publishers Pvt Ltd.
29. Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

#### Weblinks 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=PLyhmwFtnRhuz8L1bb3X-9lbHrDMjHWWWh>
- <https://www.youtube.com/watch?v=j5Hml6KN4TI>
- <https://www.youtube.com/watch?v=X9GHBdyYcyo>
- <https://www.youtube.com/watch?v=1xWBPZnEjk8>
- <https://www.youtube.com/watch?v=wRAo-M8xBHM>

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

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

*Siddesh*  
H.O.D.  
Dept. Of Electronics & Communication  
Alva's Institute of Engg. & Technology  
MOONBIDRI - 575 004

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

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

Introduction to Electrical Engineering			
Course Code:	BESCK104B	CIE Marks	50
Course Type (Theory/Practical /Integrated )	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03
<b>Course objectives</b> <ul style="list-style-type: none"> <li>To explain the laws used in the analysis of DC and AC circuits.</li> <li>To explain the behavior of circuit elements in single-phase circuits.</li> <li>To explain the construction and operation of transformers, DC generators and motors and induction motors.</li> <li>To introduce concepts of circuit protecting devices and earthing.</li> <li>To explain electric power generation, transmission and distribution, electricity billing, equipment and personal safety measures.</li> </ul>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective <ol style="list-style-type: none"> <li>Chalk and talk</li> <li>Animated/NPTEL videos</li> <li>Cut sections</li> <li>PPTs</li> </ol>			
<b>Module-1 (08 Hrs)</b>			
<b>Introduction:</b> Conventional and non-conventional energy resources; General structure of electrical power systems using single line diagram approach. <b>Power Generation:</b> Hydel, Nuclear, Solar & wind power generation (Block Diagram approach). <b>DC Circuits:</b> Ohm's Law and its limitations. KCL & KVL, series, parallel, series-parallel circuits. Simple Numerical.			
<b>Module-2 (08 Hrs)</b>			
<b>A.C. Fundamentals:</b> Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor. (only definitions) Voltage and current relationship with phasor diagrams in R, L, and C circuits. Concept of Impedance. Analysis of R-L, R-C, R-L-C Series circuits.Active power, reactive power and apparent power. Concept of power factor. (Simple Numerical). <b>Three Phase Circuits:</b> Generation of Three phase AC quantity, advantages and limitations; star and delta connection, relationship between line and phase quantities (excluding proof)			
<b>Module-3(08 Hrs)</b>			
<b>DC Machines:</b> <b>DC Generator:</b> Principle of operation, constructional details, induced emf expression, types of generators.Relation between induced emf and terminal voltage.Simple numerical. <b>DC Motor:</b> Principle of operation, back emf and its significance. Torque equation, types of motors, characteristics and speed control (armature & field)of DC motors(series & shunt only). Applications of DC motors. Simple numerical.			



**Module-4(08 Hrs)**

**Transformers:** Necessity of transformer, principle of operation, Types and construction of single-phase transformers, EMF equation, losses, variation of losses with respect to load. Efficiency and simple numerical.

**Three-phase induction Motors:** Concept of rotating magnetic field, Principle of operation, constructional features of motor, types – squirrel cage and wound rotor. Slip and its significance simple numerical.

**Module-5 (08 Hrs)**

**Domestic Wiring:** Requirements, Types of wiring: casing, capping. Two way and three way control of load.

**Electricity Bill:** Power rating of household appliances including air conditioners, PCs, laptops, printers, etc. Definition of “unit” used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.

**Equipment Safety measures:** Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.

**Personal safety measures:** Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

**Course outcome (Course Skill Set)**

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

CO1	Understand the concepts of various energy sources and Electric circuits.
CO2	Apply the basic Electrical laws to solve circuits.
CO3	Discuss the construction and operation of various Electrical Machines.
CO4	Identify suitable Electrical machine for practical implementation.
CO5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.

### Assessment Details (both CIE and SEE)

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

#### Continuous Internal Evaluation (CIE):

Three Tests each of 20 Marks;

- 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of 40 Marks.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to 50 marks

#### Semester End Examination (SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 03 hours)

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

#### Suggested Learning Resources:

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

##### Text Books:

1. Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.
2. A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

##### Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.
2. Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.
3. Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3<sup>rd</sup> edition, 2014.



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

- [www.nptel.ac.in](http://www.nptel.ac.in)

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

- 

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

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

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

*Siddesh*  
**H.O.D.**  
 Dept. Of Electronics & Communication  
 Jyoti Institute of Engg. & Technology  
 Vijay, MOODHEKOTI - 471-22

Theory - 01 Credit Course

**ಬಳಕೆ ಕನ್ನಡ - baLake Kannada (Kannada for Usage)****ಕನ್ನಡ ಕಲಿಕೆಗಾಗಿ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಪುಸ್ತಕ - (Prescribed Textbook to Learn Kannada)**

Course Title:	ಬಳಕೆ ಕನ್ನಡ		
Course Code:	BKBKK107-207	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

**Course objectives : ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:**

The course (22KBK17/27) will enable the students,

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

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

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

1. ಬಳಕೆ ಕನ್ನಡವನ್ನು ತರಗತಿಯಲ್ಲಿ ಶಿಕ್ಷಕರು ಬೋಧಿಸಲು ವಿಟಿಯು ಸೂಚಿಸಿರುವ ಪಠ್ಯಪುಸ್ತಕವನ್ನು ಉಪಯೋಗಿಸಬೇಕು.
2. ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ತಯಾರಿಸಲು ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ಉತ್ತೇಜಿಸುವುದು ಮತ್ತು ತರಗತಿಯಲ್ಲಿ ಅವುಗಳನ್ನು ಚರ್ಚಿಸಲು ಅವಕಾಶ ಮಾಡಿಕೊಡುವುದು.
3. ಪ್ರತಿ ವಿದ್ಯಾರ್ಥಿ ಪುಸ್ತಕವನ್ನು ತರಗತಿಯಲ್ಲಿ ಬಳಸುವಂತೆ ನೋಡಿಕೊಳ್ಳುವುದು ಮತ್ತು ಪ್ರತಿ ಪಾಠ ಮತ್ತು ಪ್ರವಚನಗಳ ಮೂಲ ಅಂಶಗಳಿಗೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಪೂರಕ ಚಟುವಟಿಕೆಗಳಿಗೆ ತೊಡಗಿಸತಕ್ಕದ್ದು.
4. ಡಿಜಿಟಲ್ ತಂತ್ರಜ್ಞಾನದ ಮುಖಾಂತರ ಇತ್ತೀಚೆಗೆ ಡಿಜಿಟಲೀಕರಣ ಗೊಂಡಿರುವ ಭಾಷೆ ಕಲಿಕೆಯ ವಿಧಾನಗಳನ್ನು ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ಮುಖಾಂತರ ಚರ್ಚಿಸಲು ಕ್ರಮಕೈಗೊಳ್ಳುವುದು. ಇದರಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳನ್ನು ತರಗತಿಯಲ್ಲಿ ಹೆಚ್ಚು ಏಕಾಗ್ರತೆಯಿಂದ ಪಾಠ ಕೇಳಲು ಮತ್ತು ಅಧ್ಯಯನದಲ್ಲಿ ತೊಡಗಲು ಅನುಕೂಲವಾಗುತ್ತದೆ.
5. ಭಾಷಾಕಲಿಕೆಯ ಪ್ರಯೋಗಾಲಯದ ಮುಖಾಂತರ ಬಹುಬೇಗ ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಕಲಿಯಲು ಅನುಕೂಲವಾಗುವಂತೆ ಕಾರ್ಯಚಟುವಟಿಕೆಗಳನ್ನು ಮತ್ತು ಕ್ರಿಯಾ ಯೋಜನೆಗಳನ್ನು ರೂಪಿಸುವುದು.

**Module - 1****(03 hours of pedagogy)**

1. Introduction, Necessity of learning a local language. Methods to learn the Kannada language.
2. Easy learning of a Kannada Language: A few tips. Hints for correct and polite conversation, Listening and Speaking Activities, Key to Transcription
3. ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು - Personal Pronouns, Possessive Forms, Interrogative words



<b>Module - 2</b>	<b>(03 hours of pedagogy)</b>
<ol style="list-style-type: none"> <li>1. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು - Possessive forms of nouns, dubitive question and Relative nouns</li> <li>2. ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and Colour Adjectives, Numerals</li> <li>3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು -ಸಪ್ರಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) -Predictive Forms, Locative Case</li> </ol>	
<b>Module - 3</b>	<b>(03 hours of pedagogy)</b>
<ol style="list-style-type: none"> <li>1. ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು - Dative Cases, and Numerals</li> <li>2. ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು -Ordinal numerals and Plural markers</li> <li>3. ನ್ಯೂನ/ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು &amp; ವರ್ಣ ಗುಣವಾಚಕಗಳು -Defective/Negative Verbs &amp; Colour Adjectives</li> </ol>	
<b>Module- 4</b>	<b>(03 hours of pedagogy)</b>
<ol style="list-style-type: none"> <li>1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತ್ತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು Permission, Commands, encouraging and Urging words (Imperative words and sentences)</li> <li>2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು Accusative Cases and Potential Forms used in General Communication</li> <li>3. "ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು - Helping Verbs "iru and iralla", Corresponding Future and Negation Verbs</li> <li>4. ಹೋಲಿಕೆ (ತರತಮ), ಸಂಬಂಧ ಸೂಚಕ, ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ- Comparative, Relationship, Identification and Negation Words</li> </ol>	
<b>Module - 5</b>	<b>(03 hours of pedagogy)</b>
<ol style="list-style-type: none"> <li>1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು -Different types of Tense, Time and Verbs</li> <li>2. ದ್, -ತ್, - ತು, - ಇತು, - ಆಗಿ, - ಅಲ್ಲ, - ಗ್, -ಕ್, ಇದೆ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ - Formation of Past, Future and Present Tense Sentences with Verb Forms</li> <li>3. Kannada Vocabulary List :ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು -Kannada Words in Conversation</li> </ol>	

### Course outcome (Course Skill Set)

ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಾಂಶಗಳು:

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

C01	To understand the necessity of learning of local language for comfortable life.
C02	To speak, read and write Kannada language as per requirement.
C03	To communicate (converse) in Kannada language in their daily life with kannada speakers.
C04	To Listen and understand the Kannada language properly.
C05	To speak in polite conversation.

### Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than

35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

#### Continuous Internal Evaluation(CIE):

##### Two Unit Tests each of 30 Marks (duration 01 hour)

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

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

##### Two assignments each of 20 Marks

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

The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks

##### Semester End Examinations (SEE)

SEE paper shall be set for 50 questions, each of the 01 mark. The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is 01 hour. The student must secure a minimum of 35% of the maximum marks for SEE.

#### University Prescribed Textbook :

ಬಳಕೆ ಕನ್ನಡ

ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ

ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

#### ಸೂಚನೆ :

1. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.
2. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

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

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



## Theory - 01 Credit Course

**ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ - ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ**

Course Title:	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Course Code:		CIE Marks	50
Course Type (Theory/Practical /Integrated)	BKSKK107-207	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

**Course objectives : ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:**

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

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

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

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

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

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

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

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

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

**ಘಟಕ -3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ (03 hours of pedagogy)**

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

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

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

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

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



**Course outcome (Course Skill Set)**

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ (22KSK17/27) ಪಠ್ಯ ಕಲಿಕೆಯ ನಂತರ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ :

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

C01	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡಿರುತ್ತದೆ.
C02	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ ಮತ್ತು ಜ್ಞಾನಕ್ಕೆ ಸ್ಪೂರ್ತಿ ಮೂಡುತ್ತದೆ.
C03	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಹೆಚ್ಚಾಗುತ್ತದೆ.
C04	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕ ಹೆಚ್ಚಾಗುತ್ತದೆ.
C05	ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

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

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

**Continuous Internal Evaluation(CIE):****Two Unit Tests each of 30 Marks (duration 01 hour)**

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

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

**Two assignments each of 20 Marks**

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

The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks

**Semester End Examinations (SEE)**

SEE paper shall be set for 50 questions, each of the 01 mark. The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is 01 hour. The student must secure a minimum of 35% of the maximum marks for SEE.

**University Prescribed Textbook :****ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ**

ಡಾ. ಹಿ.ಚಿ.ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ,

ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

**ಸೂಚನೆ :**

1. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.
2. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

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

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

Siddesh

Signature of the Head of the Institution  
Date: \_\_\_\_\_  
Place: \_\_\_\_\_



**II Semester**

Course Title:	<b>Mathematics-II for Electrical &amp; Electronics Engineering Stream</b>		
Course Code:	<b>BMATE201</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10 to 12 Lab slots	Credits	04
<b>Course objectives:</b> The goal of the course <b>Mathematics-II for Electrical &amp; Electronics Engineering Stream (22MATE21)</b> is to <ul style="list-style-type: none"> <li>• <b>Familiarize</b> the importance of Vector calculus, Vector Space and Linear transformation for electronics and electrical engineering.</li> <li>• <b>Have an insight</b> into solving ordinary differential equations by using Laplace transform techniques.</li> <li>• <b>Develop</b> the knowledge of solving electronics and electrical engineering problems numerically.</li> </ul>			
<b>Teaching-Learning Process</b> <b>Pedagogy (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. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop students' theoretical and applied mathematical skills.</li> <li>2. State the need for Mathematics with Engineering Studies and Provide real-life examples.</li> <li>3. Support and guide the students for self-study.</li> <li>4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.</li> <li>5. Encourage the students to group learning to improve their creative and analytical skills.</li> <li>6. Show short related video lectures in the following ways:               <ul style="list-style-type: none"> <li>• As an introduction to new topics (pre-lecture activity).</li> <li>• As a revision of topics (post-lecture activity).</li> <li>• As additional examples (post-lecture activity).</li> <li>• As an additional material of challenging topics (pre-and post-lecture activity).</li> <li>• As a model solution of some exercises (post-lecture activity).</li> </ul> </li> </ol>			
<b>Module-1: Vector Calculus (8 hours)</b>			

Siddesh

1

H.O.D.

**Introduction to Vector Calculus in EC & EE engineering applications.**

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

**Vector Integration:** Line integrals, Surface integrals. Applications to work done by a force and flux. Statement of Green's theorem and Stoke's theorem. Problems.

**Self-Study:** Volume integral and Gauss divergence theorem.

**Applications:** Conservation of laws, Electrostatics, Analysis of streamlines and electric potentials.

**(RBT Levels: L1, L2 and L3)**

**Module-2: Vector Space and Linear Transformations(8 hours)**

**Importance of Vector Space and Linear Transformations in the field of EC & EE engineering applications.**

**Vector spaces:** Definition and examples, subspace, linear span, Linearly independent and dependent sets, Basis and dimension.

**Linear transformations:** Definition and examples, Algebra of transformations, Matrix of a linear transformation. Change of coordinates, Rank and nullity of a linear operator, Rank-Nullity theorem. Inner product spaces and orthogonality.

**Self-study:** Angles and Projections. Rotation, reflection, contraction and expansion.

**Applications:** Image processing, AI & ML, Graphs and networks, Computer graphics.

**(RBT Levels: L1, L2 and L3)**

**Module-3: Laplace Transform(8 hours)**

**Importance of Laplace Transform for EC & EE engineering applications.**

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

**Inverse Laplace Transforms:**

Definition, properties, evaluation using different methods, convolution theorem (without proof), problems, and applications to solve ordinary differential equations.

**Self-Study:** Verification of convolution theorem.

**Applications:** Signals and systems, Control systems, LR, CR & LCR circuits.

**(RBT Levels: L1, L2 and L3)**

**Module-4: Numerical Methods -1(8 hours)**

**Importance of numerical methods for discrete data in the field of EC & EE engineering applications.**

Solution of algebraic and transcendental equations: Regula-Falsi method and Newton-Raphson method (only formulae). Problems.

Finite differences, Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation formula (All formulae without proof). Problems.

**Numerical integration:** Trapezoidal, Simpson's  $(1/3)^{rd}$  and  $(3/8)^{th}$  rules (without proof). Problems.

**Self-Study:** Bisection method, Lagrange's inverse Interpolation, Weddle's rule.



**Applications:** Estimating the approximate roots, extremum values, area, volume, and surface area.  
(RBT Levels: L1, L2 and L3)

#### Module-5:Numerical Methods -2(8 hours)

**Introduction to various numerical techniques for handling EC & EE applications.**

**Numerical Solution of Ordinary Differential Equations (ODEs):**

Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor-corrector formula (No derivations of formulae). Problems.

**Self-Study:** Adam-Bashforth method.

**Applications:** Estimating the approximate solutions of ODE for electric circuits.

(RBT Levels: L1, L2 and L3)

**List of Laboratory experiments (2 hours/week per batch/ batch strength 15)**

**10 lab sessions + 1 repetition class + 1 Lab Assessment**

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

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

**Course outcome (Course Skill Set)**

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

CO1	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, lineintegral and surface integral.
CO2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation
CO3	To understand the concept of Laplace transform and to solve initial value problems.
CO4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.
CO5	Get familiarize with modern mathematical tools namely MATHEMATICA/MATLAB/PYTHON/ SCILAB

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

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

**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

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

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is



to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

#### **Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

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

#### **Suggested Learning Resources:**

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

##### **Text Books**

1. **B. S. Grewal:** "Higher Engineering Mathematics", Khanna Publishers, 44<sup>th</sup>Ed., 2021.
2. **E. Kreyszig:** "Advanced Engineering Mathematics", John Wiley & Sons, 10<sup>th</sup>Ed., 2018.

##### **Reference Books**

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

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

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

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

- Quizzes
- Assignments
- Seminar

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

COs	POs						
	1	2	3	4	5	6	7
CO1							
CO2							
CO3							
CO4							
CO5							

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

*Siddesh.*

H. O. D.

Dept. Of Electronics & Communication  
Alva Institute of Engg. & Technology  
Mijar, MOODBIDRI - 574 22.



16-2-2023

Course Title:	Introduction to Python Programming		
Course Code:	BPLCK105B/205B	CIE Marks	50
Course Type (Theory/Practical /Integrated )	Integrated	SEE Marks	50
Teaching Hours/Week (L:T:P: S)	2:0:2:0	Total Marks	100
Total Hours of Pedagogy	40 hours	Exam Hours	03
		Credits	03
<b>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>• Appraise the need for working with various documents like Excel, PDF, Word and Others.</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>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective <ol style="list-style-type: none"> <li>1. Use <a href="https://pythontutor.com/visualize.html#mode=edit">https://pythontutor.com/visualize.html#mode=edit</a> in order to visualize the python code</li> <li>2. Demonstrate and visualize basic data types (list, tuple, dictionary).</li> <li>3. Chalk and talk</li> <li>4. online and videos</li> </ol>			
<b>Module-1 (08 hrs)</b>			
<b>Python Basics:</b> Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program, <b>Flow control:</b> Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit(), <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, A Short Program: Guess the Number <b>Textbook 1: Chapters 1 – 3</b>			
<b>Module-2 (08 hrs)</b>			
<b>Lists:</b> The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples, References, <b>Dictionaries and Structuring Data:</b> The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things, <b>Textbook 1: Chapters 4 – 5</b>			
<b>Module-3 (08 hrs)</b>			

16-2-2023

	<p><b>Manipulating Strings:</b> Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup</p> <p><b>Reading and Writing Files:</b> Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module, Saving Variables with the print.format() Function, Project: Generating Random Quiz Files, Project: Multiclipboard,</p> <p><b>Textbook 1: Chapters 6 , 8</b></p>
	<b>Module-4 (08 hrs)</b>
	<p><b>Organizing Files:</b> The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates, Project: Backing Up a Folder into a ZIP File,</p> <p><b>Debugging:</b> Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE's Debugger.</p> <p><b>Textbook 1: Chapters 9-10</b></p>
	<b>Module-5 (08 hrs)</b>
	<p><b>Classes and objects:</b> Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying,</p> <p><b>Classes and functions:</b> Time, Pure functions, Modifiers, Prototyping versus planning,</p> <p><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, Polymorphism, Interface and implementation,</p> <p><b>Textbook 2: Chapters 15 – 17</b></p>
<b>Course outcome (Course Skill Set)</b>	
At the end of the course the student will be able to:	
C01	Demonstrate proficiency in handling loops and creation of functions.
C02	Identify the methods to create and manipulate lists, tuples and dictionaries.
C03	Develop programs for string processing and file organization
C04	Interpret the concepts of Object-Oriented Programming as used in Python.
<b>Programming Exercises:</b>	
<ol style="list-style-type: none"> <li> <ol style="list-style-type: none"> <li>Develop a program to read the student details like Name, USN, and Marks in three subjects. Display the student details, total marks and percentage with suitable messages.</li> <li>Develop a program to read the name and year of birth of a person. Display whether the person is a senior citizen or not.</li> </ol> </li> <li> <ol style="list-style-type: none"> <li>Develop a program to generate Fibonacci sequence of length (N). Read N from the console.</li> <li>Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).</li> </ol> </li> <li>Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages.</li> <li>Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable message.</li> <li>Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary</li> </ol>	



with distinct words and their frequency of occurrences. Sort the dictionary in the reverse order of frequency and display dictionary slice of first 10 items]

6. Develop a program to sort the contents of a text file and write the sorted contents into a separate text file. [Hint: Use string methods strip(), len(), list methods sort(), append(), and file methods open(), readlines(), and write()].
7. Develop a program to backing Up a given Folder (Folder in a current working directory) into a ZIP File by using relevant modules and suitable methods.
8. Write a function named DivExp which takes TWO parameters a, b and returns a value c ( $c=a/b$ ). Write suitable assertion for  $a>0$  in function DivExp and raise an exception for when  $b=0$ . Develop a suitable program which reads two values from the console and calls a function DivExp.
9. Define a function which takes TWO objects representing complex numbers and returns new complex number with a addition of two complex numbers. Define a suitable class 'Complex' to represent the complex number. Develop a program to read N ( $N \geq 2$ ) complex numbers and to compute the addition of N complex numbers.
10. Develop a program that uses class Student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint: Use list to store the marks in three subjects and total marks. Use \_\_init\_\_() method to initialize name, USN and the lists to store marks and total, Use getMarks() method to read marks into the list, and display() method to display the score card details.]

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

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

#### Continuous Internal Evaluation (CIE):

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

#### CIE for the theory component of the IC

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totaling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

#### CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be

evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.

- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

#### **Semester End Examination (SEE):**

##### **SEE for IC**

Theory SEE will be conducted by University as per the scheduled time table, with common question papers for the course (duration 03 hours)

1. The question paper will have ten questions. Each question is set for 20 marks.
2. 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.
3. The students have to answer 5 full questions, selecting one full question from each module.

**The theory portion of the Integrated Course shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper shall include questions from the practical component).**

##### **Passing standard:**

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks-30) in the theory component and 08 (40% of maximum marks -20) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 04/05 questions to be set from the practical component of IPCC, the total marks of all questions should not be more than 30 marks.



- SEE will be conducted for 100 marks and students shall secure 35% of the maximum marks to qualify for the SEE. Marks secured will be scaled down to 50.

**Suggested Learning Resources:****Text Books**

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)

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

- <https://www.learnbyexample.org/python/>
- <https://www.learnpython.org/>
- <https://pythontutor.com/visualize.html#mode=edit>

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

- 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>

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

COs	POs						
	1	2	3	4	5	6	7
C01							
C02							
C03							
C04							
C05							
Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped							

Siddesh ,  
H.O.D  
Dept. Of Electronics & Communication  
Atma Institute of Engg. & Technology  
Bijapur, Karnataka (India) - 574 221

## Professional Writing Skills in English

Course Title:	Professional Writing Skills in English		
Course Code:	BPWSK206-106	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

### Course objectives:

The course Professional Writing Skills in English (22PWS26) will enable the students,

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

### Teaching-Learning Process

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

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

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

**Language Lab :** To augment LSRW, grammar and Vocabulary skills (Listening, Speaking, Reading, Writing and Grammar, Vocabulary) through tests, activities, exercises etc., comprehensive web-based learning and assessment systems can be referred as per the AICTE / VTU guidelines.

#### Module-1

(03 hours of pedagogy)

**Identifying Common Errors in Writing and Speaking English :** Common errors identification in parts of speech, Use of verbs and phrasal verbs, Auxiliary verbs and their forms, Subject Verb Agreement (Concord Rules), Common errors in Subject-verb agreement, Sequence of Tenses and errors identification in Tenses. Words Confused/Misused.

#### Module-2

(03 hours of pedagogy)

**Nature and Style of sensible writing: Organizing** Principles of Paragraphs in Documents, Writing Introduction and Conclusion, Importance of Proper Punctuation, Precise writing and Techniques in Essay writing, Sentence arrangements and Corrections activities. Misplaced modifiers, Contractions, Collocations, Word Order, Errors due to the Confusion of words.

#### Module-3

(03 hours of pedagogy)

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

#### Module-4

(03 hours of pedagogy)

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

#### Module-5

(03 hours of pedagogy)

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



**Course outcome (Course Skill Set)**

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

CO1	To understand and identify the Common Errors in Writing and Speaking.
CO2	To Achieve better Technical writing and Presentation skills.
CO3	To read Technical proposals properly and make them to Write good technical reports.
CO4	Acquire Employment and Workplace communication skills.
CO5	To learn about Techniques of Information Transfer through presentation in different level.

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

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

**Continuous Internal Evaluation(CIE):****Two Unit Tests each of 30 Marks (duration 01 hour)**

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

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

**Two assignments each of 20 Marks**

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

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

**Suggested Learning Resources:****Textbook:**

- 1) "Professional Writing Skills in English" published by Fillip Learning – Education (ILS), Bangalore – 2022.
- 2) "Functional English" (As per AICTE 2018 Model Curriculum) (ISBN-978-93-5350-047-4) Cengage learning India Pvt Limited [Latest Edition 2019].

**Reference Books:**

- 1) **English for Engineers** by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.
- 2) **Technical Communication** by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.
- 3) **Technical Communication – Principles and Practice**, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017.
- 4) **High School English Grammar & Composition** by Wren and Martin, S Chandh & Company Ltd – 2015.
- 5) **Effective Technical Communication – Second Edition** by M Ashraf Rizvi, McGraw Hill Education (India) Private

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

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

Siddesh  
H.O.D.  
Dept. Of Electronics & Communication  
Sriva Institute of Engg. & Technology  
Warananasi, Madhuvaram - 574 224



16-2-2022

Course Title:	<b>Basic Electronics (For ECE and Allied Branches)</b>		
Course Code:	<b>BBEE103/203</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated)	Theory	SEE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Total Marks	100
Total Hours of Pedagogy	40 hours	Exam Hours	03
		Credits	03

**Course objectives:** Students will be taught

- Operation of Semiconductor diode, Zener diode and Special purpose diodes and their applications.
- Biasing circuits for transistor (BJT) as an amplifier.
- Study of linear Op-amps and its applications.
- Logic circuits and their optimization.
- Principles of Transducers and Communication.

### Teaching-Learning Process

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

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the functioning of various analog and digital circuits.
3. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
4. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.
5. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

### Module-1 (8 Hours)

**Semiconductor Diodes:** Introduction, PN Junction diode, Characteristics and Parameters, Diode Approximations, DC Load Line analysis (Text 1: 2.1,2.2,2.3,2.4)

**Diode Applications:** Introduction, Half Wave Rectification, Full Wave Rectification, Full Wave Rectifier Power Supply: Capacitor Filter Circuit, RC  $\pi$  Filter (includes numerical) (Text 1: 3.1,3.2,3.4,3.5)

**Zener Diodes:** Junction Breakdown, Circuit Symbol and Package, Characteristics and Parameters, Equivalent Circuit, Zener Diode Voltage Regulator. (Text 1: 2.9, 3.7)

### Module-2(8 Hours)

**Bipolar Junction Transistors:** Introduction BJT Voltages & Currents, BJT Amplification, Common Base Characteristics, Common Emitter Characteristics, Common Collector Characteristics, BJT Biasing: Introduction, DC Load line and Bias point (Text 1: 4.2, 4.3, 4.5,4.6, 5.1)

**Field Effect Transistor:** Junction Field Effect Transistor, JFET Characteristics, MOSFETs: Enhancement MOSFETs, Depletion Enhancement MOSFETs (Text 1: 9.1,9.2,9.5)

### Module-3(8 Hours)

**Operational Amplifiers:** Introduction, The Operational Amplifier, Block Diagram Representation of Typical Op-Amp, Schematic Symbol, Op-Amp parameters - Gain, input resistance, Output resistance, CMRR, Slew rate, Bandwidth, input offset voltage, Input bias Current and Input offset Current, The Ideal Op-Amp, Equivalent Circuit of Op-Amp, Open Loop Op-Amp configurations, Differential Amplifier, Inverting & Non Inverting Amplifier

**Op-Amp Applications:** Inverting Configuration, Non-Inverting Configuration, Differential Configuration, Voltage Follower, Integrator, Differentiator (Text 2: 1.1, 1.2, 1.3, 1.5, 2.2, 2.3, 2.4, 2.6, 6.5.1, 6.5.2, 6.5.3, 6.12, 6.13).

### Module-4(8 Hours)



**Boolean Algebra and Logic Circuits:** Binary numbers, Number Base Conversion, octal & Hexa Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates (Text 3: 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7)

**Combinational logic:** Introduction, Design procedure, Adders- Half adder, Full adder (Text 3: 4.1, 4.2, 4.3)

#### Module-5(8 Hours)

**Introduction to Transducers:** Introduction, Resistive Transducers, Inductive Transducers, Capacitive Transducers, Thermal transducers, Optoelectronic transducer, and Piezoelectric transducers (Text 4: Chapter 18: 18.1, 18.2, 18.3, 18.4, 18.5)

**Communications:** Introduction to communication, Communication System, Modulation (Text book 5: 1.1, 1.2, 1.3)

#### Course outcome (Course Skill Set)

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

**CO1:** Develop the basic knowledge on construction, operation and characteristics of semiconductor devices. (Level: C3)

**CO2:** Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices (Level: C3)

**CO3:** Develop competence knowledge to construct basic digital circuit by make use of basic gate and its function. (Level: C3)

**CO4:** Construct the conceptual blocks for basic communication system. (Level: C3)

**CO5:** Apply the knowledge of various transducers principle in sensor system. (Level: C3)

#### A. CO v/s PO Mapping Table

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

*Siddesh*

H.O.D.

Dept. Of Electronics & Communication  
"Kiva" Institute of Engg. & Technology  
"Mijar, MOGBIDRI - 574 22"

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

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

**Continuous Internal Evaluation(CIE):**

Three Tests each of 20 Marks;

- 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of 40 Marks.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to 50 marks

**Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

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

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

1. Electronic Devices and Circuits, David A Bell, 5<sup>th</sup> Edition, Oxford, 2016
2. Op-amps and Linear Integrated Circuits, Ramakanth A Gayakwad, Pearson Education, 4<sup>th</sup> Edition
3. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-8
4. Electronic Instrumentation and Measurements (3rd Edition) – David A. Bell, Oxford University Press, 2013
5. Electronic Communication Systems, George Kennedy, 4<sup>th</sup> Edition, TMH

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

- <https://nptel.ac.in/courses/122106025>
- <https://nptel.ac.in/courses/108105132>
- <https://nptel.ac.in/courses/117104072>



16-2-2022

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

- 
- 
- 
- 

*Siddesh*  
H.O.D.

Dept. Of Electronics & Communication  
Alva Institute of Engg. & Technology  
Mijar, MOODSIRA - 574232

## Theory - 01 Credit Course

**Communicative English**

Course Title:	<b>Communicative English</b>		
Course Code:	<b>BENGK106-206</b>	CIE Marks	50
Course Type (Theory/Practical /Integrated)	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01
<b>Course objectives:</b> The course Communicative English (22ENG16) will enable the students, 1. To know about Fundamentals of Communicative English and Communication Skills in general. 2. To train to identify the nuances of phonetics, intonation and enhance pronunciation skills for better Communication skills. 3. To impart basic English grammar and essentials of important language skills. 4. To enhance with English vocabulary and language proficiency for better communication skills. 5. To learn about Techniques of Information Transfer through presentation.			
<b>Teaching-Learning Process :</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching - Learning more effective: Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools and software's to meet the present requirements of the Global employment market. (i) Direct instructional method ( Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools), (iii) Blended learning (Combination of both), (iv) Enquiry and evaluation based learning, (v) Personalized learning, (vi) Problems based learning through discussion, (vii) Following the method of expeditionary learning Tools and techniques, (viii) Use of audio visual methods through language Labs in teaching of of LSRW skills. Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students In theoretical applied and practical skills in teaching of communicative skills in general.			
<b>Language Lab :</b> To augment LSRW, grammar and Vocabulary skills (Listening, Speaking, Reading, Writing and Grammar, Vocabulary) through tests, activities, exercises etc., comprehensive web-based learning and assessment systems can be referred as per the AICTE / VTU guidelines.			
<b>Module-1</b>			<b>(03 hours of pedagogy)</b>
<b>Introduction to Communicative English :</b> Communicative English, Fundamentals of Communicative English, Process of Communication, Barriers to Effective Communicative English, Different styles and levels in Communicative English. Interpersonal and Intrapersonal Communication Skills.			
<b>Module-2</b>			<b>(03 hours of pedagogy)</b>
<b>Introduction to Phonetics :</b> Phonetic Transcription, English Pronunciation, Pronunciation Guidelines to consonants and vowels, Sounds Mispronounced, Silent and Non silent Letters, Syllables and Structure. Word Accent, Stress Shift and Intonation, Spelling Rules and Words often Misspelt. Common Errors in Pronunciation.			
<b>Module-3</b>			<b>(03 hours of pedagogy)</b>
<b>Basic English Communicative Grammar and Vocabulary PART - I :</b> Grammar: Basic English Grammar and Parts of Speech, Articles and Preposition. Question Tags, One Word Substitutes, Strong and Weak forms of words, Introduction to Vocabulary, All Types of Vocabulary – Exercises on it.			
<b>Module-4</b>			<b>(03 hours of pedagogy)</b>
<b>Basic English Communicative Grammar and Vocabulary PART - II:</b> Words formation - Prefixes and Suffixes, Contractions and Abbreviations. Word Pairs (Minimal Pairs) – Exercises, Tense and Types of tenses, The Sequence of Tenses (Rules in use of Tenses) and Exercises on it.			
<b>Module-5</b>			<b>(03 hours of pedagogy)</b>
<b>Communication Skills for Employment :</b> Information Transfer: Oral Presentation and its Practice. Difference between Extempore/Public Speaking, Communication Guidelines. Mother Tongue Influence (MTI), Various Techniques for Neutralization of Mother Tongue Influence. Reading and Listening Comprehensions – Exercises.			



**Course outcome (Course Skill Set)**

At the end of the course Communicative English (22ENG16) the student will be able to:

CO1	Understand and apply the Fundamentals of Communication Skills in their communication skills.
CO2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
CO3	To impart basic English grammar and essentials of language skills as per present requirement.
CO4	Understand and use all types of English vocabulary and language proficiency.
CO5	Adopt the Techniques of Information Transfer through presentation.

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

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

**Continuous Internal Evaluation(CIE):****Two Unit Tests each of 30 Marks (duration 01 hour)**

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

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

**Two assignments each of 20 Marks**

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

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

**Suggested Learning Resources:****Textbook:**

- 1) **Communication Skills** by Sanjay Kumar & Pushp Lata, Oxford University Press India Pvt Ltd - 2019.
- 2) **A Textbook of English Language Communication Skills**, (ISBN-978-81-955465-2-7), Published by Infinite Learning Solutions, Bengaluru - 2022.

**Reference Books:**

1. **Technical Communication** by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.
2. **English for Engineers** by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.
3. **English Language Communication Skills – Lab Manual cum Workbook**, Cengage learning India Pvt Limited [Latest Revised Edition] – (ISBN-978-93-86668-45-5), 2019.
4. **A Course in Technical English – D Praveen Sam, KN Shoba**, Cambridge University Press – 2020.
5. **Practical English Usage** by Michael Swan, Oxford University Press – 2016.

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

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



Course Title:	<b>INTRODUCTION TO MECHANICAL ENGINEERING</b>		
Course Code:	<b>BESCK104D/204D</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Theory	SEE Marks	50
Teaching Hours/Week (L:T:P: S)	2:2:0:0	Total Marks	100
Total Hours of Pedagogy	40 hours	Exam Hours	03
		Credits	03
<b>Course Learning Objectives</b> <ul style="list-style-type: none"> <li>To develop basic Knowledge on Mechanical Engineering, Fundamentals and Energy Sources.</li> <li>Understand the concept of different types of Machine tool operations and Modern Manufacturing Processes like CNC, 3D printing.</li> <li>To know the concept of IC engines and Future Mobility vehicles.</li> <li>To give exposure in the field of Engineering Materials and Manufacturing Processes Technology and its applications</li> <li>To acquire a basic understanding role of Mechanical Engineering in the Robotics and Automation in industry.</li> </ul>			
<b>Teaching-Learning Process</b> <ul style="list-style-type: none"> <li>Adopt different types of teaching methods to develop the outcomes through PowerPoint presentations and Video demonstrations or Simulations.</li> <li>Arrange visits to show the live working models other than laboratory topics.</li> <li>Adopt collaborative (Group Learning) Learning in the class.</li> <li>Adopt Problem Based Learning (PBL), which fosters students Analytical skills and develops thinking skills such as evaluating, generalizing, and analyzing information.</li> </ul>			
<b>Module-1 (8 hours)</b>			
<b>Introduction:</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:</b> Introduction and applications of Energy sources like Fossil fuels, Nuclear fuels, Hydel, Solar, wind, and bio-fuels, Environmental issues like Global warming and Ozone depletion			
<b>Module-2 (8 hours)</b>			
<b>Machine Tool Operations:</b> Working Principle of lathe, Lathe operations: Turning, facing, knurling. Working principles of Drilling Machine, drilling operations: drilling, boring, reaming. Working of Milling Machine, Milling operations: plane milling and slot milling. (No sketches of machine tools, sketches to be used only for explaining the operations). <b>Introduction to Advanced Manufacturing Systems:</b> Introduction, components of CNC, advantages and applications of CNC, 3D printing.			
<b>Module-3 (8 hours)</b>			
<b>Introduction to IC Engines:</b> Components and Working Principles, 4-Stroke Petrol and Diesel Engines, Application of IC Engines. <b>Insight into Future Mobility;</b> Electric and Hybrid Vehicles, Components of Electric and Hybrid Vehicles. Advantages and disadvantages of EVs and Hybrid vehicles.			
<b>Module-4 (8 hours)</b>			
<b>Engineering Materials:</b> Types and applications of Ferrous & Nonferrous Metals, silica, ceramics, glass, graphite, diamond and polymer. Shape Memory Alloys. <b>Joining Processes:</b> Soldering, Brazing and Welding, Definitions, classification of welding process, Arc welding, Gas welding and types of flames.			
<b>Module-5 (8 hours)</b>			



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

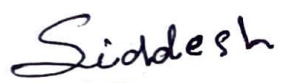
**Automation in industry:** Definition, types – Fixed, programmable and flexible automation, basic elements with block diagrams, advantages.

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

**Course Outcome (Course Skill Set)**

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

C01	Explain the concepts of Role of Mechanical Engineering and Energy sources.
C02	Describe the Machine Tool Operations and advanced Manufacturing process.
C03	Explain the Working Principle of IC engines and EV vehicles.
C04	Discuss the Properties of Common Engineering Materials and various Metal Joining Processes.
C05	Explain the Concepts of Mechatronics, Robotics and Automation in IoT

  
**H. O. D.**  
 Dept. Of Electronics & Communication  
 Alva's Institute of Engg. & Technology  
 Milan, MOODSIDRA - 574 22

### Assessment Details (both CIE and SEE)

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

#### Continuous Internal Evaluation(CIE):

Three Tests each of **20 Marks**;

- 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of **40 Marks**.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to **50 marks**

#### Semester End Examination(SEE):

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

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



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

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

**Reference Books:**

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

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

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

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

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

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

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C01	3					1	2			1		1
C02	3					1	1			1		1
C03	3					1	1			1		1
C04	3					1	1			1		1
C05	3					1	1			1		1

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

*Siddesh*

H. O. D.

Dept. Of Electronics & Communication  
 Anna Institute of Engg. & Technology  
 MGR, MOODBIDRI - 574 221

Course Title:	<b>GREEN BUILDINGS</b>		
Course Code:	<b>BETCK105B/205B</b>	CIE Marks	50
Course Type (Theory/Practical /Integrated )	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	3:0:0:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03

**Course objectives:** This course will enable students to:

- Understand the Definition, Concept & Objectives of the terms cost effective construction and green building
- Apply cost effective techniques in construction
- 3. Apply cost effective Technologies and Methods in Construction
- Understand the Problems due to Global Warming
- State the Concept of Green Building
- Understand Green Buildings

#### Teaching-Learning Process

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

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

#### Module-1 (08)

**Introduction to the concept of cost effective construction** -Uses of different types of materials and their availability -Stone and Laterite blocks- Burned Bricks- Concrete Blocks- Stabilized Mud Blocks- LimePozzolana Cement- Gypsum Board- Light Weight Beams- Fiber Reinforced Cement Components- Fiber Reinforced Polymer Composite- Bamboo- Availability of different materials- Recycling of building materials – Brick- Concrete- Steel- Plastics - Environmental issues related to quarrying of building materials.

#### Module-2 (08)



**Environment friendly and cost effective Building Technologies** - Different substitute for wall construction Flemish Bond - Rat Trap Bond – Arches – Panels - Cavity Wall - Ferro Cement and Ferro Concrete constructions – different pre cast members using these materials - Wall and Roof Panels – Beams – columns - Door and Window frames - Water tanks - Septic Tanks - Alternate roofing systems - Filler Slab - Composite Beam and Panel Roof -Pre-engineered and ready to use building elements - wood products - steel and plastic - Contributions of agencies - Costford - Nirmithi Kendra - Habitat

#### **Module-3(08)**

**Global Warming** – Definition - Causes and Effects - Contribution of Buildings towards Global Warming - Carbon Footprint – Global Efforts to reduce carbon Emissions Green Buildings – Definition - Features- Necessity – Environmental benefit - Economical benefits - Health and Social benefits - Major Energy efficient areas for buildings – Embodied Energy in Materials Green Materials - Comparison of Initial cost of Green V/s Conventional Building - Life cycle cost of Buildings.

#### **Module-4(08)**

**Green Building rating Systems-** BREEAM – LEED - GREEN STAR -GRIHA ( Green Rating for Integrated Habitat Assessment) for new buildings – Purpose - Key highlights - Point System with Differential weight age. Green Design – Definition - Principles of sustainable development in Building Design - Characteristics of Sustainable Buildings – Sustainably managed Materials - Integrated Lifecycle design of Materials and Structures (Concepts only)

#### **Module-5 (08)**

##### **Utility of Solar Energy in Buildings**

Utility of Solar energy in buildings concepts of Solar Passive Cooling and Heating of Buildings. Low Energy Cooling. Case studies of Solar Passive Cooled and Heated Buildings.

##### **Green Composites for Buildings**

Concepts of Green Composites. Water Utilisation in Buildings, Low Energy Approaches to Water Management. Management of Solid Wastes. Management of Sullage Water and Sewage. Urban Environment and Green Buildings. Green Cover and Built Environment.

##### **Course outcome (Course Skill Set)**

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

C01	Select different building materials for construction
C02	Apply effective environmental friendly building technology
C03	Analyze global warming due to different materials in construction
C04	Analyse buildings for green rating
C05	Use alternate source of energy and effective use water

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

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

**Continuous Internal Evaluation(CIE):**

Three Tests each of 20 Marks;

- 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- Assignments/Seminar/quiz/group discussion /field survey & report presentation/ course project/Skill development activities, suitably planned to attain the COs and POs for a total of 40 Marks.

If the nature of the courses requires assignments/Seminars/Quizzes/group discussion two evaluation components shall be conducted. If course project/field survey/skill development activities etc then the evaluation method shall be one.

Total CIE marks (out of 100 marks) shall be scaled down to 50 marks

**Semester End Examination (SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

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

**Suggested Learning Resources:****Text Books**

1. HarharaIyer G, Green Building Fundamentals, Notion Press
2. Dr. Adv. HarshulSavla, Green Building: Principles & Practices



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

- <https://www.youtube.com/watch?v=THgQF8zHBW8>
- [https://www.youtube.com/watch?v=DRO\\_rIkywxQ](https://www.youtube.com/watch?v=DRO_rIkywxQ)
- 
- 

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

- Students have to visit a building which is green rated and prepare a report

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

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
C01	2	1				1	1					
C02	2	1				1	1					
C03	2	1				1	1					
C04	2	1				1	1					
C05	2	1				1	1					

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

**Note:** Depending on the assessment tool used, higher order POs can be identified by the concerned course instructor.

*Siddesh*

H.O.D.

Dept. Of Electronics & Communication  
Siva Institute of Engg. & Technology  
Major Road, Chittoor - 524 002

**Indian Constitution**

Course Title:	Indian Constitution		
Course Code:		CIE Marks	50
Course Type (Theory/Practical /Integrated)	BICOK107-207	SEE Marks	50
Teaching Hours/Week (L:T:P: S)		Total Marks	100
Total Hours of Pedagogy	15 hours	Exam Hours	01 Theory
		Credits	01

**Course objectives :**

The course **INDIAN CONSTITUTION (22IC017 / 27)** will enable the students,

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

**Teaching-Learning Process**

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

- (i) Direct instructional method ( Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools), (iii) Blended learning (Combination of both), (iv) Enquiry and evaluation based learning, (v) Personalized learning, (vi) Problems based learning through discussion.
- (iii) Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students In theoretical applied and practical skills.

**Module-1****(03 hours of pedagogy)**

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

**Module-2****(03 hours of pedagogy)**

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

**Module-3****(03 hours of pedagogy)**

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

**Module-4****(03 hours of pedagogy)**

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

**Module-5****(03 hours of pedagogy)**

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

**Course outcome (Course Skill Set)**

At the end of the course 22IC017/27 the student will be able to:

C01	Analyse the basic structure of Indian Constitution.
C02	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
C03	know about our Union Government, political structure & codes, procedures.
C04	Understand our State Executive & Elections system of India.
C05	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.



### Assessment Details (both CIE and SEE)

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

#### Continuous Internal Evaluation(CIE):

##### Two Unit Tests each of 30 Marks (duration 01 hour)

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

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

##### Two assignments each of 20 Marks

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

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

#### Semester End Examinations (SEE)

SEE paper shall be set for **50 questions, each of the 01 mark**. The pattern of the **question paper is MCQ** (multiple choice questions). The time allotted for SEE is **01 hour**. The student must secure a minimum of 35% of the maximum marks for SEE.

#### Suggested Learning Resources:

##### Textbook:

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

##### Reference Books:

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

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

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

*Siddesh*

H.O.B.

Dept. Of Electronics & Communication  
Jyoti Institute of Engg. & Technology  
Aijal, MOODBIDRI - 574 225







Process	Simulation exercises for collaborated enabled design thinking Live examples on the success of collaborated design thinking	
Module-3		
Design Thinking in IT Design Thinking to Business Process modelling – Agile in Virtual collaboration environment – Scenario based Prototyping		
Teaching-Learning Process	Case studies on design thinking and business acceptance of the design Simulation on the role of virtual eco-system for collaborated prototyping	
Module-4		
DT For strategic innovations Growth – Story telling representation – Strategic Foresight - Change – Sense Making - Maintenance Relevance – Value redefinition - Extreme Competition – experience design - Standardization – Humanization - Creative Culture – Rapid prototyping, Strategy and Organization – Business Model design.		
Teaching-Learning Process	Business model examples of successful designs Presentation by the students on the success of design Live project on design thinking in a group of 4 students	
Module-5		
Design thinking workshop Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test		
Teaching-Learning Process	8 hours design thinking workshop from the expert and then presentation by the students on the learning from the workshop	
Course Outcomes: Upon the successful completion of the course, students will be able to:		
CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Appreciate various design process procedure	K2
CO2	Generate and develop design ideas through different technique	K2
CO3	Identify the significance of reverse Engineering to Understand products	K2
CO4	Draw technical drawing for design ideas	K3

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

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

**Continuous Internal Evaluation (CIE):**

- Two Tests (preferably in MCQ pattern ) each of **30 Marks**; The first test after the completion of the 40 -50% syllabus of the course. A second test after the completion of 90-100% of the syllabus of the course.
- Two Assignments/two quizzes/two seminars/one field survey and report presentation/one-course project totaling **40 marks**

Total Marks scored (test + assignments) out of 100 shall be scaled down to **50 marks**

At the beginning of the semester, the instructor/faculty teaching the course has to announce the methods of CIE for the course.

The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course). CIE methods /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

**Semester-End Examination:**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for subject

SEE paper will be set for 50 questions of each of 01 marks. The pattern of the question paper is MCQ. The time allotted for SEE is **01 hour**

**Suggested Learning Resources:****Text Books :**

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

**References:**



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

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

1. [www.tutor2u.net/business/presentations/. /productlifecycle/default.html](http://www.tutor2u.net/business/presentations/. /productlifecycle/default.html)
2. [https://docs.oracle.com/cd/E11108\\_02/otn/pdf/. /E11087\\_01.pdf](https://docs.oracle.com/cd/E11108_02/otn/pdf/. /E11087_01.pdf)
3. [www.bizfilings.com](http://www.bizfilings.com) › Home › Marketing › Product Development
4. <https://www.mindtools.com/brainstm.html>
5. <https://www.quicksprout.com/. /how-to-reverse-engineer-your-competit>
6. [www.vertabelo.com/blog/documentation/reverse-engineering](http://www.vertabelo.com/blog/documentation/reverse-engineering)  
<https://support.microsoft.com/en-us/kb/273814>
7. <https://support.google.com/docs/answer/179740?hl=en>
8. <https://www.youtube.com/watch?v=2mjSDIBaUIM>  
[thevirtualinstructor.com/foreshortening.html](http://thevirtualinstructor.com/foreshortening.html)  
<https://dschool.stanford.edu/.../designresources/.../ModeGuideBOOTCAMP2010L.pdf>  
<https://dschool.stanford.edu/use-our-methods/> 6. <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process> 7.  
<http://www.creativityatwork.com/design-thinking-strategy-for-innovation/> 49 8.  
<https://www.nngroup.com/articles/design-thinking/> 9.  
<https://designthinkingforeducators.com/design-thinking/> 10.  
[www.designthinkingformobility.org/wp-content/.../10/NapkinPitch\\_Worksheet.pdf](http://www.designthinkingformobility.org/wp-content/.../10/NapkinPitch_Worksheet.pdf)

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

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

[https://onlinecourses.nptel.ac.in/noc19\\_mg60/preview](https://onlinecourses.nptel.ac.in/noc19_mg60/preview)

*Siddesh*

M. D. D.

Dept. Of Electronics & Communication  
Jawahar Institute of Engg. & Technology  
Mijar, MADURAI - 625 023

**I Semester**

<b>Course Title:</b>	<b>Mathematics-I for Electrical &amp; Electronics Engineering Stream</b>		
<b>Course Code:</b>	<b>BMATE101</b>	<b>CIE Marks</b>	50
<b>Course Type</b> (Theory/Practical/Integrated)	Integrated	<b>SEE Marks</b>	50
		<b>Total Marks</b>	100
<b>Teaching Hours/Week (L:T:P: S)</b>	2:2:2:0	<b>Exam Hours</b>	03
<b>Total Hours of Pedagogy</b>	40 hours Theory + 10 to 12 Lab slots	<b>Credits</b>	04

**Course objectives:** The goal of the course **Mathematics-I for Electrical & Electronics Engineering stream (22MATE11)** is to

- **Familiarize** the importance of calculus associated with one variable and multivariable for Electrical and Electronics engineering.
- **Analyze** Electrical and Electronics engineering problems by applying Ordinary Differential Equations.
- **Familiarize** the important tools in Integral Calculus that are essential in Electrical and Electronics engineering.
- **Develop** the knowledge of Linear Algebra to solve the system of equations.

**Teaching-Learning Process****Pedagogy (General Instructions):**

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

1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop students' theoretical and applied mathematical skills.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples.
3. Support and guide the students for self-study.
4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.
5. Encourage the students to group learning to improve their creative and analytical skills.
6. Show short related video lectures in the following ways:
  - As an introduction to new topics (pre-lecture activity).
  - As a revision of topics (post-lecture activity).
  - As additional examples (post-lecture activity).
  - As an additional material of challenging topics (pre-and post-lecture activity).
  - As a model solution of some exercises (post-lecture activity).

**Module-1: Calculus (8 hours)**

**Introduction to polar coordinates and curvature relating to EC & EE Engineering applications.** Polar coordinates, Polar curves, angle between the radius vector and the tangent, angle between two curves. Pedal equations. Curvature and Radius of curvature - Cartesian, Parametric, Polar and Pedal forms. Problems.

**Self-study:** Center and circle of curvature, evolutes and involutes.

**Applications:** Communication signals, Manufacturing of microphones, and Image processing.  
(RBT Levels: L1, L2 and L3)

**Module-2: Series Expansion and Multivariable Calculus (8 hours)**



### Introduction of series expansion and partial differentiation in EC & EE Engineering applications.

Taylor's and Maclaurin's series expansion for one variable (Statement only) – problems. Indeterminate forms - L'Hospital's rule - Problems.

Partial differentiation, total derivative - differentiation of composite functions. Jacobian and problems. Maxima and minima for a function of two variables. Problems.

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

**Applications:** Series expansion in communication signals, Errors and approximations, and vector calculus.

(RBT Levels: L1, L2 and L3)

### Module-3: Ordinary Differential Equations (ODEs) of First Order (8 hours)

**Introduction to first-order ordinary differential equations pertaining to the applications for EC & EE engineering.**

Linear and Bernoulli's differential equations. Exact and reducible to exact differential equations- Integrating factors on  $\frac{1}{N}\left(\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}\right)$  and  $\frac{1}{M}\left(\frac{\partial N}{\partial x} - \frac{\partial M}{\partial y}\right)$ . Orthogonal trajectories, L-R and C-R circuits.

Problems.

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

**Self-Study:** Applications of ODEs, Solvable for x and y.

**Applications of ordinary differential equations:** Rate of Growth or Decay, Conduction of heat.

(RBT Levels: L1, L2 and L3)

### Module-4: Integral Calculus (8 hours)

**Introduction to Integral Calculus in EC & EE Engineering applications.**

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

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

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

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

(RBT Levels: L1, L2 and L3)

### Module-5: Linear Algebra (8 hours)

**Introduction of linear algebra related to EC & EE engineering applications.**

Elementary row transformation of a matrix, Rank of a matrix. Consistency and Solution of system of linear equations - Gauss-elimination method, Gauss-Jordan method and approximate solution by Gauss-Seidel method. Eigenvalues and Eigenvectors, Rayleigh's power method to find the dominant Eigenvalue and Eigenvector.

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



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

**(RBT Levels: L1, L2 and L3)**

**List of Laboratory experiments (2 hours/week per batch/ batch strength 15)**

**10 lab sessions + 1 repetition class + 1 Lab Assessment**

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

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

**Course outcome (Course Skill Set)**

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

CO1	apply the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions
CO2	analyze the solution of linear and nonlinear ordinary differential equations
CO3	apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume
CO4	make use of matrix theory for solving the system of linear equations and compute eigenvalues and eigenvectors
CO5	familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB/ PYTHON/SCILAB

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

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

**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course



project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

#### **CIE for the practical component of the IC**

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

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

#### **Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

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

#### **Suggested Learning Resources:**

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

##### **Text Books**

1. **B. S. Grewal:** "Higher Engineering Mathematics", Khanna Publishers, 44<sup>th</sup>Ed., 2021.
2. **E. Kreyszig:** "Advanced Engineering Mathematics", John Wiley & Sons, 10<sup>th</sup>Ed., 2018.

##### **Reference Books**

1. **V. Ramana:** "Higher Engineering Mathematics" McGraw-Hill Education, 11<sup>th</sup> Ed., 2017
2. **Srimanta Pal & Subodh C.Bhunia:** "Engineering Mathematics" Oxford University Press,

3<sup>rd</sup> Ed., 2016.

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

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

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

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

- Quizzes
- Assignments
- Seminar

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

COs	POs						
	1	2	3	4	5	6	7
CO1							
CO2							
CO3							
CO4							
CO5							

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

*Siddesh*

H. O. D.

Dept. Of Electronics & Communication  
Siva Institute of Engg. & Technology  
Majur, MOODBIDRI - 574 221



Course Title:	<b>Applied Physics for EEE Stream</b>		
Course Code:	<b>BPHYE102/202</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours+10-12 Lab Slots	Credits	04
<b>Course objectives</b> <ul style="list-style-type: none"> <li>To study the principles of quantum mechanics</li> <li>To understand the properties of dielectrics and superconductors</li> <li>To study the essentials of photonics for engineering applications.</li> <li>To understand fundamentals of vector calculus and EM waves.</li> <li>To study the knowledge about semiconductors and devices.</li> </ul>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective <ol style="list-style-type: none"> <li>1. Flipped Class</li> <li>2. Chalk and Talk</li> <li>3. Blended Mode of Learning</li> <li>4. Simulations, Interactive Simulations and Animations</li> <li>5. NPTEL and Other Videos for theory topics</li> <li>6. Smart Class Room</li> <li>7. Lab Experiment Videos</li> </ol>			
<b>Module-1 (08 Hours)</b>			
<b>Quantum Mechanics:</b> de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus-Non Relativistic), Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation, Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one dimensional infinite potential well, Waveforms and Probabilities. Numerical Problems			
<b>Pre-requisite: Wave-Particle dualism</b> <b>Self-learning: de Broglie Hypothesis</b>			
<b>Module-2 (08 hours)</b>			
<b>Electrical Properties of Solids:</b> <b>Conductors:</b> Quantum Free Electron Theory of Metals: Assumptions, Fermi-energy, Fermi factor, Variation of Fermi Factor with Temperature and Energy, Mention of expression for electrical conductivity. <b>Dielectric Properties:</b> Polar and non-polar dielectrics, Electrical Polarization Mechanisms, internal fields in solids, Clausius-Mossotti equation (Derivation), Solid, Liquid and Gaseous dielectrics. Application of dielectrics in transformers, Capacitors, Electrical Insulation. Numerical Problems. <b>Superconductivity:</b> Introduction to Superconductors, Temperature dependence of resistivity, Meissner Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative), High Temperature superconductivity, SQUID, MAGLEV, Numerical problems.			
<b>Pre-requisites: Classical Free Electron Theory</b> <b>Self-learning: Dielectrics Basics</b>			
<b>Module-3 ( 08 hours)</b>			
<b>Lasers and Optical Fibers:</b> <b>Lasers:</b> Characteristics of LASER, Interaction of radiation with matter, Expression for Energy Density and its significance. Requisites of a Laser System. Conditions for Laser action. Principle, Construction and Working of Carbon Dioxide Laser. Application of Lasers in Defense (Laser range finder) and Laser Printing. Numerical			



**Problems**

**Optical Fibers:** Total Internal Reflection, Propagation mechanism, Angle of Acceptance, Numerical Aperture, Fractional Index Change, Modes of Propagation, Number of Modes and V Number, Types of Optical Fibers. Attenuation and Mention of Expression for Attenuation coefficient, Attenuation Spectrum of an Optical Fiber with Optical Windows. Discussion of Block Diagram of Point to Point Communication, Intensity based Fiber Optic Displacement Sensor, Merits and Demerits, Numerical problems.

**Pre-requisite: Properties of light**

**Self-learning: Total Internal Reflection**

**Module-4 (08 hours)****Maxwell's Equations and EM waves:**

**Maxwell's Equations:** Fundamentals of Vector Calculus. Divergence and Curl of Electric field and Magnetic field (static), Gauss' divergence theorem and Stoke's theorem. Description of laws of Electrostatics, Magnetism, Faraday's laws of EMI, Current Density, Equation of Continuity, Displacement Current (with derivation), Maxwell's equations in vacuum, Numerical Problems

**EM Waves:** The wave equation in differential form in free space (Derivation of the equation using Maxwell's equations), Plane Electromagnetic Waves in vacuum, their transverse nature.

**Pre-requisite: Electricity & Magnetism**

**Self-learning: Fundamentals of vector calculus.**

**Module-5 (08 hours)****Semiconductors and Devices:**

Fermi level in Intrinsic & Extrinsic Semiconductor, Expression for concentration of electrons in conduction band & holes concentration in valance band (only mention the expression), Relation between Fermi energy & Energy gap in intrinsic semiconductors (derivation), Law of mass action, Electrical conductivity of a semiconductor (derivation), Hall effect, Expression for Hall coefficient (derivation) and its application. Photo-diode and Power responsivity, Construction and working of Semiconducting Laser, Four probe method to determine resistivity, Phototransistor, Numerical problems.

**Pre-requisite: Basics of Semiconductors**

**Self-learning: Fermi level in Intrinsic & Extrinsic Semiconductor**

**Course outcome (Course Skill Set)**

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

CO1	Describe the fundamental principles of the Quantum Mechanics and the essentials of Photonics.
CO2	Elucidate the concepts of conductors, dielectrics and superconductivity
CO3	Discuss the fundamentals of vector calculus and their applications in Maxwell's Equations and EM Waves.
CO4	Summarize the properties of semiconductors and the working principles of semiconductor devices.
CO5	Practice working in groups to conduct experiments in physics and Perform precise and honest measurements.

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

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

**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be 30 marks and for the laboratory component 20 Marks.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.



Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

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

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

**Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada. The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

**Suggested Learning Resources:**

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

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

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

Laser:<https://www.britannica.com/technology/laser.k>

Laser:<https://nptel.ac.in/courses/115/102/115102124/>

Quantum mechanics:<https://nptel.ac.in/courses/115/104/115104096/>

Physics:<http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>

Numerical Aperture of fiber:<https://bop-iitk.vlabs.ac.in/exp/numerical-aperture-measurement>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**<http://nptel.ac.in><https://swayam.gov.in><https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham><https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>[https://virtuallabs.merlot.org/vl\\_physics.html](https://virtuallabs.merlot.org/vl_physics.html)<https://phet.colorado.edu><https://www.mypysicslab.com>**Laboratory Component:**

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

Note: The experiments have to be classified into

- Exercise
- Demonstration
- Structured Inquiry
- Open Ended

Based on the convenience classify the following experiments into above categories selecting at least three experiments for each type. Select at least one simulation/spreadsheet activity.

**List of Experiments**

- Determination of wavelength of LASER using Diffraction Grating.
- Determination of acceptance angle and numerical aperture of the given Optical Fiber.
- Determination of Magnetic Flux Density at any point along the axis of a circular coil.
- Determination of resistivity of a semiconductor by Four Probe Method
- Study the I-V Characteristics of the Given Bipolar Junction Transistor.
- Determination of dielectric constant of the material of capacitor by Charging and Discharging method.
- Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light.
- Study the frequency response of Series & Parallel LCR circuits.
- Determination of Plank's Constant using LEDs.
- Determination of Fermi Energy of Copper.
- Identification of circuit elements in a Black Box and determination of values of the components.
- Determination of Energy gap of the given Semiconductor.
- Step Interactive Physical Simulations.
- Study of motion using spread Sheets
- Study of Application of Statistics using spread sheets
- PHET Interactive

Simulations([https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html\\_prototype](https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html_prototype))**COs and POs Mapping (Individual teacher has to fill up)**

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

**Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped**

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

Siddesh

H. O. D.

 Dept. Of Electronics & Communication  
 Anna Institute of Engg. & Technology  
 Mugal MOODBIDRI - 574 25