First year Engineering

Course Plan 2023-24 Even– Semester

(Chemistry Group)

INSTITUTE VISION

To be a preferred institution in Engineering Education by achieving excellence in teaching and research and to remain as a source of pride for its commitment to holistic development of individual and society.

INSTITUTE MISSION

To continuously strive for the overall development of students by educating them in a state-of-the-art-infrastructure, by retaining the best practices, people and inspire them to imbibe real time problem solving skills, leadership qualities, human values and societal commitments, so that they emerge as competent professionals.

PROGRAMME OUTCOMES (POs)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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6.	Scheme of Teaching & Examination	

STUDENT HELP DESK

Sl. No	Purpose	Contact Person	
		Faculty	Instructor
1	Attestations	Prof. M. P. Yenagimath	--
2	Time table	Prof. V.M. Bhumannavar	--
3	I.A. Test Coordinator and EMS Coordinator (Online submission of exam form / revaluation form to VTU)	Dr. S. J. Walki Prof. S. B. Radder	Mrs. S.S. Kankanwadi Mr. G. B. Dodagoudar
4	Students' Counseling &Discussion with parents	Dr. M.S. Hanagadakar Prof. V.M. Bhumannavar	--
5	Extra-Curricular & Co- Curricular Activities	Dr. S. L. Patil	Mrs. S.S. Kankanwadi Mr. G. B. Dodagoudar
7	Dispensary	Dr. Arun. G. Bullannavar Cell No.9449141549	
8	First Year Information	Prof. M. P. Yenagimath First Year Coordinator Mobile No: 9341449466 E-mail ID-hod.1yr@hsit.ac.in	

DEPARTMENTAL RESOURCES
FACULTY POSITION

S.N.	Category	No. in position	Average experience
1	Teaching faculty	16	14
2	Technical supporting staff	01	18
3	Helper	01	18

MAJOR LABORATORIES

S.N.	Name of the laboratory	Area in Sq. Mtrs	Amount Invested (Rs.)
1.	Engg. Chemistry Lab	200	13,83,479.00
2.	C programming Lab	200	18,75,652.00

Total Investment in the Department **Rs. 31,96,783.00**

TEACHING FACULTY DETAILS

S.N.	Name	Designation	Qualification	Specialization	Teaching Exp(In yrs)	Phone No.
1.	Dr. B. V. Madiggond	Prof. & HOD	M.Tech .Ph.D	Power Electronics	30	9343454993
2.	Dr. S. N. Topannavar	Prof. & Head	M.Tech .Ph.D	Thermal Power Engineering.	25	9482440235
3.	Dr. M. S. Hanagadakar	Asso.Prof.	M.Sc. Ph.D	Physical Chemistry	17	8310768223
4.	Dr. S. L. Patil	Asst.Prof.	M.Sc. Ph.D	Graph Theory	14	8867664082
5.	Dr. S. J. Walki	Asst.Prof.	M.Sc. Ph.D	Organic Chemistry	08	8105787069
6.	Prof. D. N. Inamdar	Asst.Prof.	M.Tech	Tool Design	22	9591208980
7.	Prof. S.S. Patil	Asst.Prof.	M.Tech	VLSI Design & Embedded Systems	19	9448102010
8.	Prof. G.M. Zulapi	Asst.Prof.	M.Tech	Product Design and Manufacturing	17	9480213587
9.	Prof. D. B. Madihalli	Asst.Prof.	M.Tech	Industrial Electronics	16	9902854324
10.	Prof. M. A. Hipparagi	Asst.Prof.	M.Tech	Production	4	7411507405
11.	Prof. P. I. Savadatti	Asst.Prof.	M.Tech	Digital Electronics	8	9964315436
12.	Prof. I.N. Kambar	Asst.Prof.	M.Sc	Mathematics	1.5	9164296006
13.	Dr. Tanuja S B	Asst.Prof	M.Sc. Ph.D	Physical Chemistry	6	8762892932
14.	Prof. B. S. Hooli	Asst.Prof	M.A	English	20	9353476479
15/.	Prof. B. S. Koteppagol	Asst.Prof	M.A	Kannada	5	9480849333

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	
					L	T	P	S					
1	*ASC(IC)	BMATE101	Mathematics for EES-I	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	BENGK106	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMS	BICOK107	Indian Constitution	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BKSKK107/ BKBKK107	Samskrutika Kannada/ Balake Kannada										
8	HSMS	BSFHK158	Scientific Foundations of Health	Any Dept.	1	0	0	0	01	50	50	100	01
			OR										
		BIDTK158	Innovation and Design Thinking		1	0	0	0	01				
				TOTAL						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

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 (Mechanical 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	
					L	T	P	S					
1	*ASC(IC)	BMATM101	Mathematics for ME Streams-I	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	BCHEM102	Chemistry for ME Streams	Chemistry	2	2	2	0	03	50	50	100	04
3	ESC	BCEDK103	Computer Aided Engineering Drawing	Civil/Mech Engg dept	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	BENGK106	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMS	BICOK107	Indian Constitution	Humanities	1	0	0	0	01	50	50	100	01
		OR											
		BKSK0107 BKBKK107	Samskrutika Kannada/ Balake Kannada										
8	AEC/SEC	BSFHK158	Scientific Foundations for Health	Any Dept	1	0	0	0	01	50	50	100	01
	OR												
		BIDTK158	Innovation and Design Thinking		1	0	0	0	01				
				TOTAL						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

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 (Civil Engineering Stream) (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)	BMATC101	Mathematics for Civil Engg Stream-I	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	BCHEC102	Chemistry for Civil Engg Stream-I	Chemistry	2	2	2	0	03	50	50	100	04
3	ESC	BCEDK103	Computer-aided engineering Drawing	Civil/Mech Engg dept	2	0	2	0	03	50	50	100	03
4	ESC-I	BESCK104x	Engineering Science Course-I	Respective 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	BENGK106	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMS	BICOK107	Indian Constitution	Humanities	1	0	0	0	01	50	50	100	01
		OR											
		BKSK107/ BKBK107	Samskrutika Kannada/ Balake Kannada										
8	HSMS	BSFHK158	Scientific Foundations of Health	AnyDept	1	0	0	0	01	50	50	100	01
	OR												
	HSMS	BITDK158	Innovation and Design Thinking	Any Dept	1	0	0	0	01				
				TOTAL	15	06	10	00	27	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,

Visvesvaraya Technological University, Belagavi

Schemeof Teaching and Examinations-2022

Outcome-Based Education(OBE)andChoiceBasedCreditSystem(CBCS)

(Effectivefromtheacademicyear 2022-23)

I Semester (CSE 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	
					L	T	P	S					
1	*ASC(IC)	BMATS101	**Mathematics-I** forCSE Stream	Maths	2	2	2	0	03	50	50	100	04
2	#ASC(IC)	BCHES102	**Applied Chemistry** for CSE Stream	Chemistry	2	2	2	0	03	50	50	100	04
3	ESC	BCEDK103	Computer-Aided Engineering Drawing	Civil/Mech Engg dept	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										
7	HSMS	BICOK107	Indian Constitution	Humanities	1	0	0	0	01	50	50	100	01
			OR										
		BKSKK107/ BKBKK107	Samskrutika Kannada/ Balake Kannada		1	0	0	0					
8	HSMS	BSFHK158	Scientific Foundations of Health	Any Dept	1	0	0	0	01	50	50	100	01
			OR										
		BIDTK158	Innovation and Design Thinking		1	0	0	0	02				
				TOTAL						**400**	**400**	**800**	**20**

Subject Title	**Mathematics-II for Computer Science & Engineering Stream**		
Subject Code	BMATS201	**IA Marks**	50
Number of Lecture Hrs / Week	04	**Exam Marks**	50
Total Number of Lecture Hrs	40	**Exam Hours**	03
CREDITS – 04			

FACULTY DETAILS:		
Name: Prof. I .N. Kambar Prof. S. A. Patil	**Designation :** Asst.Prof. .	**Experience:** 1.6 years 12 years
No. of times course taught 02 (including present)	**Specialization:** Mathematics	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	First Year Engineering	I	Calculus and Linear Algebra

2.0 Course Objectives

This course viz., Advanced Calculus and Numerical Methods aims to prepare the students:

- **Familiarize** the importance of Integral calculus and Vector calculus essential for electronics
- **Analyze** electronics and electrical engineering problems by applying Partial Differential Equations.
- **Develop** the knowledge of solving electronics and electrical engineering problems numerically.

3.0 Course Outcomes

Having successfully completed this course, the student will be able to

	Refined Course Outcome	Cognitive Level	POs
C201.1	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume	L1, L2,L3	1,2,4,12
C201.2	Understand the applications of vector calculus refer to solenoidal, irrotational vectors, line integral and surface integral.	L1, L2,L3	1,2,4,12
C201.3	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation	L1, L2,L3	1,2,4,12
C201.4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.	L1, L2,L3	1,2,4,12
C201.5	Get familiarize with modern mathematical tools namely SCILAB/PYTHON/MATLAB	L1, L2,L3	1,2,4,12

4.0 Course Content

Module – 1

Introduction to Integral Calculus in Computer Science & Engineering

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: Center of gravity, Duplication formula
Applications: Antenna and wave propagation, Calculation of optimum value in various geometries, Problems.

(RBTL: L1, L2 & L3)

Module – 2

Introduction to Vector Calculus in Computer Science & Engineering

Vector Differentiation: Scalar and vector fields. Gradient, directional derivative, curl and divergence - physical interpretation, Solenoidal and irrotational vector fields and problems.
Curvilinear coordinates: Scale factors, base vectors, Cylindrical polar coordinates, Spherical polar coordinates, transformation between cartesian and curvilinear systems, orthogonality. Problems..
Self-Study: Volume integral and Gauss divergence theorem.
Applications: Conservation of laws, Electrostatics, Analysis of streamlines and electric potentials.

(RBTL: L1, L2 & L3)

Module – 3

Importance of Vector Space and Linear Transformations in the field of CS 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.

(RBTL: L1, L2 & L3)

Module –4

Importance of numerical methods for discrete data in the field of CS 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.
N**umerical integration**: Trapezoidal, Simpson's $(1/3)_{rd}$ and $(3/8)_{th}$ rules (without proof). Problems.
S**elf-Study:** Bisection method, Lagrange's inverse Interpolation, Weddle's rule.
Applications: Estimating the approximate roots, extremum values, Area, volume, and surface area.

(RBTL: L1, L2 & L3)

Module –5

Introduction to various numerical techniques for handling CS applications.
Numerical Solution of Ordinary Differential Equations (ODEs):
Numerical solution of ordinary differential equations of first order and first degree - Taylors series method, Modified Euler's method, Runge-Kutta method of fourth order and Milnes predictor corrector formula (No derivations of formulae). Problems.

Self-Study: Adam-Bashforth method.
Applications: Estimating the approximate solutions of ODE for electric circuits.

(RBTL: L1, L2 & L3)

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	Common to all	Common to all Engineering subjects	Electromagnetic fields, gravitational fields, fluid flow, fluid dynamics, Free Vibrations. Forced Vibrations, Time, Latitude, Longitude, Altitude etc.

6.0 Relevance to Real World

Sl. No	Real World Mapping
01	Vector calculus is used in electromagnetic fields, gravitational fields, and fluid flow. Vector integration is used in Electromagnetic field, Gravitational field, fluid flow.
02	Image processing, AI & ML, Graphs and networks, computer graphics.
03	Laplace transform are used in various areas of physics, electrical engineering, control engineering, optics, mathematics and signal processing. Laplace Transform is widely used by electronic engineers to solve quickly differential equations occurring in the analysis of electronic circuits
04	Estimating the approximate roots, extremum values, Area, volume, and surface area.
05	Numerical Methods are used in all fields of engineering and the physical sciences, life sciences, social sciences, medicine, business and even the arts have adopted elements of scientific computations.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Integrals

8.0 Books Used and Recommended to Students

Text Books

1. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, 44th Ed., 2021.
2. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed. (Reprint), 2018.

Reference Books

1. N.P.Bali and Manish Goyal: A Text Book of Engineering Mathematics, Laxmi Publishers, Latest edition 10th Ed., 2022..
2. B.V.Ramana: "Higher Engineering Mathematics" 11th Edition, Tata McGraw-Hill, 11th Ed, 2017
3. H. K. Dass and Er. RajnishVerma: "Higher Engineerig Mathematics", S. Chand publishing, 3rd edition, 2014.
4. C. Ray Wylie, Louis C. Barrett: "Advanced Engineering Mathematics" , McGraw – Hill
5. **James Stewart: "**Calculus" Cengage publications, 7th edition, 2019.
6. Srimanta Pal & Subobh C Bhunnia: "Engineering Mathematics", Oxford University Press, 3rd Reprint, 2016.
7. Gupta C.B., Singh S.R. and Mukesh Kumar: "Engineering Mathematics for I & II ", McGraw-Hill Education (India) Pvt. Ltd., 2015.
8. **David C Lay:** "Linear Algebra and its Applications", Pearson Publishers, 4th Ed., 2018.
9. **Gareth Williams:** "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6th Ed., 2017.

Additional Study material & e-Books

1.CRC Standard Mathematical Tables and Formulae, 32nd Edition
2.A Student's Guide to the Study, Practice, and Tools of Modern Mathematics- Bindner, Donald
3 .P.N.Wartikar & J.N.Wartikar -Applied Mathematics (Volume I & II) Pune Vidyarthi Griha Prakashan, 7thEdition 1994.
4. Peter V.O'Neil – Advanced Engineering Mathematics, Thomson Brooks/Cole, 7th Edition, 2011.
5. Glyn James – Advanced Modern Engineering Mathematics, Pearson Education, 4th Edition, 2010.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
1. http://nptel.ac.in/courses.php?disciplineID=111
2. http://wwww.khanacademy.org/
3. (MOOCs)
4.http://academicearth.org/
5.VTU EDUSAT Program
6. VTU e-Shikshana Program

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	+ Plus Magazine	https://plus.maths.org/issue44.
2	Mathematics Magazine	www.mathematicsmagazine.com

11.0 Examination Note

Assessment Details (both CIE and SEE)

The weight age 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). 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:

Three Unit Tests each of **20 Marks (duration 01 hour**)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks** (**duration 01 hours**)

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have 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 /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 the subject (**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.
   The students have to answer 5 full questions, selecting one full question from each module

12.0 Course Delivery Plan

Module	Lecture No.	Content of Lecturer	% of Portion
1	1	Evaluation of double and triple integrals	20
	2	Problems	
	3	Evaluation of double integrals by change of order of integration.	
	4	Evaluation of double integrals by changing into polar coordinates	
	5	Evaluation of Double and triple integrals to find the area and volume.	
	6	Beta and Gamma Functions-Properties	
	7	Beta and Gamma Functions- problems	
	8	Relation between Beta and Gamma function	
2	9	Scalar and vector fields	20
	10	Gradient, directional derivatives	
	11	Curl and divergence-physical interpretation	
	12	Solenoidal and Irrotational vector fields	
	13	Scale factors, base vectors	
	14	Cylindrical polar coordinates, Spherical polar coordinates	
	15	Transformation between cartesian and curvilinear systems	
	16	Orthogonality	
3	17	Definition and examples, subspace, linear span	20
	18	Linearly independent and dependent sets	
	19	Basis and dimension	
	20	**Linear transformations**: Definition and examples	
	21	Algebra of transformations, Matrix of a linear transformation. Change of coordinates	
	22	Rank and nullity of a linear operator	
	23	Rank-Nullity theorem	
	24	Inner product spaces and orthogonality.	
4	25	Solution of polynomial and transcendental equations	20
	26	Finite differences: Forward & backward differences	
	27	Newton's forward and backward interpolation formulae	
	28	Problems	
	29	Divided differences- Newton's divided difference formula	
	30	Lagrange's interpolation	
	31	Numerical integration: Simpson's one third rule	
	32	Simpson's three eighth rule	
5	33	Numerical solution of ODE of first order & first degree	20
	34	Taylor's series method & Problems.	
	35	Modified Euler's method & Problems	
	36	Problems	
	37	Runge -Kutta method of fourth order & Problems	
	38	Problems	
	39	Milne's predictor and corrector method	
	40	Problems	

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl. No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment-1: University Questions on Vector Calculus	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 1 of the syllabus	2	Individual Activity.	Book 1, of the reference list. Website of the Reference list
2	Assignment-2: University Questions on Differential equations higher order	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 2 of the syllabus	4	Individual Activity.	Book 1, 2 of the reference list. Website of the Reference list
3	Assignment-3: University Questions on Partial Differential equations	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 3 of the syllabus	6	Individual Activity	Book 1, 2 of the reference list. Website of the Reference list
4	Assignment-4: University Questions on Infinite series	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 4 of the syllabus	8	Individual Activity	Book 1, 2 of the reference list. Website of the Reference list
5	Assignment-5: University Questions on Numerical methods	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 5 of the syllabus	10	Individual Activity	Book 1, 2 of the reference list. Website of the Reference list

14.0 QUESTION BANK

Module-- 1: Integral Calculus

1. Evaluate $\int_{-1}^{1}\int_{0}^{z}\int_{x-z}^{x+z}(x+y+z)dxdydz$
2. Evaluate $\int_{0}^{5}\int_{0}^{x^2}x(x^2+y^2)dxdy$
3. Evaluate $\int_{0}^{1}\int_{0}^{2}\int_{1}^{2}(x^2yz)dxdydz$
4. Evaluate $\int_{0}^{1}\int_{0}^{1}\int_{0}^{y}(xyz)dxdydz$.
5. Change the order of the integration in $I=\int_{0}^{1}\int_{x^2}^{2-x}(xy)dxdy$ & hence evaluate the same.
6. Find the volume bounded by the cylinder $x^2+y^2=4$ & the planes $y+z=4$ & $z=0$
7. Find the volume of the ellipsoid $x^2/a^2+y^2/b^2+z^2/c^2=1$
8. S.T the area between the parabolas $y^2=4ax$ & $x^2=4ay$ is $16/3a^2$
9. Evaluate $\iint_{A}xy\,dxdy$, where A is the domain bounded by x-axis , ordinate x=2a & the curve $x^2=4ay$
10. Evaluate $\int_{0}^{\infty}\int_{0}^{\infty}e^{-(x^2+y^2)}dxdy$, by changing to polar coordinates.
11. Change the order of integration and evaluate $\int_{0}^{\infty}\int_{x}^{\infty}\frac{e^{-y}}{y}dy\,dx$.
12. Find by double integration, the centre of gravity of the area of the cardioid $r=a(1+cos\theta)$

13. Using double integration, find the centre of gravity of a lamina in the shape of quadrant of the curve $\left(\frac{x}{a}\right)^{2/3}+\left(\frac{y}{b}\right)^{2/3}=1$, the density being $\rho = kxy$, where k is constant
14. P.T β(m+n , n)/m= β(m,n+1)/n = β(m,n)/m+n.
15. Prove that $\beta(m,n) = \frac{\Gamma m.\Gamma n}{\Gamma m+n}$.
16. Evaluate $\int_0^1 x^{3/2}(1-x)^{1/2}\,dx$

Module-2:

1. Find div F & curl F if F = □ ($x^3 + y^3 + z^3$-3xyz)
2. If $\emptyset = x^2 + y^2 + z^2$ and $\vec{F}$=$x^2\vec{i}$+$y^2\vec{j}$+$z^2\vec{k}$,then find grad∅,div$\vec{F}$,curl$\vec{F}$
3. Find the value of the constants a,b &c such that the vector field,
4. $\vec{F} = (x + y + az)i + (bx + 2y - z)j + (x + cy + 2z)k$ is irrotational and hence find a scalar
5. If u = $x^2\hat{i} + y^2\hat{j} + z^2\hat{k}$ & v= yzî + xzĵ +yx$\hat{k}$ then prove that $\vec{u}$ X $\vec{v}$ is a Solenoidal vector
6. Prove that div(∅$\vec{A}$) = ∅(div $\vec{A}$) + gra ∅ · $\vec{A}$
7. Prove that curl(grad∅) = 0
8. Prove that div curl F=∇. ∇ X F = 0
9. If u = $x^2\hat{i} + y^2\hat{j} + z^2\hat{k}$ & v= yzî + xzĵ +yx$\hat{k}$ then prove that $\vec{u}$ X $\vec{v}$ is a Solenoidal vector
10. If $\vec{v} = \vec{w}$ X $\vec{r}$, prove that curl $\vec{v} = 2\vec{w}$ where $\vec{w}$ is a constant vector

Module-3:

1. The set w of ordered triads $(a_1, a_2, 0)$, $a_1, a_2 \in F$ is a subspace of $v_3(F)$
2. Prove that the set of all solutions (a, b, c) of the equation $a + b + 2c = 0$ is a subspace of $v_3(R)$
3. Show that the set w of the elements of the vector space $v_3(R)$ of the form $x + 2y, y, x + 3y$: $x, y \in R$ is a subspace of $v_3(R)$
4. Find Null Space, Range, Rank & Nullity of the linear transformation $T: R^2 \to R^3$ defined by $T(x, y) = (x + y, x - y, y)$
5. If $T: R^3 \to R^2$ be a linear transformation defined by $T(x_1, x_2, x_3) = (x_1 - x_2,\ x_1 + x_3)$. Find the rank (T) and Nullity (T).
6. Verify Rank Nullity Theorem for the linear transformation $T: R^3 \to R^3$ defined by $T(x, y, z) = (x - y, 2y + z, x + y + z)$
7. If α and β are orthogonal unit vectors (that is $\{\alpha, \beta\}$ is an orthogonal set), what is the distance α and β
8. Prove that two vectors α and β in a real inner product space are orthogonal iff $\|\alpha + \beta\|^2 = \|\alpha\|^2 + \|\beta\|^2$
9. Two vectors α and β in a complex inner product space are orthogonal iff $\|a\alpha + b\beta\|^2 = \|a\alpha\|^2 + \|b\beta\|^2$ for all pairs of scalar a & b.
10. If α and β are vectors in a real inner product space and if $\|\alpha\| = \|\beta\|$ then $\alpha - \beta$ and $\alpha + \beta$ are orthogonal

Module-4:

1. Find the real root of the equation $x\log_{10}x$ =1.2 by Regula-Falsi method correct to four decimal places.
2. Find by Newton's method, the real root of the equation 3x = cosx +1.
3. Using the Newton's Raphson method, find a root of the following equations correct to the three decimal
4. Places. i) 3sin x – 2x+5 = 0 near 3, ii) x sin x + cos x = 0 which is near x = π
5. Find by Newton's method, the root of the equation cos x = x e^x.
6. Use Newton-Raphson method to find a real root of the equation logx − cosx = 0

7. By applying Weddle's Rule evaluate $\int_0^1 \frac{x}{1+x^2}dx$ by considering 7 ordinates. Hence find the value of $log_e 2$

8. Evaluate $\int_0^1 \frac{1}{1+x}dx$, by using Simpson 1/3 rd rule, considering seven ordinates. Hence deduce the value of $log_e 2$.

9. Find the interpolating formula that approximates to the function described by the following table

x	0	1	2	5
y	2	3	12	147

10. Find 'y' when x= 0.26 using appropriate interpolation formula to the following data,

X	0.10	0.15	0.20	0.25	0.30
Y	0.1003	0.1511	0.2027	0.2553	0.3093

11. If y(5)=150 , y(7)=392 , y(11)=1492 , y(13)=2366 ,y(17) = 5202 then find y(9) by using Lagrange's Formula

12. Apply Lagrange's Inverse interpolation formula to find a root of the equation f(x)=0 given that

$f(30) = -30,\ f(34) = -13,\ f(38) = 3,\ f(42) = 18.$

13. Use Newton's divided difference formula to find f(4) given

x	0	2	3	6
y	- 4	2	14	158

14. The following table gives the distances in nautical miles of the visible horizon for the given heights in feet above the earth's surface

x:height	100	150	200	250	300	350	400
y:distance	10.63	13.03	15.04	16.81	18.42	19.90	21.27

Find the values of y when x=218 feet and 410 feet

15. From the following table, estimate the number of students who obtained marks between 40 & 45

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

16. In the table below the value of y are conjugative terms of a series of which 23.6 are the 6^{th} term. Find The first & tenth terms of the series

x	3	4	5	6	7	8	9
y	4.8	8.7	14.5	23.6	36.2	52.8	73.9

17. Given the values

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Find f(15) and f(19)

18. Use Newton's divided difference formula to find f(x) given the data

x	0	2	3	6
f(x)	-4	2	14	158

19. Given the values

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Evaluate f (9) using divided difference formula for unequal intervals.

20. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's 1/3 rd rule taking four equal strips

21. If y(1) =3,y(3) = 9, (4) = 30,y(6) =132, Find Lagrange's interpolation formula & hence find y at x=5.

22. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using

    i) Simpson's 1/3 rd rule , ii) Simpson's 3/8th rule, iii) Weddle's rule compare with its actual value.

23. Use Simpson's 1/3 rd rule to find $\int_0^{0.6} e^{-x^2}\,dx$ by taking seven ordinates.

24. Using Simpson's 3/8th rule , evaluate $\int_0^{0.3} \sqrt{1-8x^3}\,dx$ by taking 7 ordinates.

25. Integrate numerically $\int_0^{\frac{\pi}{2}} \sqrt{cos\theta}\,d\theta$

Module-5:

1. Solve $\frac{dy}{dx} = x^2y - 1$with $y(0) = 1$ using Taylor's series method and find $y(0.1)$ consider up to 4th degree terms.
2. Use Runge Kutta fourth order method to solve $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$ with $y(0) = 1$ and find y for $x =$ 0.2 and 0.4 take $h = 0.2$.
3. Given$\frac{dy}{dx} = xy + y^2$,$y(0) = 1, y(0.1) = 1.1169$, $y(0.2) = 1.2773, y(0.3) = 1.5049$ $find$ $y(0.4)$ accurate up to three decimal places using Milne's predictor corrector method.
4. Applying R-K method to find an approximate value of y for x=0.2 in steps of 0.1 of $\frac{dy}{dx} = x + y^2$ given that $y = 1$ when $x = 0$.
5. Given $\frac{dy}{dx} = x^2(1 + y)$ & $y(1) = 1, y(1.1) = 1.233, y(1.2) = 1.548, y(1.3) = 1.979$. Evaluate $y(1.4)$ by Adams Bash Fourth method
6. Employ Taylor's series method to find an approximate solution correct to fourth decimal places for the following initial value problem at x=0.1 & 0.2 $\frac{dy}{dx} = 2y + 3e^x, y(0) = 0$.
7. Using Milne's predictor corrector method find y where x=0.8 given $\frac{dy}{dx} = x - y^2$, $y(0) = 0$, $y(0.2) = 0.02, y(0.4) = 0.0795, y(0.6) = 0.1762$.Applying corrector formula twice.
8. Employ R-K method of 4rth order to solve the equation$\frac{dy}{dx} = 3x + y/2, y(0) = 1$ at $x = 0.2$ taking step length$h = 0.1$.
9. Solve the differential equation $\frac{dy}{dx} = x^2 + y^2$ given $y(0) = 1$ to find the value of $y(0.1)$ by using Taylor's series method of order.
10. Using modified Euler's method ,solve the equation $\frac{dy}{dx} = \frac{1}{x+y}$, $y(0) = 1$ in steps of 0.5 at $x = 1$
11. Using Taylor's series method to find y at the point $x = 0.1$ & $x = 0.2$ given that $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 1$
12. From the data given below find y at $x = 1.4$ using Milne's predictor corrector method $y' = \frac{x^2+y}{2}$

x	1	1.1	1.2	1.3
y	2	2.2156	2.4649	2.7514

Prepared by	Checked by		
Dr. S. L. Patil Prof. I. N. Kambar Prof. S. A. Patil	Dr. S. L. Patil	HOD	Principal

Subject Title	**Applied Chemistry for Computer Science & Engineering stream**		
Subject Code	**BCHES202**	**CIE Marks**	50
		SEE Marks	50
Number of Lecture Hrs/ Week	2+2+2	**TotalMarks**	100
Total Number of Lecture Hrs	40hoursTheory+ 10to12 Lab slots	**Exam Hours**	03
CREDITS – 04			

FACULTY DETAILS:		
Name:1) Dr. M. S. Hanagadakar 2) Dr. S. J. Walki 3) Dr. Tanuja S.B.	**Designation:**1) Associate Prof. 2) Assistant Prof. 3) Assistant Prof.	**Experience:**1) 20 Years 2) 7 Years 3)6.5
No. of times course taught: 1) 31 (including Present) 2) 14(including Present 3) 02 (including Present)	**Specialization:**1) Physical Chemistry 2) Organic Chemistry 3) Physical Chemistry	

1.0 Prerequisite Subjects:

Students should have the basic knowledge chemistry and Basic Science.

Sl. No	Branch	Semester	Subject
01	CSE	II	Chemistry for CSE stream

2.0 Course Objectives

To provide students with knowledge of engineering chemistry for building technical competence in industries, research and development in the following fields

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

3.0 Course Outcomes

On completion of this course, students will have knowledge in:

	Course Outcome	POs	RBT Levels
CO1	Identify the terms and processes involved in scientific and engineering applications	1,2,3,& 7	L3
CO2	Explain the phenomena of chemistry to describe the methods of engineeringprocesses	1,2,3, & 7	L1 &L2
CO3	Solve for the problems in chemistry that are pertinent in engineering applications	1,2,3, & 7	L3
CO4	Apply the basic concepts of chemistry to explain the chemical properties and processes	1,2,3, & 7	L3
CO5	Analyze properties and processes associated with chemical substances inmultidisciplinary situations	1,2,3, & 7	L1&L2
Total Hours of instruction		**100**	

4.0 Course Content

MODULE 1: Sensors and Energy

Sensors: Introduction, working principle and applications of Electrochemical sensors, Conductometric sensors, and Optical sensors. Sensors for the measurement of dissolved oxygen (DO). Electrochemical sensors for the pharmaceuticals, and hydrocarbons. Electrochemical gas sensors for SOx and NOx. Disposable sensors in the detection of biomolecules and pesticides.

Energy Systems: Introduction to batteries, construction, working and applications of Lithium ion and Sodium ion batteries. Quantum Dot Sensitized Solar Cells (QDSSC's)- Principle, Properties and Applications.

Self-learning: Types of electrochemical sensor, Gas sensor - O2 sensor, Biosensor - Glucose sensors.

MODULE 2: Materials for Memory and Display Systems

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

Display Systems: Photoactive and electroactive materials, Nanomaterials and organic molecules used in optoelectronic devices. Liquid crystals (LC's) - Introduction, classification,properties and application in Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light Emitting Diodes (QLED's). Self-learning: Properties and functions of Silicon (Si), Germanium (Ge), Copper (Cu), Aluminum (Al), and Brominated flame retardants in computers.

Self-learning: PropertiesandfunctionsofSilicon(Si),Germanium(Ge),Copper(Cu),Aluminium(Al),andBrominatedflameretardantsincomputers

MODULE 3: Corrosion and Electrode System

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

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

Analytical Techniques: Introduction, principle and instrumentation of Conductometry; its application in the estimation of weak acid. Potentiometry; its application in the estimation of iron.

Self-learning: IR and UV- Visible spectroscopy

MODULE 4: Polymers and Green Fuels

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

Green Fuels: Introduction, construction and working of solar photovoltaic cell, advantages, and disadvantages. Generation of energy (green hydrogen) by electrolysis of water and its advantages.

Self-learning: Regenerative fuel cells

MODULE 5: Sensors in Analytical Techniques

E-Waste: Introduction, sources of e-waste, Composition, Characteristics, and Need of e-waste management. Toxic materials used in manufacturing electronic and electrical products, health hazards due to exposure to e-waste. Recycling and Recovery: Different approaches of recycling (separation, thermal treatments, hydrometallurgical extraction, pyrometallurgical methods, direct recycling). Extraction of gold from E-waste. Role of stake holders in environmental management of e-waste (producers, consumers, recyclers, and statutory bodies).

Self-learning: Impact of heavy metals on environment and human health.

A – Demonstration (any two) offline/virtual:

A1. Chemical Structure drawing using software: ChemDraw or ACD/ChemSketch
A2. Determination of strength of an acid in Pb-acid battery
A3: Synthesis of Iron-oxide Nanoparticles
A4. Electrolysis of water

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

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

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

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

D – Open Ended Experiments (any two):

D1: Evaluation of acid content in beverages by using pH sensors and simulation.
D2. Construction of photovoltaic cell.
D3. Design an experiment to Identify the presence of proteins in given sample.
D4. Searching suitable PDB file and target for molecular docking

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	II	Nano technology, Water chemistry, CSE study, (Common to all Engineering subjects)	Introduction to fundamental aspects of chemistry and Engineering chemistry in I/II semester Students will learn the laboratory and practical techniques needed for the later years of the course. Students have to choose and elective paper on applied chemistry as well.

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Generate electricity in the most efficient fashion to preserve our natural resources and protect the environment.
02	Improve mining techniques, so they minimize environmental damage and cost less.
03	Manufacture petrochemicals, making them cheaper and safe for people to use Create renewable fuels and energy sources to replace coal, petrol and gas. Refine oil into petrol, keeping petrol prices low and improving petrol quality so it doesn't pollute the air.
04	Produce safe drinking water from rivers, groundwater or the sea for city, rural and remote aboriginal communities.
05	Safely treat toxic hazardous industrial wastes so their disposal does not harm the environment
06	Nanotechnology (an emerging scientific area utilizing very small particles for diverse applications)
07	Semi-conductors & microelectronics (many chemical engineers work in these areas)

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Numerical problems discussion
02	NPTEL	Each module/ Chapter presentation

8.0 Books Used and Recommended to Students

Text Books

1. B. S. Jai Prakash, R. Venigopal, Shivakumarraiah, PushpaIyengar, Chemistry for Engineering Students, Subhas Stores (Bangalore), 2014
2. R. V. Gadag and A. N. Shetty, Engineering Chemistry, IK International Publishing House, New Delhi, Third Edition 2014
3. P.C. Jain & Monica Jain. **"Engineering Chemistry"**, DhanpatRai Publications, New Delhi (2015 Edition).
4. S. S. Dara, A textbook of Engineering Chemistry, 10th Edition, S Chand & Co., Ltd., New Delhi, 2014.
5. Physical Chemistry, by P. W. Atkins, Oxford Publications (Eighth edition-2006).

Reference Books

1. O.G.Palanna,"Engineering Chemistry",Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint.
2. G.A.Ozin& A.C. Arsenault, "NanochemistryA Chemical Approach to Nanomaterials", RSC publishing, 2005.
3. V. R. Gawariker, N V. Viswanathan, JayadevSreedhar, Polymer Science, New Age International (P) Ltd., New Delhi, 2nd edition 2015.
4. M.G.Fontana., "Corrosion Engineering", Tata McGraw Hill Publishing Pvt. Ltd. New Delhi.
5. Engineering Chemistry by S.S Dara, S.S Umare., S. Chand & Co. Pvt Ltd. New Delhi.
6. Engineering Chemistry by P.R.Vijayasarathy, Second Edition, PHI Learning Pvt. Ltd. New Delhi.
7. Puri B R Sharma L R and Madan S Pathania, Principles of Physical Chemistry, Vishal publishing Co., Edition 2004
8. ArunBahl, B. S. Bahl, A Text Book of Organic Chemistry, S Chand and Co. Ltd., First Edition 2005
9. Michael F. Ashby, Paulo J. Ferreira, Daniel L. Schodek, Nano Materials, Nanotechnologies and Design, Elsevier India Pvt. Ltd., 2011.
10. T Pradeep, NANO: The Essentials, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012, 7th Reprint
11. Fred W. Billmeyer, Text Book of Polymer Science, Wiley India (P) Ltd., Third Edition 2011

Additional Study material & e-Books

1. Introduction to Chemistry - Tracy Poulsen; 250 pages; ISBN-13: 9781478298601; ISBN-10: 147829860X
2. Elementary Applied Chemistry * - Lewis BenajahAllyn; 152 pages; Publisher: Ginn and Company 1912; ISBN/ASIN: 1112247610.
3. Kuriocose, J C and Rajaram, J, Engineering Chemistry, Volume I/II, Tata McGraw- Hill Publishing Co. Ltd.New Delhi, 2000

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

1.http://www.mooc-list.com/course/chemistry-minor-saylororg
2. https://www.canvas.net/courses/exploring-chemistry
3. http://nptel.ac.in/courses/122101001/
4.http://www.nptelvideos.in/2012/11/engineering-chemistry-1.html

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	International Journal of Engineering Science	https://www.journals.elsevier.com/international-journal-of-engineering-science
2	International Journal of Engineering Trends and Technology	http://ijettjournal.org/
3	Nanotechnology, Science and Applications	https://www.dovepress.com/nanotechnology-science-and-applications-journal

11.0 Examination Note

Assessment Details (both CIE and SEE)

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

Continuous Internal Evaluation(CIE):

Two Unit Tests each of20 Marks (duration 01 hour)

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

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

Two assignments each of 10 Marks

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

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

CIE for the practical component of the Integrated Course

1. 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. common/repeated for any of the methods of the CIE. Each method of CIE should have a different
2. 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**.
3. The laboratory test **(duration 02/03 hours)** at the end of the 14th /15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and **scaled down to 05 marks.**
4. Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **20 marks**.

Semester End Examination (SEE):

SEE for IC

Theory SEE will be conducted by University as per the scheduled time table, with common questionpapers 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 thepractical portion will have a CIE component only. Questions mentioned in the SEE paper shallinclude questions from the practical component).

SCHEME OF EXTERNAL EXAMINATION:

Ten main questions to be set in question paper. Each main question will carry 16 marks. Student has to answer either 1 or 2 main question. It will continue up to 10th question.

Module I– Question 1(a,b,c) or 2(a,b,c) = 20Marks
Module II – Question 3(a,b,c) or 4(a,b,c) = 20Marks
Module III– Question 5(a,b,c) or 6(a,b,c) = 20Marks
Module IV – Question 7(a,b,c) or 8(a,b,c) = 20Marks
ModuleV – Question 9(a,b,c) or 10(a,b,c) = 20Marks
Total = 100Marks

INSTRUCTION FOR ENGINEERING CHEMISTRY (22CHEE12/22) EXAMINATION

1. The total exam duration is 3 hours.
2. Use black ink pen for writing examination
3. Drawing should be drawn from dark pencil.
4. Read the questions carefully.
5. Answer the questions up to the point.

Passing standard:

1. 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.
2. 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.

12.0 Course Delivery Plan

Module No.	Lecture No.	Content of Lecture	% of Portion
1	1	Introduction, working principle and applications of Electrochemical sensors	20.0
	2	Conductometric sensors, and Optical sensors.	
	3	Sensors for the measurement of dissolved oxygen (DO). Electrochemical sensors for the pharmaceuticals, and hydrocarbons.	
	4	Electrochemical gas sensors for SOx and NOx.	
	5	Disposable sensors in the detection of biomolecules and pesticides.	
	6	Introduction to batteries, construction, working and applications of Lithium ion	
	7	Sodium ion batteries.	
	8	Quantum Dot Sensitized Solar Cells (QDSSC's)- Principle, Properties and Applications.	
2	1	Introduction, Basic concepts of electronic memory	20.0
	2,	History of organic/polymer electronic memory devices	
	3	Classification of electronic memory devices, types of organic memory devices (organic molecules, polymeric materials).	

	4	Photoactive and electroactive materials	
	5	Nanomaterials and organic molecules used in optoelectronic devices	
	6	Liquid crystals (LC's) - Introduction, classification,	
	7	properties and application in Liquid Crystal Displays (LCD's).	
	8	Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light Emitting Diodes (QLED's).	
3	1	Introduction, electrochemical theory of corrosion, types of corrosion-differential metal and differential aeration.	**20.0**
	2	Corrosion control - galvanization, anodization and sacrificial anode method.	
	3	Corrosion Penetration Rate (CPR) - Introduction and numerical problem.	
	4	Introduction, types of electrodes. Ion selective electrode – definition, construction, working and applications of glass electrode.	
	5	Determination of pH using glass electrode. Reference electrode - Introduction, calomel electrode – construction, working and applications of calomel electrode.	
	6	Concentration cell– Definition, construction and Numerical problems.	
	7	Introduction, principle and instrumentation of Conductometry; its application in the estimation of weak acid.	
	8	Potentiometry; its application in the estimation of iron.	
4	1	Introduction, Molecular weight - Number average, weight average and numerical problems.	**20.0**
	2	Conducting polymers – synthesis and conducting mechanism of	
	3	polyacetylene and commercial applications	
	4,5	Preparation, properties, and commercial applications of graphene oxide	
	5,6	Introduction, construction and working of solar photovoltaic cell, advantages, and disadvantages.	
	7,8	Generation of energy (green hydrogen) by electrolysis of water and its advantages.	
5	1	Introduction, sources of e-waste,	**20.0**
	2	Composition, Characteristics, and Need of e-waste management.	
	3	Toxic materials used in manufacturing electronic and electrical products	
	4	health hazards due to exposure to e-waste.	
	5	Recycling and Recovery: Different approaches of recycling (separation thermal treatments, hydrometallurgical extraction, pyrometallurgica methods, direct recycling).	
	6	Extraction of gold from E-waste	
	7	Role of stake holders in environmental management of e-waste (producers, consumers, recyclers, and statutory bodies).	

13.0 QUESTION BANK

Module-I Sensors and Energy Systems

1. Define electrochemical sensor. Explain working and application of electrochemical sensor.
2. Write short note on optical sensor.
3. Explain Sensors for the measurement of dissolved oxygen
4. Explain electrochemical sensor detection for SO_2 gas
5. Explain sensor used fordetection of biomolecules and pesticides
6. Explain construction and working of Lithium-ion Battery
7. Write short note on Quantum Dot Sensitized Solar Cells

MODULE 2: Materials for Memory and Display Systems

1. Define electronic memory. Explain classification electronic memory device.
2. Define memory device. Explain working of electronic memory device
3. Define liquid crystal. Explain classification liquid crystal.
4. Explain Properties and application of Organic Light Emitting Diodes (OLED's)
5. Explain construction and working of Organic Light Emitting Diodes

MODULE 3: Corrosion and Electrode System

1. Define corrosion. Explain electrochemical theory of electrochemical theory of corrosion.
2. Explain differential metal corrosion with an example.
3. Write short note on pitting corrosion.
4. Define galavanisation. Explain process.
5. Explain construction working of ion selective electrode
6. Explain Determination of pH using glass electrode.
7. Write short note on potentiometric titration

MODULE 4: Polymers and Green Fuels

1. Define polymer. Explain synthesis and conducting mechanism of polyacetylene
2. Explain properties, and commercial applications of graphene
3. Define solar cell. Explain construction and working of photovoltaic cell.
4. Define green fuel. Explain electrolysis of water
5. Explain advantages and disadvantages of solar cell.

MODULE 5: E-Waste Management

1. Define E-waste. Explain sources of e-waste.
2. Explain sources and characteristic of E-waste.
3. Explain effects of e-waste on health.
4. Explain extraction gold from e-waste
5. Explain role of producers, consumers, recyclers, and statutory bodies

14.0 University Result

Examination	S+	S	A	B	C	D	E	F	% Passing

Prepared by	Checked by		
Prepared by 1) **Dr. M. S. Hanagadakar** 2) **Dr. S. J. Walki** 3) **Dr. Tanuja S.B.**	**HOD**(Chemistry) **(Dr. M. S. Hanagadakar)**	**HOD**	**Principal**

Subject Title	**Computer Aided Engineering Drawing**		
Course Code	**22CAED203**	**CIE Marks**	50
Number of Lecture Hrs / Week	2:0:2:0	**SEE Marks**	50
Total Number of Lecture Hrs	40	**Exam Hours**	03
Credits	03		

FACULTY DETAILS:		
Name: **Prof. D.N. INAMDAR**	**Designation:** Asst .Professor	**Experience:**21Years
No. of times course taught:15	**Specialization:** Tool Design	

FACULTY DETAILS:		
Name: Prof. GIRISH M. ZULAPI	**Designation:** Asst .Professor	**Experience:** 15 Years
No. of times course taught: 04	**Specialization:** Product Design and Manufacturing	

FACULTY DETAILS:		
Name: **Prof. P.M. KOKITAKAR**	**Designation:** Asst .Professor	**Experience:**05Years
No. of times course taught:00	**Specialization:** Machine Design	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	High School	8, 9,10th Std.	Geometry
02	PU Science	I and II year	Trigonometry, Mathematical Curves and Analytical Geometry.

2.0 Course 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 visualise engineering components

3.0 Course Outcomes

Having successfully completed this course, the student will be able to draw and use modeling software's to generate

	Course Outcome	Cognitive Level	Pos
CO1	Draw and communicate the objects with definite shape and dimensions	U	PO1, PO5,
CO2	Recognize and Draw the shape and size of objects through different views	U	PO1, PO5,
CO3	Develop the lateral surfaces of the object	U	PO1, PO5,
CO4	Create a 3D views using CAD software.	U	PO1, PO5,

CO5	Identify the interdisciplinary engineering components or systems through its graphical representation.	U	PO1, PO5,
Total Hours of instruction		**40**	

4.0 Course Content

MODULE-1

Introduction: ***for CIE only***

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales.

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

Orthographic Projections of Points, Lines and Planes:

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

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

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

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

MODULE-2

Orthographic Projection of Solids:

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

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

MODULE – 3

Isometric Projections:

Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones andspheres. 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 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 andrectangular 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 todimensions etc

Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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.

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	III	Computer aided Machine Drawing	Modeling and Assembly drawing of Machine Parts
02	V/VI	Design of Machine Elements I/II	Fasteners, Keys and Joints, Rivets and Assembly drawings.
03	VIII	Project work	Part Modeling and its detailed drawings,

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Industrial drawings and design of various components in all engineering disciplines including Mechincal Engg.
02	Model creation for Stress and thermal analysis of parts modeled
03	May be contribute as Developer of a software applications in industrial mechanical engineering needs.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Lettering, Line, Methods of dimensioning, Animated videos, online discussion on the topics as and when required to students.
02	NPTEL	Videos of machine Assembly drawings and drawing standards

8.0 Books Used and Recommended to Students

Text Books

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

Reference Books

- *Bhattacharya S. K.*, Electrical Engineering Drawing, New Age International publishers, second edition 1998, 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*, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.
- *K. R. Gopalakrishna, & Sudhir Gopalakrishna*: Textbook Of Computer Aided Engineering Drawing, 39thEdition, Subash Stores, Bangalore,2017

Additional Study material & e-Books

COMPUTER AIDED ENGINEERING DRAWING BY N.H.Ramaiah and Rajshekar. NEW AGE International publication 2008-09

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
1) https://hareeshang.wordpress.com/tutorials/caed/
2) http://m.noteboy.in/vtuflies/machine%20drawing.pdf
3) https://www.edx.org/school/iitbombayx?utm_source=bing&utm_medium=cpc&utm_term=iit-bombay&utm_campaign=partner-iit-bombay
4) http://www.vlab.co.in/

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	Journal of Aircraft	http://arc.aiaa.org/loi/ja
2	International Journal of Solids and Structures	http://www.sciencedirect.com/science/journal/00207683
3	Journal of Manufacturing Science and Engineering	http://manufacturingscience.asmedigitalcollection.asme.org/issue.aspx?journalid=125&issueid=27340
4	American Fastener Journal	http://www.fastenerjournal.com/

11.0 Examination Note

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 mark 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 total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation (CIE)

- CIE shall be evaluated for max marks 100. Marks obtained shall be accounted for CIE final marks, reducing itby 50%.
- CIE component should comprise of Continuous evaluation of Drawing work of students as and when the Modules are covered on the basis of belowdetailed weightage.

Module	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Preparatory 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
Total	**100**	**80**	**20**
Consideration of Class work		**Total of [(a) + (b)] = 100 Scale down to 30 marks**	

- 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 **20Mark**s.
- 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 by50%
- 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 theexaminers.
- Scheme of Evaluation: *To be defined by the examiners jointly and the same shall be submitted to the university along with questionpaper.*

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 withoutsketch.*

Module	**Max. MarksWeightage**	**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
Total	**100**	**80**	**20**
Consideration of SEE Marks	**Total of (a) + (b) ÷ 2 = Final SEE marks**		

12.0 Course Delivery Plan

Module No.	Lecture No.	Content of Lecture	Teaching Method	Laboratory Component	%of Portion
I	1	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	**Chalk & Talk**	**Power Point Presentation & Demo using solid edge drafting software of one illustrative example**	**20**
	2	**Orthographic Projections of Points, Lines and Planes:** **Orthographic Projections of Points:** Introduction to Orthographic projections Orthographic projections of points in 1st and 3rd quadrants.			
	3	**Problems on projection of points.**			
	4	**Orthographic Projections of Lines :** Problems on Orthographic projections of lines. (Placed in First quadrant only).			
	5	Problems on Orthographic projections of lines. (Placed in First quadrant only).			
	6	**Orthographic Projections of Planes:** Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon and circular laminae. (Placed in First quadrant only using change of position method).			
	7	Orthographic projections of planes viz rectangle, pentagon			
	8	Orthographic projections of planes viz hexagon and circular laminae.			
II	9	**Orthographic Projections of solids:**	**Chalk**	**Lab session**	

		Introduction, definitions Orthographic projection of right regular solids **(Solids Resting on HP only):** Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes, &Tetrahedron.	**& Talk**	**on sketching and computer aided drafting on projection of solids.**	
	10	Position of solids with reference to planes of projections considering its base, face, axis, base edge, face edge, base corner etc.			
	11	Tips to draw projection of solids with an example with change of position of method			
	12	Projection of triangular, square and rectangular pyramids-variety of problems will be solved			**20**
	13	Projection of pentagonal, hexagonal pyramids – variety of problems will be solved.			
	14	Lab session on sketching and computer aided drafting on projection of solids on triangular, square, pentagonal and hexagonal pyramids			
	15	Problems on Projection of cones and cylinders			
	16	Problems on projection of prisms – square, pentagonal, hexagonal prisms			
	17	Projections of Frustum of cone, pyramid & truncated sphere (For CIE only).			
	18	Solution of problems from VTU question papers			
III	19	**Isometric Projections :** Introduction, Isometric scale, Isometric projection of simple plane figures,	**Chalk & Talk**	**PowerPoint Presentation & Demo using solid edge drafting software of one illustrative example**	**20**
	20	Isometric projection of hexahedron(cube), right regular prisms,			
	21	Isometric projection of pyramids, cylinders			
	22	Isometric projection of cones, spheres			
	23	Isometric projection of combination of two simple solids			
	24	Conversion of given Isometric/ pictorial views to orthographic views of simple objects.			
	25	**Introduction to Conversion of simple isometric drawings into orthographic views.** Illustrative example on it.			
	26	Two simple Problems on applications of Isometric projections of simple objects / engineering components.			
IV	27	**Development of Lateral Surfaces of Solids:** Introduction to section planes and sectional views.	**Chalk & Talk**	**PowerPoint Presentation & Demo using solid edge drafting software of one illustrative**	**20**
	28	Development of lateral surfaces of right regular prisms,			
	29	Development of lateral surfaces of right cylinders, pyramids,			
	30	Development of lateral surfaces of cones resting with base on HP only.			
	31	Development of their frustums and truncations.			

	32	Problems on applications of development of lateral surfaces like, funnels and trays.		**example**	
	33	Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct.			
V	33	Multidisciplinary Applications & Practice (For CIE Only): Free hand Sketching; True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc		**PowerPoint Presentation & Demo using You tube tutorials/Relevant modeling drafting softwares**	**20**
	34	Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains,			
	35	Ratchets, two wheeler cart & Four wheeler carts to dimensions etc			
	36	Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic power distribution system uses suitable software			
	37	Electronics Engineering Drawings- Like, Simple Electronics Circuit Drawings.			
	38	Basic Building Drawing; Like, Architectural floor plan, basic foundation drawing,			
	39	steel structures- Frames, bridges, trusses using Auto CAD or suitable software			
	40	Graphs & Charts: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.			

13.0 Assignments, Pop Quiz, Mini Project, Seminars

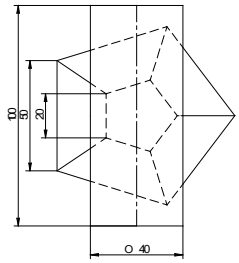
Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: University Questions on Projection of Points	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	2	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
2	Assignment 2: University Questions on Projection of lines	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	4	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
3	Assignment 3: University Questions on PROJECTION OF PLANES .	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	6	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference

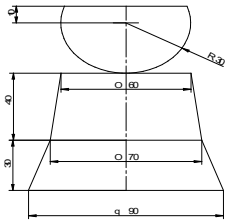
						list
4	Assignment 4: University Questions on PROJECTION OF SOLIDS	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 2 of the syllabus	10	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
5	Assignment 5: University Questions on Isometric Projections	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 3 of the syllabus	14	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
6	Assignment 6: University Questions on PROJECTIONS ON Developments	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 4 of the syllabus	12	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
7	Assignment 7: Multidisciplinary Applications & Practice :	Students understand application of engineering drawing in all engineering streams with one illustrative example.	Module 5 of the syllabus	15	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, and tutorial websites of the reference list.

14.0 Assignment Questions

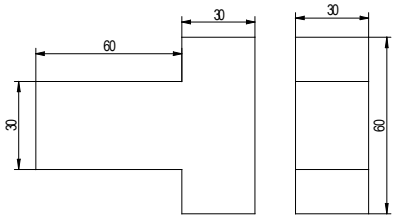
Assignment No	Questions	Marks
I	1. Draw the projection of the following points on the same XY line, keeping convenient distance between each projector. Name the Quadrants in which they lie. a. A - 30 mm above HP & 35 mm in front of VP. b. B - 35 mm above HP & 40 mm behind VP. c. C - 40 mm above HP & on VP. d. D - 35 mm below HP & 30mm in front of VP. 2. A point G is 25mm below HP & situated in the third quadrant its shortest distance from XY line is 45 mm. Draw its projections and find its distance from VP. 3. A point S is in the first quadrant and equidistance of 50 mm from all the three principle planes Draw the projection of the point. Draw all the three views of the point. 4. A point P is 30mm in front of VP, 40mm above HP and 50mm from RPP. Draw its projections. 5. A point is 35mm below HP, 20mm behind VP and 25mm behind/in front/ from RPP. Draw its projections and name the side view. 6. A point is 35mm below HP, 15mm behind VP & 25mm behind/in front/from RPP. Draw the projection and name the side view.	15 15 15 15 15 15 15
II	1. A line AB has its end A 20 mm above the HP and 30 mm in front of the VP. The other end B is 60 mm above the HP and 45mm in front of VP. The distance	

	between end projectors is 70 mm. Draw its projections. Determine the true length and apparent inclinations.	15
	2. The top view pq of a straight line is 70 mm and makes an angle of 60 with XY line. The end Q is 10 mm infront of VP and 30 mm above the HP. The difference between the distances of P and Q above the HP is 45 mm. Draw the projections. Determine its true length and true inclinations with HP and VP.	15
	3. A line has its end A 10 mm above Hp and 15 mm infront of VP. The end B is 55 mm above HP and line is inclined at 30 to HP and 35 to VP. The distance between the end projectors is 50 mm. Draw the projections of the line. Determine the true length of the line and its inclinations with VP.	15
	4. A straight line PQ inclined at 40° to VP has pq = 60mmand p'q'=50mm. The end P is both in HP and VP, and 40 mm to the right of left profile plane. a) Draw the projections of the straight line PQ b) Draw the true length and true inclination with HP. c) Draw the profile view of the straight line. d) Find the position of the end Q with HP and VP.	15
	5. Draw the projections of line PQ and find the true length and inclinations when the line is inclined at 30° to the HP and 45° to the VP. The line is having one of its end 15mm above HP and 20mm in front of VP. The distance between the end projectors on the XY line is 60mm.	15
	6. A straight line PQ 80mm long appears to a length of 50mm and inclined at 30° to xy line in its side view. Draw its projection when its end point P is 15mm above HP and 60mm in front of VP. Point Q is nearer to VP than P.	15
	7. Draw the projections of a line PQ and find its apparent lengths, true length and true inclination with HP when the line PQ has its end P 25mm above HP and 20mm in front of VP. The distance between the end projectors of the line when measured parallel to the line of intersection of the HP & VP is 60mm. The end Q is 50mm above the HP and the line is inclined at 30° to the VP.	15
III	1. An equilateral triangular lamina of 25mm side lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 60°. The edge on which it rests is inclined to VP at 60°. Draw the projections.	20
	2. An equilateral triangular lamina of 25mm side lies on one of its sides on HP. The lamina makes 45° with HP and one of its medians is inclined at 40° to VP. Draw its projections.	20
	3. A triangular lamina o f25mm sides rests on one of its corners on VP such that median passing through the corner on which it rests is inclined to HP at 30° and draw its projections.	20
	4. A triangular plane figure of sides 25mm is resting onHP with one of its corners, such that the surface of the lamina makes an angle of 60° with HP. If the side opposite to the corner on which the lamina rests makes an angle of 30° with VP, draw the top and front views in this position.	20
	5 A triangular plane lamina of sides 25mm is resting on HP with one of its corners touching it, such that the side opposite to the corner on which it rests is 15mm above HP and makes an angle of 30° with VP. Draw the top and front views in this position. Also determine the inclination of the lamina to the reference plane.	20
	6. A pentagonal lamina having edges 25mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30 to HP and 45 VP. Draw the top and front views of the lamina.	20
	7. A hexagonal lamina of 30mm sides rests on HP with one of its corners touching VP and surface inclined at 45 to it. One of its edges is inclined to HP at 30 . Draw the	

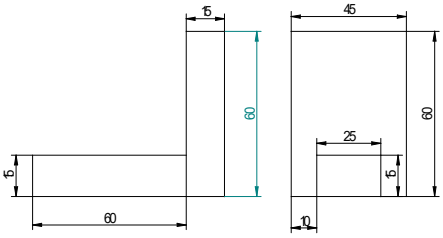
	front and top views of the lamina in its final position.	
IV	1. A square prism 35mm sides of base and 60mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 and to VP at 30 . 2. A pentagonal prism 25mm sides of the base and 60mm axis length rests on HP on one of its edges of the base. Draw the projections of the prisms when the axis is inclined to HP at 40 and VP at 30 3. A hexagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests makes equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 and appears to be inclined to VP at 45 . 4. A hexagonal prism 25mm sides of base and 50mm axis length is suspended freely from a corner of its base. Draw the projections of the prism when the axis appears to be inclined to VP at 45 . 5. A square pyramid 35mm sides of base and 60mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45 and VP at 30 . 6. A hexahedron of 30mm sides is resting on one of its corners on HP such that one of its solid diagonals is perpendicular to VP. Draw the projections of the solid. 7. A cone of base Φ 40mm axis length 50mm is resting on HP on a point on the circumference of its base such that its apex is at 40mm above the HP and its top view of the axis is inclined at 60 to VP. Draw the top and front views of the solid. Also, determine the inclinations of the axis when the base is nearer to the observer.	20 20 20 20 20 20
V	1. Isometric projection of hexahedron (cube), right regular prisms, pyramids with illustrative examples. 1. Isometric projection of cylinders, cones, spheres, cut spheres with illustrative examples. 2. Isometric projection of combination of solids – two solids and three solids with illustrative examples from VTU question bank . 3. Lab session on sketching and computer aided drafting of above combination of solids. 4. The following fig shows the top view of the cylinder which is centrally mounted on a frustumof pentagonal pyramid of 60 mm height. Draw the isometric projection of the combination of solids  5. Following fig shows the front view of the combination of solids consisting a cut sphere and frustums of a cone and a square pyramid. Draw the isometric projections of the combination of solids.	



8 . Following fig shown the front and side views of the solid. Draw the isometric projection of the solid.



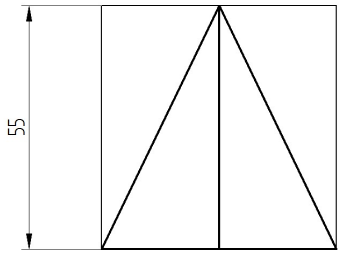
9 .Following fig shows the front and side views of the solid. Draw the isometric projection of the solid



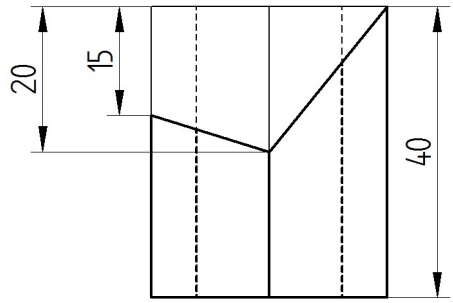
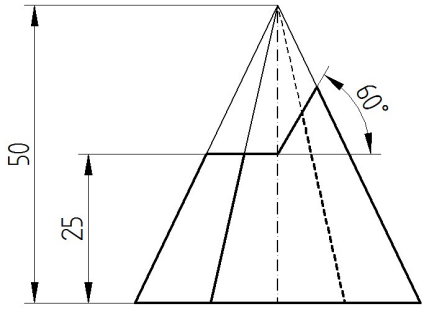
VI

1.A square prism of base side 40mm and axis length 65mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 600 to HP and perpendicular to VP and is passing through a point on the axis at distance 15mm form the top face. Draw the development of the lower portion of the prism. — 20

2.A Square prism of base side 35mm & height 55mm rests with its base on HP and two faces equally inclined to VP. Draw the development of lateral surfaces of the retained portions of the cut prism shown by dark lines in the figure. — 20



3. A pentagonal prism of base sides 30mm and axis length 60mm rests with its base — 20

	on HP and an edge of the base inclined at 45° to VP. It is cut by plane perpendicular to VP, inclined at 40° to HP and passing through a point on axis, at distance of 30mm from the base. Develop the remaining surfaces of the truncated prism. 4. A pentagonal prism of base sides 20 mm and height 40 mm is resting with its base on HP with a base edge parallel to VP. The prism is cut as shown in the following front view. Draw the development of lateral surface of prism.  5. A rectangular pyramid, side of base 25 mm × 40 mm and height 50mm has one of the sides of the base inclined at 30° to VP. Draw the development of the lateral surface of the cut pyramid, whose front view shown below. 	20 20
VII	**Multidisciplinary Applications & Practice *:*** **Free hand Sketching;** True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc **Drawing Simple Mechanisms;** Bicycles, Tricycles, Gear trains, **Electric Wiring and lighting diagrams;** Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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. **Graphs & Charts**: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.	25 25 25 25

15.0 QUESTION BANK

Module-I

Projection of Points

1. Draw the projection of the following points on the same XY line, keeping convenient distance between each projector. Name the Quadrants in which they lie.

a. A - 30 mm above HP & 35 mm in front of VP.
b. B - 35 mm above HP & 40 mm behind VP.
c. C - 40 mm above HP & on VP.
d. D - 35 mm below HP & 30mm in front of VP.

2. A point G is 25mm below HP & situated in the third quadrant its shortest distance from XY line is 45 mm. Draw its projections and find its distance from VP.
3. A point S is in the first quadrant and equidistance of 50 mm from all the three principle planes Draw the projection of the point. Draw all the three views of the point.
4. A point P is 30mm in front of VP, 40mm above HP and 50mm from RPP. Draw its projections.
5. A point is 35mm below HP, 20mm behind VP and 25mm behind/in front/ from RPP. Draw its projections and name the side view.
6. A point is 35mm below HP, 15mm behind VP & 25mm behind/in front/from RPP. Draw the projection and name the side view.

Projection of Straight Lines

1. The line AB 100 mm line measures 80 mm in the front view and 70 mm in the top view. The midpoint M of the line is 40 mm from both HP and VP. Draw its projections and find its inclinations.
2. Draw the projection of the line PQ and find its true length and inclination, when the line is inclined at 30 deg to the HP and 45 deg to VP. The line is having one of its end 15 mm above HP and 20 mm in front of VP. The distance between the end projectors on the X-Y line is 60 mm.
3. Two lines AB and AC make an angle of 120 deg between them in their front view and top view of a triangular lamina ABC. AB is parallel to both HP and VP. Determine the real angle between the sides of the triangle AB and AC.
4. A straight road going uphill from point A, due east to another point B, is 4 km long and has a slope of 15 deg. Another straight road from B due 30 deg east of north to a point C is also 4 km long but is on ground level. Determine the length and the slope of a straight road joining the points A and C. Scale; 10 mm = 0.4 km.
5. An object O is placed 1.2 m above the ground and the center of room 4.2 m x 3.6 m x 3.6 m high. Determine graphically its distance from one of the corners between the roof and the two adjacent walls. Scale; 10 mm = 0.5 m

Projection of Plane Surfaces

1. An isosceles triangular plate of negligible thickness has a base 25 mm long and altitude 35 mm. It is so placed on HP such that in the front view it is seen as an equilateral triangle of 25 mm sides that is parallel to VP is inclined at 45 deg to HP. Draw its top and front views. Also determine the inclination of the plate with the reference plane.
2. A square plate of 30 mm sides rests on HP such that one of its diagonals is inclined at 30 deg to HP and 45 deg to VP. Draw its projections.
3. A mirror 30 mm x 40 mm is inclined to the wall such that its front view is a square of 30 mm side. The longer side of the mirror appears perpendicular to both HP and VP. Find the inclinations of the mirror with the wall.
4. A pentagonal lamina having edge 25 mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30 deg to HP and 45 deg to VP. Draw the top and front views of the lamina.
5. A pentagonal lamina of sides 25 mm is having a side both on HP and VP. The surface of the lamina is inclined at an angle of 60 deg to HP. Draw the top and front view of the lamina.
6. A pentagonal lamina having edges 25 mm is placed on one of its corners on VP such that the surface makes an angle of 30 deg with VP and perpendicular bisector of the edge passing through the corner on which it rests makes an inclination to HP at 45 deg. Draw the top and front views of the lamina.

7. A hexagonal lamina of 30 mm sides rests on HP with one of its corners touching VP and surface inclined at 45 deg to it. One of its edges is inclined to HP at 30 deg. Draw the front and top views of the lamina in its final position.
8. A regular hexagonal lamina of sides 25 mm is lying in such a way that one of its sides on HP, while the side opposite to the side on which it rests is on VP. If the lamina makes 60 deg to HP, draw its projections.
9. A hexagonal lamina of sides 25 mm rests on one of its sides on VP. The lamina makes 45 deg to VP and the side on which it rests makes an angle of 45 deg to HP. Draw its projections.
10. A hexagonal lamina of sides 25 mm rests on one of its corners on HP. The lamina makes 45 deg to HP and the diagonal passing through the corner on which it rests appears to be inclined at 30 deg to VP. Draw its projections.
11. A circular lamina of 50 mm diameter rests on HP such that one of its diameters is inclined at 30 deg to VP and 45 deg to HP. Draw its projections.
12. A circular lamina inclined to VP appears in the front view as an ellipse of major axis 30 mm and minor axis 15 mm. The major axis is parallel to both HP and VP. One end of the minor axis is in both HP and VP. Draw its projections and determine the inclinations of the lamina with the VP.
13. An equilateral triangular lamina of 25 mm sides lies on one of its sides on HP. The lamina makes 45 deg with HP and one of its medians is inclined at 45 deg to VP. Draw its projections.

Module – II

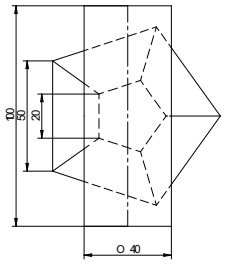
Projections of solids

1. A square prism 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
2. A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that two base edges containing the corner on which it rests makes equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
3. A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 40 deg and VP at 30 deg.
4. A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
5. A pentagonal prism 25 mm sides of base and 50 mm axis length is suspended freely from the corner of the base. Draw the projections of the prism when the axis is appears to be inclined to VP at 45 deg.
6. A square pyramid 35 sides of base and 65 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 deg. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg.
7. A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40 deg and to VP at 30 deg.
8. A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg and VP at 30 deg.
9. A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 deg. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg.
10. A pentagonal pyramid 25 mm sides of base and 50 mm axis length is suspended freely from the corner of its base. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45 deg.

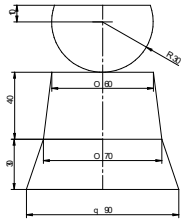
Module - III

Isometric Projections

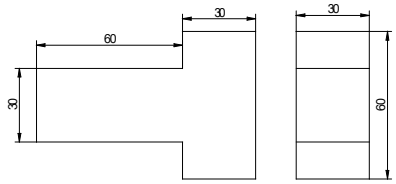
1. A hemisphere of 40 mm diameter is supported co-axially on the vertex of a cone of base diameter 60 mm and axis length 50 mm. The flat circular face of the hemi-sphere is facing upside. Draw the isometric projection of the combination of solids.
2. Draw the isometric projection of rectangular prism of 60 x 80 x 20 mm thick Para mounting a tetrahedron of side 45 mm such that the axis of the solids is collinear and at least one of the edges of the solids are parallel to VP.
3. A cone of base diameter 40 mm and height 50 mm rests centrally over a frustum of a pentagonal pyramid of base side 45 mm and top side 35 mm and height 55 mm. Draw the isometric projections of the solids.
4. The following fig shows the top view of the cylinder which is centrally mounted on a frustumof pentagonal pyramid of 60 mm height. Draw the isometric projection of the combination of solids.



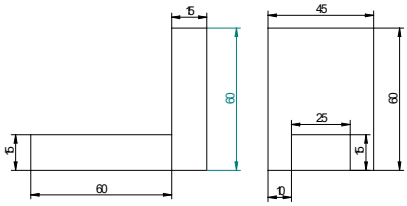
5. Following fig shows the front view of the combination of solids consisting a cut sphere and frustums of a cone and a square pyramid. Draw the isometric projections of the combination of solids.



6. A sphere of diameter 30 mm rests on the frustum of a hexagonal pyramid base 30 mm, top face 18 mm and the height 50 mm such that the axes coincide. Draw the isometric projection of the combination of the solids.
7. Following fig shown the front and side views of the solid. Draw the isometric projection of the solid.



8. Following fig shows the front and side views of the solid. Draw the isometric projection of the solid

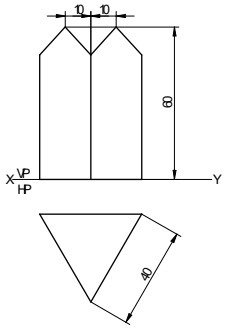


9. A sphere of diameter 40 mm is placed centrally on the flat face of the hemisphere dia 60 mm. Draw the isometric projection of the combination.
10. Three rectangular slabs (l x b x h) 100 mm x 60 mm x 20 mm, 100 mm x 40 mm x 20 mm and 100 mm x 20 mm x 20 mm are placed one above the other in the descending order of their width b such that their longer axes are coplanar. Draw the isometric projection of the combination.

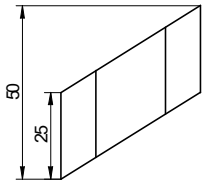
Module – IV

Development of Lateral Surfaces of Solids

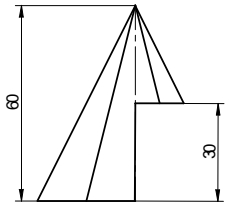
1. Draw the development of truncated portion of lateral faces of pentagonal prism of 20 mm sides of base and 50 mm height standing vertically with one of its rectangular faces parallel to VP and nearer to it so as to produce one piece development. The inclined face of the truncated prism is 30 deg to its axis an passes through the right extreme corner of the top face of the prism.
2. A triangular prism with one of its rectangular faces parallel to VP and nearer to it is cut as shown in the fig. Draw the development of the retained portions of the prism which are shown in dark lines.



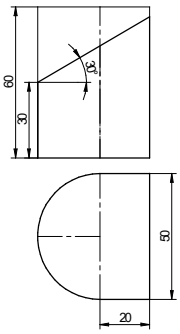
3. A hexagonal prism of base side 20 mm and height 50 mm is resting on HP on its base, such that one of its base edge is parallel to VP. The prism is cut in this position as shown in the following front view. Draw the development of the lateral surface of the prism.



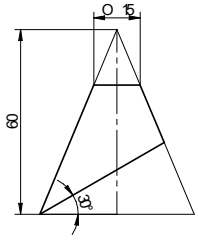
4. The inside of the hopper of the floor mill is to be lined with thin sheet. The top and bottom of the hopper are regular pentagon with each side equal to 30 mm and 22.5 mm respectively. The height of the hopper is 30 mm. Draw the shape of the sheet to which it is to be cut so as to fit into the hopper.
5. A square pyramid of side of base 45 mm, altitude 70 mm is resting with its base on HP with two sides of the base parallel to VP. The pyramid is cut by section plane which is perpendicular to VP and inclined at 40 deg to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces of the truncated pyramid.
6. The hexagonal pyramid of 30 mm base sides with a side of the base parallel to VP. Draw the development of the lateral surfaces of the retained portions of the pyramid cut by two perpendicular planes shown by dark lines in the fig.



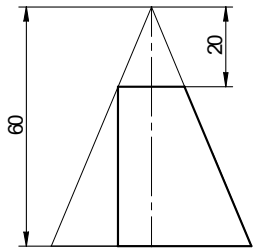
7. A pipe made of using half tubular (circular) with a half square in shape is cut as shown in the following in the fig. Draw the development of the lateral surface of the object.



8. Draw the development of the lateral surface of the cone whose front view is shown in the following fig.



9. A funnel is to be made of sheet metal. A funnel tapers from 40 mm to 20 mm diameter to a height of 20 mm and from 20 mm to 15 mm diameter for the next 20 mm height. The bottom of the funnel is beveled off to a plane inclined at 45 deg to the axis. Draw the development of the funnel.
10. Draw the development of lateral surface of the cut cone whose front view is shown in the fig.



Module-V

Multidisciplinary Applications & Practice

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

Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains,

Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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.

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

	S J P N Trust's **Hirasugar Institute of Technology, Nidasoshi** *Inculcating Values, Promoting Prosperity* Approved by AICTE, New Delhi, Permanently Affiliated to VTU, Belagavi Recognized under 2(f) &12B of UGC Act, 1956 Accredited at 'A' Grade by NAAC & Programmes Accredited by NBA: CSE & ECE	**First Year Engg. Dept.** **Academics** **Course Plan** **2023-24 (Evn)**

Prepared by	Checked by		
Prof.Girish Zulapi	**Prof.D.N.Inamdar**	**HOD**	**Principal**

Subject Title	**INTRODUCTION TO ELECTRICAL ENGINEERING**		
Subject Code	BESCK204B	**CIE Marks**	50
Teaching hours/week(L:T:P:S)	3:0:0:0	**SEE Marks**	50
Total Hours of Pedagogy	40	**Exam Hours**	100
CREDITS – 03			

FACULTY DETAILS:		
Name: Dr. B. V. Madiggond	**Designation:** Professor & HOD	**Experience: 30Years**
No. of times course taught(including present): 23	**Specialization:** Power Electronics	

1.0 Prerequisite Subjects:

Sl. No	Basics required	Class	Subject
01	Basic knowledge of electrical quantities like voltage, current, power and circuit elements like resistor, capacitor & inductor.	PUC I/II	Physics
02	Algebraic equations and its simplification.	PUC I/II	Mathematics
03	AC Fundamentals	PUC-II	Physics

2.0 Course Objectives

- To explain the laws used in the analysis of DC and AC circuits.
- To explain the behavior of circuit elements in single-phase circuits.
- To explain the construction and operation of transformers, DC generators and motors and induction motors.
- To introduce concepts of circuit protecting devices and earthing.
- To explain electric power generation, transmission and distribution, electricity billing, equipment and personal safety measures.

3.0 Course Outcomes

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

	Course Outcome	RBT Level	POs
C103.1	Understand the concepts of various energy sources and Electric circuits.	L2	1, 2, 3, 5, 6, 7, 8, 12
C103.2	Apply the basic Electrical laws to solve circuits.	L2	1, 2, 3, 4, 5, 6, 12
C103.3	Discuss the construction and operation of various Electrical Machines.	L2	1, 2, 3, 4, 5, 6, 7, 8, 12
C103.4	Identify suitable Electrical machine for practical implementation.	L2	1, 2, 3, 4, 6, 7, 8, 12
C103.5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.	L2	1, 2, 3, 5, 6, 7, 8, 11, 12
	Total Hours of instruction		**40**

4.0 Course Content

MODULE-1

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

Power Generation: Hydel, Nuclear, Solar & wind power generation (Block Diagram approach).

DC Circuits: Ohm's Law and its limitations. KCL & KVL, series, parallel, series-parallel circuits. Simple Numerical.

MODULE-2

A.C. Fundamentals: 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).

Three Phase Circuits: Generation of Three phase AC quantity, advantages and limitations; star and delta connection, relationship between line and phase quantities (excluding proof)

MODULE-3

DC Machines:

DC Generator: Principle of operation, constructional details, induced emf expression, types of generators. Relation between induced emf and terminal voltage. Simple numerical.

DC Motor: 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

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

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.

5.0 Relevance to Real World

SL. No	Real World Mapping
1.	Calculating branch current in the circuits, measurement of power, evaluating performance analysis of electric machines, Use of Fuses and MCB.
2.	Installation of Electrical Earthing and Power Supply scheme for transmission and distribution.
3.	Understanding of Electric Safety measures and Electricity billing.

6.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
1	Demonstration (Using Models, Charts and field visits)	Topic: 1) Visit to basic electrical engg. lab to understand dc circuits, Single and three phase circuit configurations, measurement of power and application of maximum power transfer theorem. 2) Visit to Electrical machines lab to observe the cut out section and actual machine parts. 3) Field visit of HT Substation, Power distribution control panel room and Generator to understand electricity billing and layout.

7.0 Books Used and Recommended to Students

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, 3rd edition, 2014.

8.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

- http://nptel.vtu.ac.in/econtent/BS.php
- https://www.electrical4u.com

9.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	Journal of Electrical Engg.	http://www.jee.ro
2	Electrical4U	http://www.electrical4u.com

10.0 Examination Note

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 25 Marks;

- 1st, 2nd, and 3rd tests shall be conducted after completion of the syllabus of 30-35%, 70-75%, and 90-100% of the course/s respectively.
- The average of best two IAs will be considered for the CIE.
- If the nature of the courses requires assignments/Seminars/Quizzes/group discussion, etc, **TWO** evaluation components shall be conducted for 25 Marks each and average of this will be considered for CIE.

Total CIE marks will be 50 marks (IA + CCE)

Semester End Examination (SEE):

Only those students who satisfy the attendance and CIE requirement shall be eligible to appear for the SEE of that course.

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 20marks. 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.

11.0 Course Delivery Plan

Module	Lecture No.	Content of Lecture	% of Portion coverage
I	1.	**Introduction:** Conventional and non-conventional energy resources.	20
	2.	General structure of electrical power systems using single line diagram approach.	
	3.	**Power Generation:** Hydel, Nuclear.	
	4.	Solar & wind power generation (Block Diagram approach).	
	5.	**DC Circuits:** Ohm's Law and its limitations.	
	6.	KCL & KVL, series, parallel.	
	7.	Series-parallel circuits.	
	8.	Simple Numerical	
II	9.	**A.C. Fundamentals:** Equation of AC Voltage and current, waveform, time period, frequency, amplitude.	20
	10.	phase, phase difference, average value, RMS value, form factor, peak factor. (only definitions)	
	11.	Voltage and current relationship with phasor diagrams in R, L, and C circuits.	
	12.	Concept of Impedance. Analysis of R-L series circuit.	
	13.	Analysis of R-C, R-L-C Series circuits. Active power, reactive power and apparent power. Concept of power factor. (Simple Numerical).	
	14.	**Three Phase Circuits:** Generation of Three phase AC quantity, advantages and limitations.	
	15.	star and delta connection, relationship between line and phase quantities (excluding proof)	
	16.	Simple numerical.	
III	17.	**DC Machines:** **DC Generator:** Principle of operation, constructional details.	20
	18.	Induced emf expression, Relation between induced emf and terminal voltage. Simple numerical.	
	19.	Types of generators.	
	20.	**DC Motor:** Principle of operation, back emf and its significance.	
	21.	Torque equation, types of motors, characteristics and speed control (armature & field) of DC motors (series & shunt only).	
	22.	Characteristics and speed control (armature & field) of DC motors (series).	
	23.	Characteristics and speed control (armature & field) of DC motors (shunt).	
	24.	Applications of DC motors. Simple numerical.	

IV	25.	**Transformers:** Necessity of transformer, principle of operation,	**20**
	26.	Types and construction of single phase transformers.	
	27.	EMF equation, losses, variation of losses with respect to load. Efficiency	
	28.	Simple numerical.	
	29.	**Three-phase induction Motors**: Concept of rotating magnetic field, Principle of operation.	
	30.	Constructional features of motor, types – squirrel cage and wound rotor.	
	31.	Slip and its significance	
	32.	Simple numerical	
V	33.	**Domestic Wiring:** Requirements, Types of wiring: casing, capping.	**20**
	34.	Two way and three way control of load.	
	35.	**Electricity Bill:** Power rating of household appliances including air conditioners, PCs, laptops, printers, etc	
	36.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff.	
	37.	Calculation of electricity bill for domestic consumers.	
	38.	**Equipment Safety measures:** Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	
	39.	**Personal safety measures:** Electric Shock, Earthing and its types.	
	40.	Safety Precautions to avoid shock.	

12.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl. No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1:	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 1	4	Individual Submission in the standard format is expected	Books 1 and 2 of the text books.
		Students study the Topics and write the Answers. Get practice to solve university questions.	Module 2	6	Individual Submission in the standard format is expected	Books 1 and 2 of the text books..
2	Assignment 2:	Students study the Topics and write the Answers. Get practice to solve university questions	Module 3	8	Individual Submission in the standard format is expected	Books 1 and 2 of the text books.
		Students study the Topics and write the	Module 4	10	Individual Submission in the	Books 1 and 2 of the text

		Answers. Get practice to solve university questions			standard format is expected	books.

13.0 QUESTION BANK

MODULE-1

Introduction and Power Generation

1. Explain about conventional and non-conventional energy sources.
2. With neat block diagram Hydel power generation.
3. Explain nuclear power generation with neat block diagram.
4. Explain solar power generation with neat block diagram.
5. Explain wind power generation with neat block diagram.
6. Explain the general structure of electrical power systems using single line diagram.

DC circuits

7. Explain ohms law and state its limitations.
8. How the voltage and current is divided in series, parallel and series-parallel circuits? Also state the advantages & limitations of these circuits.
9. Find current through all the branches of the network shown in fig1.below.
10. For the circuit shown in fig.2 Calculate, a) equivalent resistance between the supply terminals b) Current supplied by the source c) Power consumed by the 16 ohm resistor.

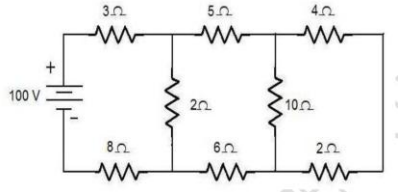


Fig.1

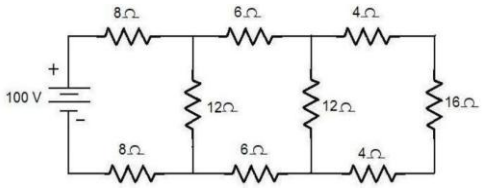


Fig.2

11. In the circuit shown in Fig3, determine the current through the 2 ohm resistor and the total current delivered by the battery. Use Kirchhoff's laws.
12. In the network shown in fig 4, find the current delivered by the battery.

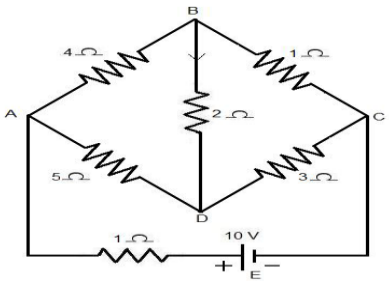


Fig.3

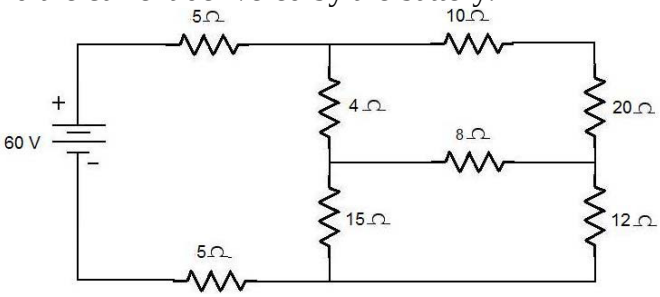


Fig.4

13. Find the unknown resistor R where power consumed by the network is 16W for the network shown in fig.5.
14. Find the currents I_1,I_2 and I_3 for the circuit shown in Fig.6. Also find potential difference

between a and b.

15. Determine the potential difference between x and y. for the circuit shown in fig.7.

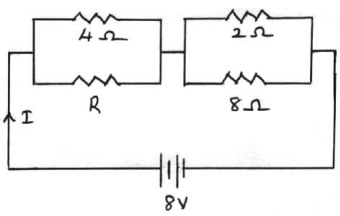


Fig.5

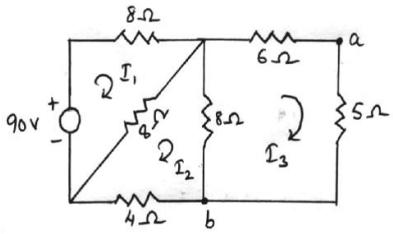


Fig.6

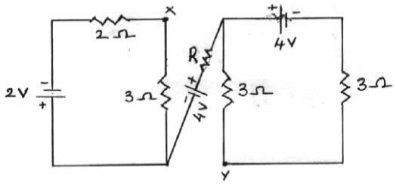
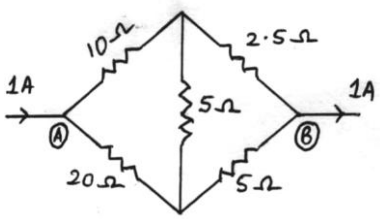


Fig.7

16. Find the currents in all the resistors of the network shown in the fig. Also find the potential at *A* w.r.t. that at *B*.



17. A resistance *R* is in series with a parallel combination of two resistances of 12 Ω and 8 Ω. The total power dissipation in the circuit is 70 W when the supply voltage is 20 V. Find *R*.
18. A current of 20 A flows through two ammeters *A* and *B* in series. The p.d. across *A* is 0.2 V and that across B is 0.3 V. Find how the same current will divide between *A* and *B* when they are in parallel.

MODULE -2

Single Phase Circuits

1. Define/Explain the following terms w.r.t alternating quantities: a) Phase & phase difference and b) Frequency and period.
2. Define and hence find the instantaneous value, peak value, RMS value, average value, form factor and peak factor of alternating quantities.
3. With a neat schematic, explain the principle of generation of alternating voltage.
4. Explain the generation of single-phase AC induced emf with sinusoidal diagram.
5. The equation for an AC voltage is given as V= 0.04sin (200t+60º) V. Determine the frequency, the angular frequency, instantaneous voltage when t= 160μs. What is the time represented by 60' phase angle?
6. Show that the average power consumed in a pure capacitor and in a pure inductor is zero.
7. Define power factor, explain its significance and establish the phase relationship between voltage and current in series and parallel combinations of a) *RL* circuit, b) *RC* circuit and c) *RLC* circuits (for different cases). Sketch the phasor diagrams and impedance diagrams in all the cases.
8. A coil when connected to 200V, 50Hz supply takes a current of 10A and dissipates 1200W. Find the resistance & reactance of the coil. Find also the real power, reactive power and overall power. Sketch the phasor diagram.
9. A coil of 50Ω and 0.5H is connected across 200V, 50Hz supply. Find a) Inductive reactance, b) Circuit impedance, c) Supply current, d) Power factor, e) Phase angle, f) Voltages across *R* &*L*

and g) Active, reactive and overall (apparent) power. Obtain expressions for voltage and current. Also sketch the complete phasor and vector diagrams.

10. A capacitor of 15μF is connected in series with a non-inductive resistance of 100Ω across a 100V, 50Hz supply. Find a) Capacitive reactance, b) Impedance, c) Current, d) Power factor, e) Phase angle, f) Voltages across *R* &*C* and g) Power dissipated. Obtain expressions for voltage and current. Also sketch the phasor diagrams.
11. An *RLC* series circuit has the following data. *R*=25Ω; *L*=150mH; *C*=20μF; 250V 50Hz supply. Determine the supply current and the various voltage drops. Represent them in a phasor diagram.
12. A choke is connected in series with a non-inductive resistor across a 250V, 50Hz supply. It draws a current of 5A. The voltage across the coil and the non-inductive resistance are 125V & 200V respectively. Find: a) *R, X, Z* &*Y*, b) Power loss in the coil, and c) Total power supplied. Sketch the phasor and impedance diagrams.
13. Two impedances Z_1= (150-j157) Ω&Z_2 = (100+j100)Ω are connected in parallel across a 200V, 50Hz supply. Find a) Branch currents, b) Total current and c) Complex power, and d) Total power. Sketch the complete phasor and admittance diagrams.
14. An ac generator with an internal impedance of (3+j2.4) Ω is connected to load impedance consisting of two impedances (12+j10) Ω & (16-j12) Ω in parallel. If the supply voltage is 100V, determine a) the current in each branch, b) the power in each branch
15. Show that in a pure inductor the current lags behind the voltage by 90º. Also draw the voltage and current waveforms.

Three Phase Circuits:

16. With a schematic, explain the principle of generation of 3-phase emf. What are the characteristics of balanced supply? When is a load said to be balanced? Establish the relationship between the phase & line currents and voltages in a 3-phase delta. In the case of balanced supply and load, (a) are the phase voltages equal? (b) are the line currents equal? Justify your answers. Sketch the complete phasor diagrams in every case.
17. Explain the concept of 'phase sequence'. Establish the relationship between the phase & line currents and voltages in a 3Φ star with 3-wire and 4-wire systems. In the case of balanced supply and balanced load, (a) are the line voltages equal? (b) are the phase currents equal? Justify your answers. Sketch the complete phasor diagrams in every case.
18. What are the advantages of a 3Φ system over a single-phase system?
19. A balanced 3phase star connected load of 150kw takes a leading current of 100A with a line voltage of 1100V, 50Hz. Find the circuit constants of the load per phase.
20. A star connected load has impedance (20+j60) Ω in each phase when connected to 415 V, 3 Phase, 50 Hz supply. Calculate the power delivered by the source and power factor of the load.
21. Three similar choke coils are connected in star to a three phase supply. If the line current is 25 A, the total power consumed is 11 kW and the volt –amp input is 15 kVA. Find the line and phase voltages, the VAR input and the reactance and resistance of each coil.
22. If these coils are now connected in delta, calculate phase and line currents, active and reactive power.

MODULE-3

DC Machines & DC Generators

1. Explain the principle of operation of a dc generator.
2. With a neat sketch explain the construction of a dc generator.
3. Derive the emf equation of a dc generator.
4. Explain the different types of dc generators & mention their applications.

5. A 4 pole, wave-wound dc generator has 50 slots and 24 conductors / slot. The flux/pole is 10mWb. Determine the induced emf in the armature if it is rotating at 600 rpm. Solve the same problem if the machine is lap-wound.
6. A 6 pole, wave-wound DC generator has 70 conductors & 12mWb flux/pole. Determine the speed of the armature if the induced emf is 400V. What will be the speed when it is lap wound and generating 400V?
7. A dc shunt generator supplies a load of 10kW at 250V. Calculate the induced emf if the armature resistance is 0.5 Ωand shunt field resistance is 100Ω.
8. A shunt generator has an induced emf of 254V. When the machine is loaded the terminal voltage falls to 240V. Find the load current if the armature resistance and field resistance are 0.04 Ω & 24 Ω respectively. Brush contact drop is 1.5V/brush.

DC Motor

9. Explain the principle of operation of a dc motor.
10. Explain the significance of back emf of a dc motor. Derive an expression for the back emf.
11. Derive the torque equation of a dc motor.
12. Explain the different types of dc motors. Mention their applications.
13. Sketch and explain the following characteristics for series, shunt motors.
    (i) Torque vs. Armature current, and (ii) Speed vs. Armature current.
14. A 20kW, 200V dc shunt generator has a armature and field resistances of 0.05 Ω and 150 Ω respectively.
    Determine the total current and power developed when working as a motor taking 20kW power.
15. A 250V dc series motor has an armature resistance of 0.05 Ω and field resistance of 0.02 Ω. It runs at 900rpm taking 30A. Determine its speed when it takes a current of 25A.
16. A dc shunt motor runs at 950 rpm on 200V with 40A armature current. Its armature resistance is 0.8 Ω. What resistance is required to be connected in the armature circuit to reduce the speed to 725 rpm without changing the armature current?

MODULE-4

Transformers

1. Explain the construction & principle of operation of 1Φ transformer. Derive the emf equation of a transformer.
2. What are the losses in a transformer? On what factors do they depend? How are losses reduced in a transformer by construction?
3. Explain with neat sketches the core and shell type transformers.
4. Define and explain the term *efficiency of* a transformer.
5. A 125kVA transformer has a primary voltage of 2000V at 60Hz with 182 & 40 turns on primary and secondary respectively. Neglecting the losses calculate a) no load secondary emf b) full load primary & secondary currents and c) flux in the core.
6. A 25kVA transformer has an efficiency of 97% both at FL and at half load at 0.8pf. Determine a) full load iron & copper loss, b) efficiency at 75% FL and c) max efficiency.
7. A 25kVA, 2200/250V transformer has an iron loss of 600W & full load copper loss of 1000W. Calculate efficiencies at i) full load ii) 75% load iii) 50% load iv) 25% load at upf& 0.8pf lag, v) Losses at max. Efficiency vi) load for max. Efficiency and vii) max. Efficiency at upf.
8. The iron and full load copper losses in a 40kVA, 1Φ transformer are 450W & 850W respectively.
    Find i) efficiency at full load, 0.8pf lag ii) max efficiency and iii) load at which the maximum efficiency occurs.

9. A 50kVA transformer has an efficiency of 98% at full load 0.8pf and 97% at half load 0.9pf. Determine the full load iron and copper losses. Find the load at which max. Efficiency occurs as also the maximum efficiency.
10. Give reasons for the following: a) Core loss in a transformer remains almost constant b) A laminated steel core is used in a transformer.
11. List different types of loss in a transformer and explain each one in brief.
12. A 12 pole, 3Φ alternator is coupled to an engine running at 500rpm. It supplies an induction motor which has a full load speed of 1440rpm. Find the percentage slip and the number of poles of the motor.

Three Phase Induction Motors:

13 Explain the principle of operation and constructional features of a 3Φ induction motor.
14 Define and explain slip in an induction motor.
15 What are squirrel cage and wound-rotor induction motors? What are their relative advantages and disadvantages? Mention their applications.
16 A 3Φ, 8 pole, 60Hz induction motor has a slip of 3% at full load. Find the synchronous speed and the frequency of rotor current at full load.
17 Explain the concept of rotating magnetic field and show that resultant flux remains same at different instants of time.

MODULE-5

Domestic wiring:

1. What are the requirements of domestic wiring system?
2. Mention the various types of wiring.
3. Explain casing-capping wiring with neat diagram.
4. Explain two way control of load with neat circuit diagram and truth table.
5. Explain three way control of load with neat circuit diagram and truth table.

Electricity bill:

6. What do you understand by Tariff? Discuss the objectives of Tariff.
7. Describe the desirable characteristics of a tariff.
8. Explain two part tariff.
9. A consumer has a maximum demand of 200 kW at 40% load factor. If the tariff is Rs. 100 per kW of maximum demand plus 10aise per kWh, Find the overall cost per kWh.
10. What is the unit for measure for electricity consumption?
11. What do you understand by term "unit" w.r.t. consumption of electrical energy.

Equipment Safety measures:

12. What is fuse? Discuss the advantages and disadvantages of a fuse.
13. What are desirable characteristics of fuse element.
14. Define and explain the following terms
    i) Fusing current ii) Cut off current iii) Operating time iv) Breaking capacity
15. Explain the term 'fusing factor' with respect to fuse element.
16. Explain the working principle of fuse and MCB. Also discuss their merits and demerits.
17. Write a short note on difference between fuse and miniature circuit breaker w.r.t. protection of electrical installation.

Personal Safety measures

18. What is the need of earthing in electrical installation?
19. What is earthing? Why earthing is required?
20. With the help of neat sketch, explain plate earthing.
21. With the help of neat sketch, explain pipe earthing.
22. Write a short note on precautions against electric shock.
23. What is electric shock? What are the precautions to be taken to prevent electric shocks?

Prepared and Checked by		
Dr. B. V. Madiggond	**HOD**	**Principal**

Professional Writing Skills in English			
Subject Code	**BPWSK206**	**CIE Marks**: IA-Tests(20) + Assignments(10)+	**50**
Teaching Hours/Week (L:T:P:S)	**2:0:0:0**	**SEE Marks**	**50**
Total Hours of Pedagogy	**02 Hours/Week**	**Total marks (CIE + SEE)**	**100**
Credits	**02**	**SEE Hours**	**02**

FACULTY DETAILS:		
Name: Prof. B. S. Hooli	**Designation:** Lecturer	**Experience:** 20 Yrs
No. of times course taught: 2	**Specialization:** English	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	-	-	Basic English Skills

2.0 Course Objectives

The course (BPWSK206) will enable the students,

- To Identify the Common Errors in Writing and Speaking of English.
- To Achieve better Technical writing and Presentation skills for employment.
- To read Technical proposals properly and make them to Write good technicalreports.
- Acquire Employment and Workplace communication skills.
- To learn about Techniques of Information Transfer through presentation indifferent level.

3.0 Course Outcomes

At the end of the course (BPWSK206) the student will be able:

CO	Course Outcome	Cognitive Level	POs
C112.1	To understand and identify the Common Errors in Writing and Speaking.	L1,L2	1,2,3,8,10
C112.2	To Achieve better Technical writing and Presentation skills.	L1,L2,L3	1,2,3,8,10

C112.3	To read Technical proposals properly and make them to Write good technical reports.	L1,L2,L3	1, 2, 3,8,10

C112.4	Acquire Employment and Workplace communication skills.	L1,L2,L3	1, 2,3,8,10
C112.5	To learn about Techniques of Information Transfer through presentation in different level.	L1,L2,L3	1, 2,3,8,10

4.0 Course Content

Module-1

Identifying Common Errors in Writing and Speaking English:

- Advanced English Grammar for Professionals with exercises, Common errors identification in parts of speech, Use of verbs and phrasal verbs, Auxiliary verbs and their forms, Subject Verb Agreement (Concord Rules with Exercises).
- Common errors in Subject-verb agreement, Noun-pronoun agreement, Sequence of Tenses and errors identification in Tenses. Advanced English Vocabulary and its types with exercises – Verbal Analogies, Words Confused/Misused.

Module -2

Nature and Style of sensible writing:

- Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion, Importance of Proper Punctuation, The Art of Condensation (Precise writing) and Techniques in Essay writing, Common Errors due to Indianism in English Communication, Creating Coherence and Cohesion, Sentence arrangements exercises, Practice of Sentence Corrections activities. Importance of Summarising and Paraphrasing.
- Misplaced modifiers, Contractions, Collocations, Word Order, Errors due to the Confusion of words, Common errors in the use of Idioms and phrases, Gender, Singular & Plural. Redundancies & Clichés.

Module- 3

Technical Reading and Writing Practices:

- Reading Process and Reading Strategies, Introduction to Technical writing process,
- Understanding of writing process, Effective Technical Reading and Writing Practices , 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 – Voice and Speech (Active and Passive Voices) and Reported Speech, Spotting Error Exercises, Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.

Module- 4

Professional Communication for Employment:

- The Listening Comprehension, Importance of Listening Comprehension, Types of Listening, Understanding and Interpreting, Listening Barriers, Improving Listening Skills. Attributes of a good and poor listener.
- Reading Skills and Reading Comprehension, Active and Passive Reading, Tips for effective reading.
- Preparing for Job Application, Components of a Formal Letter, Formats and Types of official, employment, Business Letters, Resume vs Bio Data, Profile, CV and others, Types of resume, Writing effective resume for employment, Model Letter of Application (Cover Letter) with Resume, Emails, Blog Writing, Memos (Types of Memos) and other recent communication types.

Module-5

Professional Communication at Workplace:

- Group Discussions – Importance, Characteristics, Strategies of a Group Discussions. Group Discussions is a Tool for Selection. Employment/ Job Interviews - Importance, Characteristics,

Strategies of a Employment/ Job Interviews. Intra and Interpersonal Communication Skills - Importance, Characteristics, Strategies of a Intra and Interpersonal Communication Skills. Non-Verbal Communication Skills (Body Language) and its importance in GD and PI/JI/EI.

- Presentation skills and Formal Presentations by Students - Importance, Characteristics, Strategies of Presentation Skills. Dialogues in Various Situations (Activity based Practical Sessions in class by Students).

5.0 Suggested Learning Resources

Text Books

1. **A Course in Technical English,** Cambridge University Press – 2020.
2. **Functional English (As per AICTE 2018 Model Curriculam)** Cengage learning India Pvt Limited [Latest Revised Edition] - 2020.
3. **Communication Skills** by Sanjay Kumar and Pushp Lata, Oxford University Press - 2018. Refer it's workbook for activities and exercises – "Communication Skills – I (A Workbook)" published by Oxford University Press – 2018.
4. **Professional Writing Skills in English,** Infinite Learning Solutions – (Revised Edition) 2021.
5. **Technical Communication –** Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017.
6. **High School English Grammar & Composition** by Wren and Martin, S Chandh & CompanyLtd – 2015.
7. **Effective Technical Communication** – Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private Limited – 2018.
8. **Intermediate Grammar, Usage and Composition** by M.L.Tichoo, A.L.Subramanian,

6.0 Examination Note

Assessment Details (both CIE and SEE):

Continuous internal evaluation (CIE) needs to be conducted for 50 marks like Engineering courses. The weight age of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 40% of maximum marks in CIE and 35% of maximum marks in SEE to pass. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration). Based on this grading will be awarded.

Continuous Internal Evaluation (CIE) :

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

All the tests are preferred similar to SEE pattern; however, the teacher may follow test pattern similar to other theory courses of Engineering.

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester.

5. Second assignment at the end of 9th week of the semester.

Report writing /Group discussion/Seminar any one of three suitably planned to attain the COsand POs for **20 Marks (duration 01 hours)**

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100marks and will be **scaled down to 50 marks**

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

Semester End Examinations (SEE)

SEE paper will be set for 100 questions of each of 01 marks. The pattern of the question paper is MCQ. The time allotted for SEE is 120 minutes. Marks scored are scaled down to 50 Marks.
(Time duration may be made 90 minutes to train the students for engineering / non-engineering competitive examination)

1. Professional Writing Skills in English has become a very important component in all engineering and non-engineering competitive examinations. In exams like GRE, TOEFL, IELTS and GATE exam, all state and Central Government recruitment examinations, placement tests and other Examinations, so the pattern of question paper, in general, will be in multiple-choice question (MCQ) Pattern. So, to meet the relevance of the recruitment requirement of our Engineering students "Professional writing skill in English" Semester end examination (SEE) will be conducted in a multiple choice question (MCQ) pattern.
1. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration).

7.0 Course Delivery Plan

Module	Lecture No.	Content of Lecture		% of Portion
		PART - A	**Teaching-Learning Process**	
1	1	Advanced English Grammar for Professionals with exercises	Chalk &board, PPT, Animation, Active Learning	20
	2	Common errors identification in parts of Speech		
	3	Use of verbs and phrasal verbs, Auxiliary verbs and their forms		
	4	Subject Verb Agreement (Concord Rules with Exercises)		
	5	Common errors in Subject-verb agreement, Noun pronoun agreement, Sequence of Tenses and errors identification in Tenses.		
	6	Advanced English Vocabulary and its types with exercises – Verbal Analogies, Words Confused/Misused.		

2	7	Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion.		20

	8	Importance of Proper Punctuation, The Art of Condensation (Precise writing) and Techniques in Essay writing, Common Errors due to Indianism in English Communication	Chalk & board, Active Learning, Problem based learning	
	9	Creating Coherence and Cohesion, Sentence arrangements exercises, Practice of Sentence Corrections activities. Importance of Summarising and Paraphrasing.		
	10	Misplaced modifiers, Contractions, Collocations, Word Order		
	11	Errors due to the Confusion of words		
	12	Common errors in the use of Idioms and phrases, Gender, Singular & Plural. Redundancies & Cliches.		
3	13	Reading Process and Reading Strategies, Introduction to Technical writing process.	Chalk & board, PPT, Animation, NPTEL, Active Learning	20
	14	Understanding of writing process, Effective Technical Reading and Writing Practices		
	15	Introduction to Technical Reports writing, Significance of Reports, Types of Reports.		
	16	Introduction to Technical Proposals Writing, Types of Technical Proposals, Characteristics of Technical Proposals. Scientific Writing Process.		
	17	Grammar – Voice and Speech (Active and Passive Voices) and Reported Speech.		
	18	Spotting Error Exercises, Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.		
4	19	The Listening Comprehension, Importance of Listening Comprehension, Types of Listening, Understanding and Interpreting, Listening Barriers.	Chalk& board, Problem based learning	20
	20	Improving Listening Skills. Attributes of a good and poor listener.		
	21	Reading Skills and Reading Comprehension, Active and Passive Reading, Tips for effective reading.		
	22	Preparing for Job Application, Components of a Formal Letter, Formats and Types of official, employment, Business Letters.		
	23	Resume vs Bio Data, Profile, CV and others, Types of resume, Writing effective resume for employment		
	24	Model Letter of Application (Cover Letter) with Resume, Emails, Blog Writing, Memos (Types of Memos) and other recent communication types.		
5	25	Group Discussions – Importance, Characteristics, Strategies of a Group Discussions.	Chalk& board, Problem based learning	20
	26	Group Discussions is a Tool for Selection. Employment/ Job Interviews - Importance, Characteristics, Strategies of a Employment/ Job Interviews.		

	27	Intra and Interpersonal Communication Skills - Importance, Characteristics, Strategies of a Intra and Interpersonal Communication Skills		
	28	Non-Verbal Communication Skills (Body Language) and its importance in GD and PI/JI/EI.		
	29	Presentation skills and Formal Presentations by Students - Importance, Characteristics, Strategies of Presentation Skills.		
	30	Dialogues in Various Situations (Activity based Practical Sessions in class by Students).		

Examination	S+	S	A	B	C	D	E	F	% Passing
JAN - 2021									
JAN - 2020									
JAN - 2019									

Prepared by	Checked by		
Prof. B. S. Hooli	Dr. K. B. Manwade	HOD	Principal

Subject Title	Balake Kannada		
Subject Code	BKBKK207	CIE Marks	50
		SEE Marks	50
Number of Lecture Hrs / Week	1	Total Marks	100
Total Number of Lecture Hrs	15	Exam Hours	1 H
Credits: 1			

FACULTY DETAILS:		
Name: Smt. B S KOTEPPAGOL	Designation: Asst. Professor	Experience: 05
No. of times course taught:5	Specialization: MA IN KANNADA	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
1			

2.0 Course Objectives

1. To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
2. To enable learners to Listen and understand the Kannada language properly.
3. To speak, read and write Kannada language as per requirement.
4. To train the learners for correct and polite conservation

3.0 Course Outcomes

At the end of the Course, The Students will be able

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

4.0 Course Content

Module-1

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

Module-2

1. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು
   Possessive forms of nouns, dubitive question and Relative nouns
2. ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು
   Qualitative, Quantitative and Colour Adjectives, Numerals.
3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ)
   Predictive Forms, Locative Case

Module-3

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

Module-4

1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು
   Permission, Commands, encouraging and Urging words (Imperative words and sentences)
2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು
   Accusative Cases and Potential Forms used in General Communication
3. "ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು
   Helping Verbs"iru and iralla", Corresponding Future and Negation Verbs
4. ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ
   Comparitive, Relationship, Identification and Negation Words

Module-5

1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು
   ifferent types of forms of Tense, Time and Verbs

2. ದ್,-ತ್,-ತು,- ಇತು, - ಆಗಿ, -ಅಲ್ಲ,-ಗ್,-ಕ್, ಇದೆ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ - Formation of Past, Future and Present Tense Sentences with Verb Forms
3. Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation

5.0 Relevance to future subjects

Sl.No.	Semester	Subject	Topics
			-
			-

6.0 Relevance to Real World

Sl.No	Real World Mapping

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details

8.0 Books Used and Recommended to Students

Text Books

Balake Kannada

Reference books

1. ಸಂಕ್ಷಿಪ್ತ ಕನ್ನಡ ನಿಘಂಟು (ಪರಿಷತ್ತು), ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್, ಬೆಂಗಳೂರು
2. ಕನ್ನಡ ಕಲಿ ಪಠ್ಯಪುಸ್ತಕ – ಲಿಂಗದೇವರು ಹಳೆಮನೆ, ಪ್ರಸಾರಾಂಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/ Animation/ Videos Recommended

Website and Internet Contents References

10.0 Magazines/Journals Used and Recommended to Students

Sl. No	Magazines/Journals	Website
3		

11.0 Examination Note

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 25 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 25 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 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.

12.0 Course Delivery Plan

Module	Lecture No./Practical Session	Content of Lecture	% of Portion
Module-1	L-1	Introduction, Necessity of learning a local language. Methods to learn the Kannada language.	20
	L-2	Easy learning of a Kannada Language: A few tips. Hints for correct and polite conservation, Listening and Speaking Activities, Key to Transcription.	
	L-3	ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು Personal Pronouns, Possessive Forms, Interrogative words.	
Module-2	L-1	ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು Possessive forms of nouns, dubitive question and Relative nouns	20
	L-2	ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and Colour Adjectives, Numerals	
	L-3	ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case	
Module-3	L-1	ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು -Dative Cases, and Numerals	20
	L-2	ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal numerals and Plural markers	
	L-3	ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು ಮತ್ತು ವರ್ಣ ಗುಣವಾಚಕಗಳು Defective / Negative Verbs and Colour Adjectives	
Module-4	L-1	ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು Permission, Commands, encouraging and Urging words (Imperative words and sentences)	20
	L-2	ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು Accusative Cases and Potential Forms used in General Communication	

	L-2	."ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು Helping Verbs"iru and iralla", Corresponding Future and Negation Verbs	
	L-3	ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ Comparitive, Relationship, Identification and Negation Words	
Module-5	L-1	ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು Different types of forms of Tense, Time and Verbs	20
	L-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	
	L-3	Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation	

13.0 QUESTION BANK

Note: Fill in the blankto translating the given English word to Kannada word.

Q.1) We_____
a) avaru b)ivaru c)avlud d)naavu

Q.2) She_____
a) avanu b)adu c)avaLu d)idu

Q.3) It_____
a) naavu b)adu c)niivu d)ivaru

Q.4) You_____
a) naavu b)adu c)niivu d)ivaru

Q.5) They_____
a) avara b)avaru c)avarind d)ivaru

Note: Substitute the correct word to the under lined words in the following sentences.

Q.6) avaru huuDugar iddare
a) huDugaru b) huDuga c) huuDaga d) huDuug

Q.7) avaLu huDuugi iddaLe
a) huuDugi b) huDugi c) Girl d) Lady

Q.8) adu mani iruttade
a) home b) house c) mane d) college

Q.9) Santosh kaalejige huguttare
a) hoguttaLe b) baruttane c) hoguttane d) goining

Q.10) Ravi haasTelanalli iruttani
a) iruttaLe b) iruvaru c) iddare d) iruttane

Q.11) tande_____
a) father b) grand father c)mother d) brother

Q.12) tangi_____
a) small sister b) sister c) yonger sister d) elder sister

Note:Write the English word for the given Kannada word.
Q.13) tamma_____
a) brother b) big brother c) smallbrother d) younger brother
Q.14) snehita_____
a) geLeya b) friend c) snehite d) best friend
Q.15) shikshaka_____
a) teacher b) lecturer c) Professor d) Pricipal

Note:Fill in the blank choosing the right word from the group given below.
Q.16) avaLa_____ eenu?
a) hesaru b) hasar c) hasiru d) name
Q.17) manege_____ baa.
a) early b) late c) beega d) taDavagi
Q.18) niinuiiga_____hogidde?
a) where b) there c) ellege d) ellige
Q.19) Ravi _____ankagaLannu paDediddane.
a) heccu b) more c) hecu d) highest
Q.20) niinu snehitarige ____tegedukonDu baa.
a) haNNugaLannu b) haNNagalannu c) hannugalannu d) haNugalannu

Note:Translate the following Kannada sentences into English.
Q.21) idubyaga ide.
a) It is a bag b) It is a book c) It is a pen d) It is a compass
Q.22) nimma hesaru eenu?
a) What is it's name? b) What is your name?
c) What is that's name? d) What is his name?
Q.23) niinu haastelage beega baa.
a) you come to hostel early. b) you came to hostel early
c) you must come to hostel early d) you come fast to hostel
Q.24) nanage gaNita pustaka beeku.
a) I need not mathematics book b) I want mathematics book
c) I wanted mathematics book d) I need mathematics book
Q.25) yaaru baruttare ?
a) Who will come? b) Who will be come?
c) Who will be coming? d) Who is coming?

Note: Translate the following English words into Kannada words.
Q.26) Friend
a) snehita b) tamma c) tangi d) brother
Q.27) Home
a) college b) mane c) house d) room
Q.28) Who
a) yaruu b) yaarinda c) yaaravaru d) yaaru
Q.29) When
a) yaavaaga b) yaavadu c) yandu d) yandininda

Q.30) What
a) enu b) yantu c) yantadu d) eenu

Note: Translate the following English sentence into Kannada .
Q.31) May I go there.
a) naanu allige hogabahude b) naanualligehoguttene
c) naan uallige hogalu sadhyavide d) naan uallige hoguvaniddene
Q.32) I am writing an assignment.
a) naanu assignment bareyuvaniddene. b) naanu assignment barediddene.
c) naanu assignment bareyuttene. d) naanu assignment bareyuttiddene.

Q.33) Who told him?
a) avanige yaaru heLidaru? b) avanige yaaru heLiddare
c) avanige yaaru heLuttare d) avanige yaaru heLabahudu
Q.34) He is my friend.
a) avanu nanna snehita iddane b) avanu nanna tamma iddane
c) avaLu nanna tangi iddaLe d) avaLu nanna akka iddaLe
Q.35) She is girl
a) avaLu gruhiNi iddaLe b) avaLu huDugi iddaLe
c) avanu huDuga iddane d) avaLu tangi iddaLe

Note: Change the word as per model given. Example:avana +adu =avanadu.
Q.36) chikka
a) chikkadu b) chakkadu c) chukkadu d) chokkadu
Q.37) doDDa
a) doDDadu b) doDDudu c) doDDada d) duDDudu
Q.38) oLLeya
a) oLLayadu b) oLLeeyadu c) oLeyadu d) oLLeyadu
Q.39) keTTa
a) keTTavanu b) keTTadu c) keTadu d) keTudu
Q.40) keLagina
a) melinadu b) hindinadu c) keLaginadu d) mundinadu

Note : Transform the following words of Kannada as per the given model. Example:kaTTe+-alli kaTTeyalli
Q.41) mane
a) maniyalli b) maneyolage c) maneyalli d) manegaLalli
Q.42) toTa
a) toTadalli b)holadalli c) toTadoLage d) huudoTadalli
Q.43) bavi
a) bavigaLalli b) baviyalli c) baviyoLage d) bavinalli
Q.44) byagu
a) byaginoLage b) byaginalli c) bogiyalli d) bogiyoLage
Q.45) uuru
a) uuralli b) uurinoLage c) urinalli d) uriinalli

Note : Transform the following words to Kannada as per the given model Example: -mane-manege
Q.46) uuru

a) uurige b) uurinoLage c) uurivarige d) uroTTige

Q.47) avanu
a) avanige b) avarige c) ivarige d) avaLige

Q.48) akka
a) akkanavarige b) akkange c) avakkage d) akkanige

Q.49) naanu_____
a) nanage b) nimage c) avarige d) ivarige

Q.50) amma_____
a) ammanavarige b) ammanige c) ammaLige d) ammavarige

Prepared by Smt.B.S.Koteppagol	1st year co-ordinator	Principal

Subject Title	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Subject Code	BKSKK207	CIE Marks	50
		SEE Marks	50
Number of Lecture Hrs / Week	1	Total Marks	100
Total Number of Lecture Hrs	15	Exam Hours	1 H
Credits: 1			

FACULTY DETAILS:		
Name: Smt. B S KOTEPPAGOL	Designation: Asst. Professor	Experience: 06
No. of times course taught:7	Specialization: MA IN KANNADA	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
1	Kannada medium students	1-10 Standard	kannada Language

2.0 Course Objectives

1. ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸಿ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
3. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
4. ಕನ್ನಡ ಶಬ್ದಸಂಪತ್ತಿನ ಪರಿಚಯ ಮತ್ತು ಕನ್ನಡ ಭಾಷೆಯ ಬಳಕೆ ಹಾಗೂ ಕನ್ನಡದಲ್ಲಿ ಪತ್ರ ವ್ಯವಹಾರವನ್ನು ತಿಳಿಸಿಕೊಡುವುದು.

3.0 Course Outcomes

1. ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ.
3. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.
4. ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.

4.0 ಅಣಧಿಜ ಅಂಟಿಣಜಟಿಣ

ಘಟಕ -1 ಲೇಖನಗಳು

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

ಘಟಕ -2 ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ

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

ಘಟಕ -3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ

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

ಘಟಕ -4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ

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

ಘಟಕ -5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

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

5.0 Relevance to future subjects

Sl.No.	Semester	Subject	Topics
			-
			-

6.0 Relevance to Real World

Sl.No	Real World Mapping

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details

8.0 Books Used and Recommended to Students

Text Books
1.ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಸಮೀಕ್ಷೆ – ಎಚ್ ತಿಪ್ಪೇರುದ್ರಸ್ವಾಮಿ.
2. ಕರ್ನಾಟಕ ಗತವೈಭವ – ಆಲೂರ ವೆಂಕಟರಾಯ
3. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ರಂ. ಶ್ರೀ ಮುಗಳಿ
4. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ತ.ಸು. ಶಾಮರಾಯ
5. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ಎಲ್. ಎಸ್. ಶೇಷಗಿರಿರಾವ್.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/ Animation/ Videos Recommended

Website and Internet Contents References

10.0 Magazines/Journals Used and Recommended to Students

Sl. No	Magazines/Journals	Website

11.0 Examination Note

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 25 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 25 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 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.

12.0 Course Delivery Plan

Module	Lecture No./Practical Session	Content of Lecture	% of Portion
ಘಟಕ –1	L-1	ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ	20
	L-2	ಕರ್ನಾಟಕದ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ	
	L-3	ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ	
ಘಟಕ –2	L-1	ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ	20
	L-2	ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ,ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ	
	L-3	ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು - ಶಿಶುನಾಳ ಶರೀಫ	
ಘಟಕ –3	L-1	ಡಿವಿಜಿ ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ದ ಕೆಲವು ಭಾಗಗಳು	20
	L-2	ಕುರುಡು ಕಾಂಚಾಣ : ದಾ.ರಾ. ಬೇಂದ್ರೆ	
	L-3	ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು	
ಘಟಕ -4	L-1	ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ – ಎ. ಎನ್. ಮೂರ್ತಿರಾವ್	20
	L-2	ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ ಎನ್ ಮೂರ್ತಿರಾವ್	
	L-3	ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ	
ಘಟಕ -5	L-1	ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ	20
	L-2	ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ	
	L-3	ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	

13.0 QUESTION BANK

ಘಟಕ -1

1) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ:

1) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಲೇಖನದ ಲೇಖಕರು ಯಾರು?
2) "ಕಬ್ಬಿಗರ ಕಾವ್ಯ" ಕಾವ್ಯ ರಚಿಸಿದ ಕವಿ ಹೆಸರು ಏನು?
3) ಕನ್ನಡದ ಮೊದಲ ಉಪಲಬ್ಧ ಗ್ರಂಥ ಯಾವುದು?
4) ಮಹಾಸತಿ ಎಂದರೆ ಯಾರು?
5) ವಿಜಯನಗರದ ಪ್ರಸಿದ್ಧ ದೊರೆ ಯಾರು ?
6) ಪಂಪ ರಚಿಸಿದ ಕೃತಿಗಳನ್ನು ಹೆಸರಿಸಿ?
7) "ಭರತೇಶ ವೈಭವ' ರಚಿಸಿದ ಕವಿ ಯಾರು?
8) ಹಂಪ ನಾಗರಾಜಯ್ಯ ಜನಿಸಿದ ಊರು ಯವುದು?
9) ಕವಿರಾಜಮಾರ್ಗದ ಕರ್ತೃ ಯಾರು?
10) ಹಂಪ ನಾಗರಾಜಯ್ಯ ಪಡೆದ ಕನ್ನಡದ ಪ್ರತಿಷ್ಠಿತ ಪ್ರಶಸ್ತಿ ಯಾವುದು?

2. ಕರ್ನಾಟಕದ ಏಕೀಕರಣ ; ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ:

1. ಕರ್ನಾಟಕ ಏಕೀಕರಣ ; ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ. ಇದರ ಲೇಖಕರ ಹೆಸರೇನು?
2. ಪ್ರೊ.. ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯನವರ ಜನ್ಮ ಸ್ಥಳ ಯಾವುದು?
3. 'ಇಗೊ ಕನ್ನಡ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
4. ಕರ್ನಾಟಕ ಏಕೀಕರಣ ಎಂದರೇನು?
5. ಸರ್. ಥಾಮಸ್ ಮನ್ರೋ ಯಾರು?
6. ಯಾರ ಪ್ರಯತ್ನದಿಂದ 1890ರಲ್ಲಿ ವಿದ್ಯಾವರ್ಧಕ ಸಂಘ ಸ್ಥಾಪನೆಯಾಯಿತು?
7 'ಕರ್ನಾಟಕ ಗತವೈಭವ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
8. ಕರ್ನಾಟಕ ಏಕೀಕರಣವಾದ ವರ್ಷ ಯವುದು?
9. ಮೈಸೂರ ರಾಜ್ಯಕ್ಕೆ ಕರ್ನಾಟಕವೆಂದು ನಾಮಕರಣ ಮಾಡಿದ ವರ್ಷ ಯವುದು?
10. 1955ರಲ್ಲಿ ರಾಯಚೂರಿನಲ್ಲಿ ನಡೆದ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಸಮ್ಮೇಳನದ ಅಧ್ಯಕ್ಷರು ಯಾರಾಗಿದ್ದರು?

3. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ

ವಸ್ತು ನಿಷ್ಠ ಪ್ರಶ್ನೆಗಳು

1) ಜಗತ್ತಿನಲ್ಲಿ ಹೆಚ್ಚು ಮಂದಿ ಮಾತನಾಡುವ ಭಾಷೆಯೆಂಬ ನೆಲೆಯಲ್ಲಿ ಕನ್ನಡಕ್ಕೆ ಎಷ್ಟನೇ ಸ್ಥಾನ ಸಿಕ್ಕಿದೆ?
2) ಕನ್ನಡ ಭಾಷೆ ಯಾವ ಲಿಪಿಯಿಂದ ರೂಪಗೊಂಡಿದೆ?
3) ವಿನೋಬಾ ಭಾವೆಯವರು ಕನ್ನಡ ಭಾಷೆಯ ಲಿಪಿಯನ್ನು ಏನೆಂದು ಕರೆದಿದ್ದಾರೆ?
4) ಸಂವಿಧಾನದ ಎಷ್ಟನೇ ಅನುಚ್ಛೇದದ ಪ್ರಕಾರ ಆಯಾ ರಾಜ್ಯಗಳಲ್ಲಿ ಬಳಕೆಯಾಗುವ ಭಾಷೆಗಳನ್ನೇ ಆಡಳಿತ ಭಾಷೆಯೆಂದು ತೀರ್ಮಾನಿಸಲಾಗಿದೆ?

5) ಯಾವ ವರ್ಷದಲ್ಲಿ ಸಾರ್ವತ್ರಿಕವಾಗಿ ನ್ಯಾಯಾಲಯಗಳ ತೀರ್ಪಿನ ಭಾಷೆ ಕನ್ನಡವೇ ಆಗಿರಬೇಕೆಂದು ಅಂತಿಮ ಆಜ್ಞೆ ಹೊರಡಿಸಲಾಯಿತು?

ಘಟಕ -2

ಆಧುನಿಕ ಪೂರ್ವ ಕಾವ್ಯ ಭಾಗ

1. ವಚನಗಳು:

1. ಕನ್ನಡದ ಮೊದಲ ಆದ್ಯ ವಚನಕಾರ ಯಾರು?
2. ಜೇಡರ ದಾಸಿಮಯ್ಯನ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
3. ಜೇಡರ ದಾಸಿಮಯ್ಯ ಅಳಿಮನದವನ ಭಕ್ತಿಯನ್ನು ಯಾವುದಕ್ಕೆ ಹೋಲಿಸಿದ್ದಾರೆ?
4. ಅಲ್ಲಮ ಪ್ರಭುಗಳ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
5. ಮೃತ್ಯುವಿನ ಬಾಯಿಗೆ ತುತ್ತಾದವರು ಯಾರು ಎಂದು ಅಲ್ಲಮ ಪ್ರಭುಗಳು ಹೇಳಿದ್ದಾರೆ?
6. ಬಸವಣ್ಣನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
7. .ಬಸವಣ್ಣನವರು ಮರಹು ಘನವಾದರೂ ಯಾವುದನ್ನು ಕಿರಿಯದೆನ್ನಬಾರದೆಂದು ಹೇಳಿದ್ದಾರೆ?
8. ಅಕ್ಕಮಹಾದೇವಿಯ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
9. ಚನ್ನಮಲ್ಲಿಕಾರ್ಜುನ ಯಾರನ್ನು ನರಕದಲ್ಲಿಕ್ಕದೆ ಬಿಡುವುದಿಲ್ಲವೆಂದು ಅಕ್ಕಮಹಾದೇವಿ ಹೇಳಿದ್ದಾಳೆ?
10. ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
11. ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
12. ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ ಯಾರಿಗೆ ಬಡತನವಿಲ್ಲ ಎಂದು ಹೇಳಿದ್ದಾಳೆ?

2. ಕೀರ್ತನೆಗಳು:

1) ಪುರಂದರದಾಸರ ಕೀರ್ತನೆಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
2) 'ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ' ಕೀರ್ತನೆ ರಚಿಸಿದ ದಾಸರ ಹೆಸರೇನು?
3) ಕನಕದಾಸರ ಕೀರ್ತನೆಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
4)'ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೆ' ಕೀರ್ತನೆ ರಚಿಸಿದ ದಾಸರ ಹೆಸರೇನು?

3. ತತ್ಪದಗಳು (ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು)

1) 'ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು' ಈ ತತ್ವಪದವನ್ನು ರಚಿಸಿದವರು ಯಾರು?

ಘಟಕ -3

ಆಧುನಿಕ ಕಾವ್ಯ ಭಾಗ

1. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ

1) ಡಿ.ವಿ.ಜಿ. ಯವರು ಎಲ್ಲಿ ಮತ್ತು ಯಾವಗ ಜನಿಸಿದರು?
2) 'ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
3) ಪದ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿ
   ಹುಲ್ಲಾಗು ಬೆಟ್ಟದಡಿ, ಮನೆಗೆ _____ ಯಾಗು ।
   ಕಲ್ಲಾಗು ಕಷ್ಟಗಳ ಮಳೆಯ ವಿಧಿ ಸುರಿಯೆ ॥

   _____ ।
   ಎಲ್ಲರೊಳಗೊಂದಾಗು ಮಂಕುತಿಮ್ಮ ॥
4) ಹೊಸಚಿಗುರು ಹಳೆ ಬೇರು ಕೂಡಿರಲು _____

2. ಕುರುಡು ಕಾಂಚಾಣಾ

1) ದ. ರಾ. ಬೇಂದ್ರೆಯವರ ಪೂರ್ಣ ಹೆಸರೇನು?
2) ದ. ರಾ. ಬೇಂದ್ರೆಯವರು ಎಲ್ಲಿ ಜನಿಸಿದರು?
3) ದ. ರಾ. ಬೇಂದ್ರೆಯವರ ಕಾವ್ಯನಾಮ ಯಾವುದು?
4) ಬೇಂದ್ರೆಯವರ ಯಾವ ಕವನ ಸಂಕಲನಕ್ಕೆ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿ ಲಭಿಸಿದೆ?
5) ಕುರುಡು ಕಾಂಚಾಣಾ ಕವನವನ್ನು ಯಾವುದರಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
6) ಪದ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿ
   ಕುರುಡು ಕಾಂಚಾಣಾ ಕುಣಿಯುತಲಿತ್ತು
   _____
   ಕುರುಡು ಕಾಂಚಾಣ.

3. ಹೊಸಬಾಳಿನ ಗೀತೆ

1) ಕುವೆಂಪುರವರು ಎಲ್ಲಿ ಮತ್ತು ಯಾವಗ ಜನಿಸಿದರು?
2) ಕುವೆಂಪುರವರ ಪೂರ್ಣ ಹೆಸರೇನು?
3) ಕುಪ್ಪಳ್ಳಿ ವೆಂಕಟಪ್ಪ ಪುಟ್ಟಪ್ಪನವರ ಕಾವ್ಯನಾಮ ಯಾವುದು?
4) 'ಹೊಸಬಾಳಿನ ಗೀತೆ' ಕವನವನ್ನು ಯಾವುದರಿಂದ ಆರಿಸಿಕೊಳ್ಳಲಾಗಿದೆ?
5) 'ನೆನಪಿನ ದೋಣಿ' ಇದು ಯಾರ ಆತ್ಮ ಚರಿತ್ರೆ?
6) 'ರಾಷ್ಟ್ರಕವಿ' ಪ್ರಶಸ್ತಿ ಪಡೆದ ಕವಿ ಯಾರು?
7) ಕುವೆಂಪುರವರ ಯಾವ ಕಾವ್ಯಕ್ಕೆ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿ ಲಭಿಸಿದೆ?
8) ಕಾನೂರು ಹೆಗ್ಗಡತಿ ಕಾದಂಬರಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
9) 'ರಸಋಷಿ' ಎಂದು ಕರೆಯಿಸಿಕೊಂಡ ಕವಿ ಯಾರು?

ಘಟಕ -4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ

1. ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ – ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ

ಪ್ರಶ್ನೆ 1) ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ – ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ ಲೇಖನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಎ.ಎನ್.ಮೂರ್ತಿರಾವ್‌ರ ಪೂರ್ಣ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 3) 'ಚಿತ್ರಗಳು ಪತ್ರಗಳು' ಎಂಬ ಕೃತಿಗೆ ಯಾವ ಪ್ರಶಸ್ತಿ ದೊರೆತಿದೆ?
ಪ್ರಶ್ನೆ 4) 'ಸಂಜೆ ಗಣ್ಣಿನ ಹಿನ್ನೋಟ' ಆತ್ಮಚರಿತ್ರೆ ಕೃತಿ ಬರೆದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 5) 'ಕೃಷ್ಣರಾಜಸಾಗರ ಕಣ್ಣಂಬಾಡಿ ಆಣೆಕಟ್ಟನ್ನು ಕಟ್ಟಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 6) ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಯಾವ ರಾಜ್ಯ ಮನೆತನದಲ್ಲಿ ದಿವಾನರಾಗಿ ಕೆಲಸ ಮಾಡಿದರು?
ಪ್ರಶ್ನೆ 7) ಮೈಸೂರು ದಿವಾನರ ಹುದ್ದೆಗೆ ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ರಾಜಿನಾಮೆ ನೀಡಲು ಕಾರಣವಾದ ವರದಿ
ಪ್ರಶ್ನೆ 8) ಸರ್. ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಹುಟ್ಟೂರು ಯಾವುದು?
ಪ್ರಶ್ನೆ 9) ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಪ್ರಯಾಣ ಹೊರಟ್ಟಿದ್ದಾಗ ಅವರ ಸೂಟ್ಕೇಸನಲ್ಲಿ ಯಾವ ಪುಸ್ತಕ ಇರುತಿತ್ತು?
ಪ್ರಶ್ನೆ 10) ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರಿಗೆ 'ಸರ್' ಪದವಿ ನೀಡಿ ಗೌರವಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 11) ನಾಲ್ವಡಿ ಕೃಷ್ಣರಾಜ ಒಡೆಯರು ನೇಮಿಸಿದ ಆಯೋಗ ಯಾವುದು?
ಪ್ರಶ್ನೆ 12) ಮಂಡ್ಯ ಜಿಲ್ಲೆಯಲ್ಲಿ ಅನ್ನಬ್ರಹ್ಮಣ ಅವತಾರ ಮಾಡಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 13) ಭದ್ರಾವತಿ ಕಬ್ಬಿನ ಮತ್ತು ಉಕ್ಕಿನ ಕಾರ್ಖಾನೆ ನಿರ್ಮಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 14) ಕೈಗಾರೀಕರಣ ಆಗದೆ ಇದ್ದರೆ ಭವಿಷ್ಯದ ಭಾರತಕ್ಕೆ ಮತ್ತು ನಮ್ಮ ನಾಡು ಕರ್ನಾಟಕಕ್ಕೆ ಉಜ್ವಲ ಭವಿಷ್ಯವಿಲ್ಲ ಎಂಬ ಮಾತನ್ನು ಹೇಳಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 15) ಕೈಗಾರಿಕೆಗಳನ್ನು ಬೆಳೆಸದಿದ್ದರೆ ಭಾರತಕ್ಕೆ ಉಳಿಗಾಲವಿಲ್ಲ ಎಂದು ಮನಗಂಡವರು ಯಾರು?
ಪ್ರಶ್ನೆ 16) 'ಭಾರತ ರತ್ನ' ಪ್ರಶಸ್ತಿ ಪಡೆದ ಕನ್ನಡದ ಮೊದಲ ವ್ಯಕ್ತಿ ಯಾರು?

2. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ

ಪ್ರಶ್ನೆ 1) ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ ಲೇಖನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಭಾರತೀಯ ಕರಕುಶಲ ಕಲೆಗಳಿಗೆ ಯಾವ ಕಾಲದಿಂದ ಅಪಾರ ಬೇಡಿಕೆ ಇದೆ?
ಪ್ರಶ್ನೆ 3) ಭಾರತದಿಂದ ರಫ್ತಾಗುತ್ತಿದ್ದ ವಿವಿಧ ಬಗೆಯ ಕರಕುಶಲ ವಸ್ತುಗಳ ಬಗ್ಗೆ ವಿದೇಶಿ ಬರಹಗಳಲ್ಲಿ ಪ್ರಸ್ತಾಪಿಸಿರುವ ಬರಹಗಾರರುಗಳು ಯಾರು?
ಪ್ರಶ್ನೆ 4) ಭಾರತದಲ್ಲಿ ಬೇರೆ ಬೇರೆ ಬಣ್ಣಗಳನ್ನು ನೀಡುವ ಸುಮಾರು ಎಷ್ಟು ಗಿಡಗಳಿವೆ?

ಘಟಕ -5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

1. ಯುಗಾದಿ

ಪ್ರಶ್ನೆ 1) ಯುಗಾದಿ ಕಥೆಯನ್ನು ಬರೆದ ಕಥೆಗಾರರ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 2) ವಸುಧೇಂದ್ರ ಕಥೆಗಾರರು ಎಲ್ಲಿ ಜನಿಸಿದರು?
ಪ್ರಶ್ನೆ 3) ಯುಗಾದಿ ಕಥೆಯಲ್ಲಿಯ ಎರಡು ಮುಖ್ಯ ಪಾತ್ರಗಳು ಯಾವುವು?

ಪ್ರಶ್ನೆ 4) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ಹೆಂಡತಿಯ ಹಸರೇನು?
ಪ್ರಶ್ನೆ 5) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ಸ್ನೇಹಿತನ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 6) ಪ್ರಹ್ಲಾದ ಯಾವ ಕಂಪನಿಯಲ್ಲಿ ಕೆಲಸ ಮಾಡುತ್ತಿದ್ದ?
ಪ್ರಶ್ನೆ 7) ಪ್ರಹ್ಲಾದನ ಪತ್ನಿಯ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 8) 'ರೂಢಿಯನ್ನು ಕಟ್ಟುವುದು ಕಷ್ಟ ; ಮುರಿಯುವುದೂ ಇನ್ನೂ ಕಷ್ಟೆ ; ಮರೆಯುವುದಂತೂ ಇನ್ನೂ ಕಷ್ಟ ! ಈ ಮಾತು ಯಾವ ಕಥೆಯಲ್ಲಿ ಬಂದಿದೆ?
ಪ್ರಶ್ನೆ 9) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ವಿದ್ಯಾರ್ಥಿನಿಯ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 10) ಕಾಸಿಂಸಾಬನ ಮಗ ಯಾರು? ಇಸ್ಮಾಯಿಲ್.

2. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ

ಪ್ರಶ್ನೆ 1) ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ_ಪ್ರವಾಸ ಕಥನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಹಂಪಿ ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಪತಿಯಾಗಿ ಸೇವೆ ಸಲ್ಲಿಸಿದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 3) ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ_ಪ್ರವಾಸ ಕಥನವನ್ನು ಯಾವ ಪ್ರವಾಸ ಕಥನ ಕೃತಿಯಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
ಪ್ರಶ್ನೆ 4) ಜಾನಪದ ಅಕಾಡೆಮಿಯ ಅಧ್ಯಕ್ಷರು ಯಾರು?
ಪ್ರಶ್ನೆ 5) ಸಂಗೀತ ಪುರವು ಈ ಹಿಂದೆ ಯಾರ ಊರಾಗಿತ್ತು?
ಪ್ರಶ್ನೆ 6) ನಾಗವಳ್ಳಿ ಮತ್ತು ಹಾಡುವಳ್ಳಿಗಳ ಸುತ್ತಮುತ್ತಲಿನ ದಟ್ಟ ಕಾಡಿನ ಒಡಲೊಳಗೆ ವಾಸವಾಗಿರುವ ಜನಾಂಗದ ಹೆಸರೆನು?
ಪ್ರಶ್ನೆ 7) ಲೇಖಕರ ಗುಂಪಿನ ಮಾರ್ಗದರ್ಶಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 8) ಮೆಗಾನೆ ಗ್ರಾಮದಲ್ಲಿ ವಾಸವಾಗಿರುವ ಬುಡಕಟ್ಟು ಜನಾಂಗದ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 9) ಕುಣಬಿ ಜನಾಂಗದವರು ಮೂಲತ; ಯಾವ ರಾಜ್ಯದ ಹಿನ್ನೆಲೆಯನ್ನು ಹೊಂದಿದ್ದಾರೆ?

ಪ್ರಶ್ನೆ 10) ಕುಣಬಿ ಜನಾಂಗದವರ ಮುಖ್ಯವಾದ ಹಬ್ಬ ಯಾವುದು?
ಪ್ರಶ್ನೆ 11) ಹಾಡಿಯ (70 ವರ್ಷದ) ಯಜಮಾನ ಯಾರು?
ಪ್ರಶ್ನೆ 12) ತಾಳಗುಪ್ಪದ ಗಿರಿಜನ ಆಶ್ರಮ ಶಾಲೆಯ ಮಾಸ್ತರ ಯಾರು?
ಪ್ರಶ್ನೆ 13) 'ಗೂಬೆ ಕೂರಿಸು' ಪದದ ಅರ್ಥ
ಪ್ರಶ್ನೆ 14) ಹಾಡಳ್ಳಿಗೆ ಹಿಂದೆ ಯಾವ ಹೆಸರಿನಿಂದ ಕರೆಯುತ್ತಿದ್ದರು?

Prepared by Smt.B.S.Koteppagol	6/3/24. 1st year co-ordinator	Principal

Subject Title	**INNOVATION and DESIGN THINKING**		
Subject Code	BIDTK258	**CIE(50)+SEE(50)**	100
Number of Lecture Hrs/Week	1L	**Exam Marks(appearing for)**	100 & reduced to 50 for grade
Total Number of Lecture Hrs	15	**Exam Hours**	01 per division
CREDITS – 01			

FACULTY DETAILS:		
Name: Dr.S.N.Topannavar (Divisions B-ECE)	**Designation:** Professor & Head	**Experience:** 26 years
No. of times similar course taught:03	**Specialization:**Thermal Power Engineering	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	Any	PUC level	Reasoning, Analytical & Critical thinking abilities

2.0 Course Objectives

- To explain the concept of design thinking for product and service development
- To explain the fundamental concept of innovation and design thinking
- To discuss the methods of implementing design thinking in the real world.

3.0 Course Outcomes

CO	Course Outcome	RBTL	POs
C109.1	Appreciate various design process procedure	L2	PO1-PO7, PO9, PO11 & PO12
C109.2	Generate and develop design ideas through differenttechnique	L2	PO1-PO7, PO9, PO11 & PO12
C109.3	Identify the significance of reverse Engineering to Understand products	L2	PO1-PO7, PO9, PO11 & PO12
C109.4	Draw technical drawing for design ideas	L3	PO1-PO7, PO9, PO11 & PO12
C109.5	Empathizing prototyping & testing	L1	PO1-PO7, PO9, PO11 & PO12

4.0 University Course Content

Module-1
PROCESS OF DESIGN
Understanding Design thinking
Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping
Module-2
Tools for Design Thinking
Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design

Module-3

Design Thinking in IT :

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

Module-5

Design thinking workshop:

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

5.0 Relevance to future Subjects/Lab/Project

Sl. No	Semester	Subject/Lab/Project	Topics
01	All Sem	Subjects, labs and Project include Design & development of engineering systems. Solving of complex engineering problems through innovations through multidisciplinary concepts Business modeling and prototyping	All modules

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Resolving real time problems and issues by innovation and design thinking
02	Solving of complex engineering problems through innovations through multidisciplinary concepts
03	Business modeling and prototyping

7.0 Gap Analysis and Mitigation

Sl. No	Gap/s	Mitigation
01	Ability to think, design and complete project	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
02	Ability to develop ideas and convert them to product	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
03	Ability to make prototype and analyze	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
04	Ability to resolve real-time problems with available resources	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.

8.0 Books Used and Recommended to Students

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. HassoPlattner, ChristophMeinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
4. IdrisMootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

References

5. YousefHaik 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).

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

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

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

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

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	Elsevier	https://www.journals.elsevier.com
2	Journal of Composite Materials	http://journals.sagepub.com
3	Journal of Manufacturing Science and Engineering	http://manufacturingscience.asmedigitalcollection.asme.org
4	International Journal of Renewable Energy Research (IJRER)	http://www.ijrer.org

11.0 Examination Note

Methods of CIE need to be defined topic wise i.e.- Tests, MCQ, Quizzes, Seminar or micro project/Course Project, Term Paper)
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 35% of maximum marks in SEE and a minimum of 40% of maximum marks in CIE. Semester End Exam (SEE) is conducted for 100 marks (3 hours' duration) and scaled down to 50 marks. Based on this grading will be awarded.
The student has to score 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.

12.0 Course Delivery Plan

Module	Content of Lecturer	Delivery	Cumulative Coverage

1	Understanding Design thinking: Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping	Chalk & Talk & Video of live examples	20%
2	Tools for Design Thinking: Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design	Chalk & Talk, Case Studies & Video of live examples	40%
3	Design Thinking in IT: Design Thinking to Business Process modeling – Agile in Virtual collaboration environment – Scenario based Prototyping	Case Studies & Simulation	60%
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.	Business Models, Presentation and Live Projects	80%
5	Design thinking workshop: Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test	Presentation	100%

13.0 Continuous Internal Evaluation (CIE)

Module	CIE Method	Marks	Conduction
1,2,3,4 &5	3 IA Tests Duration:1 hour	Conduction for 50 marks & reduced to 20 marks	I IA-5th week, II IA-10th week & III IA-15th week
	2 Assignments	Each assignment evaluation for 25 marks & average of all assignments shall be reduced to 10 marks	I Asignment-4thweek &II Assignment-9th week
	Report writing or presentation or Seminar or GD	Each activity shall be evaluated for 50 marks with proper rubrics and average of all evaluations shall be reduced to 20 marks	13th week

Module	Topic	CIE Method
1	Understanding Design Thinking	MCQ/Term paper
2	Tools for Design Thinking	MCQ/Case Study Presentation Evaluation/Simulation Evaluation
3	Design Thinking in IT	MCQ/Case Study Presentation Evaluation/Simulation Evaluation
4	DT for Strategic Innovations	Seminar presentation on design/ micro-project on design thinking
5	Design Thinking Workshop	Workshop presentation/Course project

13.0 Semester End Examination (SEE)

VisvesvarayaTechnological University will conduct the MCQ SEE for maximum for 50 marks. There will be 50 questions carrying 01mark each. The duration of the SEE will be 1hour.

15.0 QUESTION BANK (to be prepare)

16.0 University Result

VTU Examination	S+	S	A	B	C	D	E	F	% Passing
Dec.21-Jan.22 VTU SEE									100
FEB-MARCH 2023 VTU SEE									100

Prepared by	Checked by		
Dr.S.N.Topannavar	Module Coordinator	HOD	Principal

Subject Title	Mathematics-II for Electrical & Electronics Engineering Stream		
Subject Code	BMATE201	IA Marks	50
Number of Lecture Hrs / Week	04	Exam Marks	50
Total Number of Lecture Hrs	40	Exam Hours	03
		CREDITS – 04	

FACULTY DETAILS:		
Name: Prof. 1) Dr. S .L Patil 2) Prof. S .A. Patil 3) Prof. S .S Thabaj 4) Prof. I. N. Kambar	**Designation** 1) Asst.Prof. 2) Asst.Prof. 3) Asst.Prof. 4) Asst.Prof	**Experience:** 1) 14.9 years 2) 11 years 3) 11 years 4) 1.6 years
No. of times course taught: 1) 02 (including present) 2) 02 3) 02 4)02	**Specialization:** Mathematics	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	First Year Engineering	I	Calculus and Linear Algebra

2.0 Course Objectives

This course viz., Advanced Calculus and Numerical Methods aims to prepare the students:

- **Familiarize** the importance of Integral calculus and Vector calculus essential for electronics
- **Analyze** electronics and electrical engineering problems by applying Partial Differential Equations.
- **Develop** the knowledge of solving electronics and electrical engineering problems numerically.

3.0 Course Outcomes

Having successfully completed this course, the student will be able to

	Refined Course Outcome	Cognitive Level	POs
C201.1	Understand the applications of vector calculus refer to Solenoidal, irrotational vectors, line integral and surface integral.	L1, L2,L3	1,2,4,12
C201.2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation	L1, L2,L3	1,2,4,12
C201.3	To understand the concept of Laplace transform and to solve initial value problems.	L1, L2,L3	1,2,4,12
C201.4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.	L1, L2,L3	1,2,4,12
C201.5	Get familiarize with modern mathematical tools namely SCILAB/PYTHON/MATLAB	L1, L2,L3	1,2,4,12

4.0 Course Content

Module – 1
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 and problems.

Vector Integration: Line integrals, Surface integrals. Applications to work done by a force and flux. Statement of Green's theorem and Stokes theorem. Problems**.** **(RBTL: L1, L2 and L3) (8 Hours)**

Self-Study: Volume integral and Gauss divergence theorem.
Applications: Conservation of laws, Electrostatics, Analysis of streamlines and electric potentials.

Module – 2
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. **(RBTL: L1, L2 and L3) (8 Hours)**

Self-study: Angles and Projections. Rotation, reflection, contraction and expansion.
Applications: Image processing, AI & ML, Graphs and networks, computer graphics.

Module – 3
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. **(RBTL: L1, L2 and L3) (8 Hours)**

Self-Study: Verification of convolution theorem.
Applications: Signals and systems, Control systems, LR, CR & LCR circuits.

Module –4
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.

(RBTL: L1, L2 and L3) (8 Hours)

Module –5

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 - Taylors series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor corrector formula (No derivations of formulae), Problems. **(RBTL: L1, L2 and L3) (8 Hours)**

Self-Study: Adam-Bashforth method.

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

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	III	Electrical and Electronics Engineering stream	Signals and systems, Control systems, LR, CR & LCR circuits, Electrostatics, Analysis of streamlines and electric potentials, Image processing, AI & ML, Graphs and networks, Computer graphics

6.0 Relevance to Real World

Sl. No	Real World Mapping
01	Vector calculus is used in electromagnetic fields, gravitational fields, and fluid flow. Vector integration is used in Electromagnetic field, Gravitational field, fluid flow.
02	Image processing, AI & ML, Graphs and networks, computer graphics.
03	Laplace transform are used in various areas of physics, electrical engineering, control engineering, optics, mathematics and signal processing. Laplace Transform is widely used by electronic engineers to solve quickly differential equations occurring in the analysis of electronic circuits
04	Estimating the approximate roots, extremum values, Area, volume, and surface area.
05	Numerical Methods are used in all fields of engineering and the physical sciences, life sciences, social sciences, medicine, business and even the arts have adopted elements of scientific computations.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Integrals

8.0 Books Used and Recommended to Students

Text Books
1. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, 44th Ed., 2021.
2. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed. (Reprint), 2018.

Reference Books

1. N.P.Bali and Manish Goyal: A Text Book of Engineering Mathematics, Laxmi Publishers, Latest edition 10th Ed., 2022..
2. B.V.Ramana: "Higher Engineering Mathematics" 11th Edition, Tata McGraw-Hill, 11th Ed, 2017
3. H. K. Dass and Er. RajnishVerma: "Higher Engineerig Mathematics", S. Chand publishing, 3rd edition, 2014.
4. C. Ray Wylie, Louis C. Barrett: "Advanced Engineering Mathematics" , McGraw – Hill
5. **James Stewart: "**Calculus" Cengage publications, 7th edition, 2019.
6. Srimanta Pal & Subobh C Bhunnia: "Engineering Mathematics", Oxford University Press, 3rd Reprint, 2016.
7. Gupta C.B., Singh S.R. and Mukesh Kumar: "Engineering Mathematics for I & II ", McGraw-Hill Education (India) Pvt. Ltd., 2015.
8. **David C Lay:** "Linear Algebra and its Applications", Pearson Publishers, 4th Ed., 2018.
9. **Gareth Williams:** "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6th Ed., 2017.

Additional Study material & e-Books

1.CRC Standard Mathematical Tables and Formulae, 32nd Edition
2.A Student's Guide to the Study, Practice, and Tools of Modern Mathematics- Bindner, Donald
3 .P.N.Wartikar & J.N.Wartikar -Applied Mathematics (Volume I & II) Pune Vidyarthi Griha Prakashan, 7thEdition 1994.
4. Peter V.O'Neil – Advanced Engineering Mathematics, Thomson Brooks/Cole, 7th Edition, 2011.
5. Glyn James – Advanced Modern Engineering Mathematics, Pearson Education, 4th Edition, 2010.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

1. http://nptel.ac.in/courses.php?disciplineID=111
2. http://wwww.khanacademy.org/
3. (MOOCs)
4.http://academicearth.org/
5.VTU EDUSAT Program
6. VTU e-Shikshana Program

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	+ Plus Magazine	https://plus.maths.org/issue44.
2	Mathematics Magazine	www.mathematicsmagazine.com

11.0 Examination Note

Assessment Details (both CIE and SEE)

The weight age 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). 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:

Three Unit Tests each of **20 Marks (duration 01 hour**)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester

5. Second assignment at the end of 9th week of the semester
Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks** (**duration 01 hours**)
6. At the end of the 13th week of the semester
The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**
(to have 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 /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 the subject (**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.
The students have to answer 5 full questions, selecting one full question from each module

12.0 Course Delivery Plan

Module	Lecture No.	Content of Lecturer	% of Portion
1	1	Scalar and vector fields	20
	2	Gradient, directional derivatives	
	3	Curl and divergence-physical interpretation	
	4	Solenoidal and Irrotational vector fields	
	5	Line integrals	
	6	Green Theorem	
	7	Stokes Theorem	
	8	Applications to work done by a force and flux	
2	9	Definition and examples, subspace, linear span	20
	10	Linearly independent and dependent sets	
	11	Basis and dimension	
	12	Linear transformations: Definition and examples	
	13	Algebra of transformations, Matrix of a linear transformation. Change of coordinates	
	14	Rank and nullity of a linear operator	
	15	Rank-Nullity theorem	
	16	Inner product spaces and Orthogonality	
3	17	Existence and Uniqueness of Laplace transform (LT)	20
	18	transform of elementary functions, region of convergence	
	19	Properties–Linearity, Scaling, t-shift property, s-domain shift	
	20	differentiation in the s-domain, division by t, differentiation and integration in the time domain	
	21	LT of special functions periodic functions	
	22	Heaviside Unit step function, Unit impulse function.	
	23	Inverse Laplace Transforms: Definition, properties, evaluation using different methods	
	24	Convolution theorem (without proof), problems, and Applications to solve ODE.	

4	25	Solution of polynomial and transcendental equations	20
	26	Finite differences: Forward & backward differences	
	27	Newton's forward and backward interpolation formulae	
	28	Problems	
	29	Divided differences- Newton's divided difference formula	
	30	Lagrange's interpolation	
	31	Numerical integration: Simpson's one third rule	
	32	Simpson's three eighth rule	
5	33	Numerical solution of ODE of first order & first degree	20
	34	Taylor's series method & Problems.	
	35	Modified Euler's method & Problems	
	36	Problems	
	37	Runge -Kutta method of fourth order & Problems	
	38	Problems	
	39	Milne's predictor and corrector method	
	40	Problems	

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: University Questions	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 1&2 of the syllabus	6	Individual Activity.	Book 1, of the reference list. Website of the Reference list
2	Assignment 2: University Questions	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 3,4 & 5 of the syllabus	11	Individual Activity.	Book 1, 2 of the reference list. Website of the Reference list

14.0 QUESTION BANK

Module-1:

1. Find div F & curl F if F = □ ($x^3 + y^3 + z^3$-3xyz)
2. If $\emptyset = x^2 + y^2 + z^2$ and $\vec{F}=x^2\vec{i}+y^2\vec{j}+z^2\vec{k}$,then find grad$\emptyset$,div$\vec{F}$ and curl $\vec{F}$
3. Find the value of the constants a, b &c such that the vector field,

   $\vec{F} = (x + y + az)i + (bx + 2y - z)j + (x + cy + 2z)k$ is irrotational and hence find a scalar
4. If $u = x^2\hat{i} + y^2\hat{j} + z^2\hat{k}$ & v= yzî + xzĵ +yxk̂ then prove that $\vec{u} \times \vec{v}$ is a Solenoidal vector
5. Prove that $div(\emptyset\vec{A}) = \emptyset(\text{ div } \vec{A}) + \text{ gra } \emptyset \cdot \vec{A}$
6. Prove that curl(grad$\emptyset$) = 0
7. Prove that div curl F=$\nabla . \nabla \times F = 0$
8. If $u = x^2\hat{i} + y^2\hat{j} + z^2\hat{k}$ & v= yzî + xzĵ +yxk̂ then prove that $\vec{u} \times \vec{v}$ is a Solenoidal vector
9. If $\vec{v} = \vec{w} \times \vec{r}$, prove that curl $\vec{v} = 2\vec{w}$ where $\vec{w}$ is a constant vector
10. Verify the Greens theorem $\oint_c$□ $(xy + y^2)dx + x^2dy$ where c is the closed curve of the region bounded by $y = x$ & $y = x^2$
11. Find the area between the parabola $y^2 = 4x$ and $x^2 = 4y$ with the help of Greens theorem in a plane.

12. Verify the Stroke's theorem for the vector function $\vec{F} = 2xyi + (x^2 - y^2)j$ over the circle $x^2 + y^2 = 1$, z = 0
13. Evaluate $\int_c^{\square} xy\,dx + xy^2dy$. by Stroke's theorem where c is the square in x y-plane with (1, 0), (-1, 0), (0,1) & (0, -1)

Module-2:

1. The set w of ordered triads $(a_1, a_2, 0)$, $a_1, a_2 \in F$ is a subspace of $v_3(F)$
2. Prove that the set of all solutions (a, b, c) of the equation $a + b + 2c = 0$ is a subspace of $v_3(R)$
3. Show that the set w of the elements of the vector space $v_3(R)$ of the form $x + 2y, y, x + 3y$: $x, y \in R$ is a subspace of $v_3(R)$
4. Find Null Space, Range, Rank & Nullity of the linear transformation $T: R^2 \to R^3$ defined by $T(x, y) = (x + y, x - y, y)$
5. If $T: R^3 \to R^2$ be a linear transformation defined by $T(x_1, x_2, x_3) = (x_1 - x_2,\ x_1 + x_3)$. Find the rank (T) and Nullity (T).
6. Verify Rank Nullity Theorem for the linear transformation $T: R^3 \to R^3$ defined by $T(x, y, z) = (x - y, 2y + z, x + y + z)$
7. If α and β are orthogonal unit vectors (that is $\{\alpha, \beta\}$ is an orthogonal set), what is the distance α and β
8. Prove that two vectors α and β in a real inner product space are orthogonal iff $\|\alpha + \beta\|^2 = \|\alpha\|^2 + \|\beta\|^2$
9. Two vectors α and β in a complex inner product space are orthogonal iff $\|a\alpha + b\beta\|^2 = \|a\alpha\|^2 + \|b\beta\|^2$ for all pairs of scalar a & b.
10. If α and β are vectors in a real inner product space and if $\|\alpha\| = \|\beta\|$ then $\alpha - \beta$ and $\alpha + \beta$ are orthogonal

Module-3:

1. Find the Laplace Transform of $sin2t\ sin3t$. & $sin^3 2t$.
2. Find $L\ (e^3 t sin2t)$ & $L(e^{4t}\ sin2t\ cost)$.
3. Find $L\left(\frac{1-e^t}{t}\right)$ & $L[\frac{cosat-cosb}{t}]$
4. Using unit step function find LT of $f(t) = \begin{cases} \sin t, & 0 < t < \pi \\ \sin 2t, & \pi < t < 2\pi \\ \sin 3t, & t > 2\pi \end{cases}$
5. Express $f(t) = \begin{cases} \cos t, & 0 < t < \pi \\ \cos 2t, & \pi < t < 2\pi \\ \cos 3t, & t > 2\pi \end{cases}$ in terms unit step function & hence find LT
6. Evaluate $L[t^2 u(t - 3)]$.
7. Find the inverse transform $\frac{s+2}{s^2-4s+13}$.
8. Find $L^{-1}\left(\frac{4s+5}{(s-1)^2(x+2)}\right)$
9. Find $L^{-1}\left(\frac{s}{s^4+4a^4}\right)$
10. Find $L^{-1}\left(\frac{s}{(s^2+a^2)^2}\right)$.
11. Find $L^{-1}\left[\ log\ \frac{(s+1)}{(s-1)}\right]$
12. Find $L^{-1}\left[\frac{s}{(2s-1)(3s-1)}\right]$
13. Using the Convolution THM obtain the $L^{-1}\left[\frac{s}{(s^2+a^2)^2}\right]$.
14. Solve the differential equation $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3t}$ with $y(0) = 0 = y'(0)$, using LT
15. Solve the differential equation $y'' + 4y' + 3y = e^{-t}, y(0) = 1 = y'(0)$. Using LT

Module-4:

1. Find the real root of the equation $xlog_{10}x$ =1.2 by Regula-Falsi method correct to four decimal places.
2. Find by Newton's method, the real root of the equation 3x = cosx +1.
3. Using the Newton's Raphson method, find a root of the following equations correct to the three decimal
4. Places. i) 3sin x – 2x+5 = 0 near 3, ii) x sin x + cos x = 0 which is near x = π

5. Find by Newton's method, the root of the equation cos x = x e^x.
6. Use Newton-Raphson method to find a real root of the equation $\log x - \cos x = 0$
7. By applying Weddle's Rule evaluate $\int_0^1 \frac{x}{1+x^2} dx$ by considering 7 ordinates. Hence find the value of $log_e 2$
8. Evaluate $\int_0^1 \frac{1}{1+x} dx$, by using Simpson 1/3 rd rule, considering seven ordinates. Hence deduce the value of $log_e 2$.
9. Find the interpolating formula that approximates to the function described by the following table

x	0	1	2	5
y	2	3	12	147

10. Find 'y' when x= 0.26 using appropriate interpolation formula to the following data,

X	0.10	0.15	0.20	0.25	0.30
Y	0.1003	0.1511	0.2027	0.2553	0.3093

11. If y(5)=150 , y(7)=392 , y(11)=1492 , y(13)=2366 ,y(17) = 5202 then find y(9) by using Lagrange's Formula
12. Apply Lagrange's Inverse interpolation formula to find a root of the equation f(x)=0 given that
    $f(30) = -30,\ f(34) = -13,\ f(38) = 3,\ f(42) = 18.$
13. Use Newton's divided difference formula to find f(4) given

x	0	2	3	6
y	- 4	2	14	158

14. The following table gives the distances in nautical miles of the visible horizon for the given heights in feet above the earth's surface

x:height	100	150	200	250	300	350	400
y:distance	10.63	13.03	15.04	16.81	18.42	19.90	21.27

Find the values of y when x=218 feet and 410 feet

15. From the following table, estimate the number of students who obtained marks between 40 & 45

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

16. In the table below the value of y are conjugative terms of a series of which 23.6 are the 6^{th} term. Find
    The first & tenth terms of the series

x	3	4	5	6	7	8	9
y	4.8	8.7	14.5	23.6	36.2	52.8	73.9

17. Given the values

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Find f(15) and f(19)

18. Use Newton's divided difference formula to find f(x) given the data

x	0	2	3	6
f(x)	-4	2	14	158

19. Given the values

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Evaluate f (9) using divided difference formula for unequal intervals.

20. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's 1/3 rd rule taking four equal strips
21. If y(1) =3,y(3) = 9, (4) = 30,y(6) =132, Find Lagrange's interpolation formula & hence find y at x=5.

22. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using

i) Simpson's 1/3 rd rule , ii) Simpson's 3/8th rule, iii) Weddle's rule compare with its actual value.

23. Use Simpson's 1/3 rd rule to find $\int_0^{0.6} e^{-x^2} dx$ by taking seven ordinates.

24. Using Simpson's 3/8th rule , evaluate $\int_0^{0.3} \sqrt{1-8x^3}\, dx$ by taking 7 ordinates.

25. Integrate numerically $\int_0^{\frac{\pi}{2}} \sqrt{cos\theta}\, d\theta$

Module-5:

1. Solve $\frac{dy}{dx} = x^2y - 1$with $y(0) = 1$ using Taylor's series method and find $y(0.1)$ consider up to 4th degree terms.
2. Use Runge Kutta fourth order method to solve $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$ with $y(0) = 1$ and find y for $x =$ 0.2 and 0.4 take $h = 0.2$.
3. Given$\frac{dy}{dx} = xy + y^2$,$y(0) = 1, y(0.1) = 1.1169$, $y(0.2) = 1.2773, y(0.3) = 1.5049$ $find$ $y(0.4)$ accurate up to three decimal places using Milne's predictor corrector method.
4. Applying R-K method to find an approximate value of y for x=0.2 in steps of 0.1 of $\frac{dy}{dx} = x + y^2$ given that $y = 1$ when $x = 0$.
5. Given $\frac{dy}{dx} = x^2(1+y)$ & $y(1) = 1, y(1.1) = 1.233, y(1.2) = 1.548, y(1.3) = 1.979$. Evaluate $y(1.4)$ by Adams Bash Fourth method
6. Employ Taylor's series method to find an approximate solution correct to fourth decimal places for the following initial value problem at x=0.1 & 0.2 $\frac{dy}{dx} = 2y + 3e^x$, $y(0) = 0$.
7. Using Milne's predictor corrector method find y where $x = 0.8$ given $\frac{dy}{dx} = x - y^2$, $y(0) = 0$, $y(0.2) = 0.02, y(0.4) = 0.0795, y(0.6) = 0.1762$.Applying corrector formula twice.
8. Employ R-K method of 4rth order to solve the equation$\frac{dy}{dx} = 3x + y/2, y(0) = 1$ at $x = 0.2$ taking step length$h = 0.1$.
9. Solve the differential equation $\frac{dy}{dx} = x^2 + y^2$ given $y(0) = 1$ to find the value of $y(0.1)$ by using Taylor's series method of order.
10. Using modified Euler's method ,solve the equation $\frac{dy}{dx} = \frac{1}{x+y}$, $y(0) = 1$ in steps of 0.5 at $x = 1$
11. Using Taylor's series method to find y at the point $x = 0.1$ & $x = 0.2$ given that $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 1$
12. From the data given below find y at $x = 1.4$ using Milne's predictor corrector method $y' = \frac{x^2+y}{2}$

x	1	1.1	1.2	1.3
y	2	2.2156	2.4649	2.7514

Prepared by	Checked by		
Dr. S. L. Patil Prof. S. S. Thabaj Prof. I. N. Kambar	Dr. S. L. Patil	HOD	Principal

Course Title	Mathematics-II for Electrical & Electronics		
Course **Code**	BMATE201	**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**	**04**
Total Hours of Pedagogy	40 hours Theory + 10 to12 Lab slots	**Credits**	**04**

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 predictor-corrector \ method

Subject Title	**Chemistry for Electrical and Electronics Engineering stream**		
Subject Code	**BCHEE202**	**CIE Marks**	50
		SEE Marks	50
Number of Lecture Hrs / Week	2+2+2	**Total Marks**	100
Total Number of Lecture Hrs	40 hours Theory + 10 to12 Lab slots	**Exam Hours**	03+02
		CREDITS – 04	

FACULTY DETAILS:		
Name: 1) Dr. M. S. Hanagadakar 2) Dr. S. J. Walki 3) Dr. Tanuja S.B.	**Designation:** 1) Associate Prof. 2) Assistant Prof. 3) Assistant Prof.	**Experience:** 1) 16.5 Years 2) 7.5 Years 3) 6.5 Years
No. of times course taught: 1) 23 (including Present) 2) 15 (including Present) 3) 02 (including Present)	**Specialization:** 1) Physical Chemistry 2) Organic Chemistry 3) Physical Chemistry	

1.0 Prerequisite Subjects:

Students should have the basic knowledge chemistry and Basic Science.

Sl. No	Branch	Semester	Subject
01	EEE	II	Chemistry for Electrical and Electronics Engineering stream

2.0 Course Objectives

To provide students with knowledge of engineering chemistry for building technical competence in industries, research and development in the following fields

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

3.0 Course Outcomes

On completion of this course, students will have knowledge in:

	Course Outcome	**POs**	**RBT Levels**
CO1	Identify the terms and processes involved in scientific and engineering applications	1,2,3, & 7	L3
CO2	Explain the phenomena of chemistry to describe the methods of engineering processes	1,2,3, & 7	L1 &L2
CO3	Solve for the problems in chemistry that are pertinent in engineering applications	1,2,3, & 7	L3
CO4	Apply the basic concepts of chemistry to explain the chemical properties and processes	1,2,3, & 7	L3
CO5	Analyze properties and processes associated with chemical substances in multidisciplinary situations	1,2,3, & 7	L1&L2
Total Hours of instruction		**100**	

4.0 Course Content

MODULE 1: Chemistry of Electronic Materials

Conductors and Insulators: Introduction, principle with examples.

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

Polymers: Introduction, Molecular weight - Number average, Weight average and numerical problems. Conducting polymers – synthesis and conducting mechanism of polyacetylene. Preparation, properties and commercial applications of graphene oxide. PCB: Electroless plating – Introduction, Electroless plating of copper in the manufacture of double-sided PCB.

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

MODULE 2: Energy Conversion and Storage

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

Fuel Cells: Introduction, construction, working and applications of methanol–oxygen and polymer electrolyte membrane (PEM) fuel cell.

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

Self-learning: Electrodes for electrostatic double layer capacitors, pseudo capacitors, and hybrid capacitor.

MODULE 3: Corrosion Science and E-waste Management

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

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

Self-learning: Recycling of PCB and battery components

MODULE 4: Nanomaterials and Display Systems

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

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

Perovskite Materials: Introduction, properties and applications in optoelectronic devices

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

MODULE 5: Sensors in Analytical Techniques

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

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

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

Self-learning: IR and UV- Visible spectroscopy.

PRACTICAL MODULE

A– Demonstration (any two) offline/virtual:

A1. Synthesis of polyurethane
A2. Determination of strength of an acid in Pb-acid battery
A3. Synthesis of iron oxide nanoparticles
A4. Electroplating of copper on metallic objects

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

B1.Conductometric estimation of acid mixture
B2. Potentiometric estimation of FAS using K2Cr2O7
B3. Determination of pKa of vinegar using pH sensor (Glass electrode)
B4. Determination of rate of corrosion of mild steel by weight loss method
B5.Estimation of total hardness of water by EDTA method

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

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

D – Open Ended Experiments (any two):

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

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	II	Nano technology, Water chemistry, Civil. ECE/EEE,/ME,Corrosion study, (Common to all Engineering subjects)	Introduction to fundamental aspects of chemistry and Engineering chemistry in I/II semester Students will learn the laboratory and practical techniques needed for the later years of the course. Students have to choose and elective paper on applied chemistry as well.

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Generate electricity in the most efficient fashion to preserve our natural resources and protect the environment.
02	Improve mining techniques, so they minimize environmental damage and cost less.
03	Manufacture petrochemicals, making them cheaper and safe for people to use Create renewable fuels and energy sources to replace coal, petrol and gas. Refine oil into petrol, keeping petrol prices low and improving petrol quality so it doesn't pollute the air.
04	Produce safe drinking water from rivers, groundwater or the sea for city, rural and remote aboriginal communities.
05	Safely treat toxic hazardous industrial wastes so their disposal does not harm the environment
06	Nanotechnology (an emerging scientific area utilizing very small particles for diverse applications)
07	Semi-conductors & microelectronics (many chemical engineers work in these areas)

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Numerical problems discussion
02	NPTEL	Each module/ Chapter presentation

8.0 Books Used and Recommended to Students

Text Books

1. B. S. Jai Prakash, R. Venigopal, Shivakumarraiah, PushpaIyengar, Chemistry for Engineering Students, Subhas Stores (Bangalore), 2014
2. R. V. Gadag and A. N. Shetty, Engineering Chemistry, IK International Publishing House, New Delhi, Third Edition 2014
3. P.C. Jain & Monica Jain. **"Engineering Chemistry"**, DhanpatRai Publications, New Delhi (2015 Edition).
4. S. S. Dara, A textbook of Engineering Chemistry, 10th Edition, S Chand & Co., Ltd., New Delhi, 2014.
5. Physical Chemistry, by P. W. Atkins, Oxford Publications (Eighth edition-2006).

Reference Books

1. O.G.Palanna,"Engineering Chemistry",Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint.
2. G.A.Ozin& A.C. Arsenault, "NanochemistryA Chemical Approach to Nanomaterials", RSC publishing, 2005.
3. V. R. Gawariker, N V. Viswanathan, JayadevSreedhar, Polymer Science, New Age International (P) Ltd., New Delhi, 2nd edition 2015.
4. M.G.Fontana., "Corrosion Engineering", Tata McGraw Hill Publishing Pvt. Ltd. New Delhi.
5. Engineering Chemistry by S.S Dara, S.S Umare., S. Chand & Co. Pvt Ltd. New Delhi.
6. Engineering Chemistry by P.R.Vijayasarathy, Second Edition, PHI Learning Pvt. Ltd. New Delhi.
7. Puri B R Sharma L R and Madan S Pathania, Principles of Physical Chemistry, Vishal publishing Co., Edition 2004
8. ArunBahl, B. S. Bahl, A Text Book of Organic Chemistry, S Chand and Co. Ltd., First Edition 2005
9. Michael F. Ashby, Paulo J. Ferreira, Daniel L. Schodek, Nano Materials, Nanotechnologies and Design, Elsevier India Pvt. Ltd., 2011.
10. T Pradeep, NANO: The Essentials, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012, 7th Reprint
11. Fred W. Billmeyer, Text Book of Polymer Science, Wiley India (P) Ltd., Third Edition 2011

Additional Study material & e-Books

1. Introduction to Chemistry - Tracy Poulsen; 250 pages; ISBN-13: 9781478298601; ISBN-10: 147829860X
2. Elementary Applied Chemistry * - Lewis BenajahAllyn; 152 pages; Publisher: Ginn and Company 1912; ISBN/ASIN: 1112247610.
3. Kuriocose, J C and Rajaram, J, Engineering Chemistry, Volume I/II, Tata McGraw- Hill Publishing Co. Ltd.New Delhi, 2000

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

1.http://www.mooc-list.com/course/chemistry-minor-saylororg
2. https://www.canvas.net/courses/exploring-chemistry
3. http://nptel.ac.in/courses/122101001/
4.http://www.nptelvideos.in/2012/11/engineering-chemistry-1.html

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	International Journal of Engineering Science	https://www.journals.elsevier.com/international-journal-of-engineering-science
2	International Journal of Engineering Trends and Technology	http://ijettjournal.org/
3	Nanotechnology, Science and Applications	https://www.dovepress.com/nanotechnology-science-and-applications-journal

11.0 Examination Note

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 20 Marks (duration 01 hour)

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

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

Two assignments each of 10 Marks

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

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

CIE for the practical component of the Integrated Course

1. 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. common/repeated for any of the methods of the CIE. Each method of CIE should have a different
2. 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**.
3. The laboratory test **(duration 02/03 hours)** at the end of the 14th /15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and **scaled down to 05 marks.**
4. Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **20 marks**.

Semester End Examination (SEE): 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).

SCHEME OF EXTERNAL EXAMINATION:

Ten main questions to be set in question paper. Each main question will carry 16 marks. Student has to answer either 1 or 2 main question. It will continue up to 10th question.

Module I– Question 1(a,b,c) or 2(a,b,c) = 20Marks
Module II – Question 3(a,b,c) or 4(a,b,c) = 20Marks
Module III– Question 5(a,b,c) or 6(a,b,c) = 20Marks
Module IV – Question 7(a,b,c) or 8(a,b,c) = 20Marks
ModuleV – Question 9(a,b,c) or 10(a,b,c) = 20Marks
Total = 100Marks

INSTRUCTION FOR ENGINEERING CHEMISTRY (22CHEE12/22) EXAMINATION

1. The total exam duration is 3 hours.
2. Use black ink pen for writing examination
3. Drawing should be drawn from dark pencil.
4. Read the questions carefully.
5. Answer the questions up to the point.

Passing standard:

1. 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.
2. 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.

12.0 Course Delivery Plan

Module No.	Lecture No.	Content of Lecture	% of Portion
1	1	Conductors and Insulators: Definition of conductors, semiconductor and insulators based on band theory, principle with examples taking Cu, Si **and Quartz or any suitable example.**	20.0
	2	Semiconductors: Introduction, production of electronic grade silicon from quartz	
	3	i) Czochralski process (CZ) and ii) Float Zone (FZ) methods	
	4	Polymers: Importance and developments in the field of olymers, Definition of number and weight average molecular mass, Formulae there in.	
	5	Numerical problems on Number average and Weight average molecular mass	
	6	PCB: Electroless plating – Introduction, Electroless plating of Copper in	

		the manufacture of double-sided PCB.	
	7	Conducting polymers – synthesis of polyacetylene, Conducting mechanism of polyacetylene (explanation interms of either p or n-doping) steps involved include polaron, bipolaron and soliton pair simpleaddition technique, zeigler Nutta catalyst).	
	8	Graphene Oxide: Preparation(hummers method), properties and commercial applications (any 4 each).	
2	1	Batteries: Introduction, classification of batteries as primary, secondary **and reserve batteries with examples**	**20.0**
	2,3,4	Components, construction, working and applications of modern batteries; **Na-ion battery i)solid state battery (Li-polymer battery) and iii) flow battery (Vanadium redox flow battery)**	
	6	Fuel Cells: Introduction, construction, working and applications of **methanol–oxygen**	
	7	**polymer electrolyte membrane (PEM) fuel cell**	
	8	Solar Energy: Introduction, importance of solar PV cell, Construction and working of solar PV cell, advantages and disadvantages.	
3	1	**Corrosion Chemistry:** Introduction (ill effects, global losses, technological importance), electrochemical theory of corrosion (principle, reactions under different conditions anddiagram taking iron as an example)	**20.0**
	2	Types of corrosion- differential metal ((Definition, Principle, Process and application)	
	3	Differential aeration (principle, explanation with examples), Corrosion control – ((Definition, Principle, Process and application)galvanization,	
	4	Anodization and sacrificial anode method	
	5	Corrosion Penetration Rate (CPR) (Definition and formula) - Introduction and numerical problems (at least 4)	
	6	E-waste Management: Introduction (ill effects of e-waste management, global losses, environmental importance), sources, types, effects of e-waste on environment and human health	
	7	Methods of disposal(Classification) , advantages of recycling	
	8	Extraction of copper and gold from e-waste(Principle, process, taking PCB as an example)	
4	1	Nanomaterials: Introduction, size dependent properties of nanomaterials(Surface area, Catalytic, Conducting)	**20.0**
	2	Preparation of nanomaterials by sol-gel and co-precipitation method with example.	
	3	Introduction, properties and applications - Nanofibers, Nanophotonics, Nanosensors.	
	4	Display Systems: Liquid crystals (LC's) - Introduction, classification, properties	

	5	Application in Liquid Crystal Displays (LCD's).	
	6	Properties and application of Organic Light Emitting Diodes (OLED's)	
	7	Properties and application of Quantum Light emitting diodes (QLED's).	
	8	Perovskite Materials: Introduction, properties and applications in **optoelectronic devices (solar cells).**	
5	1	Electrode System: Introduction, types of electrodes	**20.0**
	2	Ion selective electrode – definition, construction, working and applications of glass electrode. Determination of pH using glass electrode	
	3	Reference electrode - Introduction, calomel electrode – construction, working and applications of calomel lectrode	
	4	Concentration cell – Definition, construction and Numerical problems	
	5	Sensors: Introduction, general working principle (schematic diagram and explanation) and applications of conductometric sensors	
	6	Introduction, brief working principle and applications electrochemical sensors, Thermometric sensors, and Optical sensors.(No instrumentation)	
	7	Analytical Techniques: Introduction, principle and instrumentation of Colorimetric sensors; application in estimation of the Copper	
	8	Potentiometric sensors; (definition and Principle Instrumentation and working application in estimation of Iron) conductometric sensors; (definition and Principle Instrumentation andworking application its application in the estimation of weak acid.	

13.0 QUESTION BANK

Module-I Chemistry of Electronic Materials

1) What are conductors and insulators? Explain the principle involved in conductors and insulators by taking an examples.
2) Mention the differences between conductors, semiconductors and insulators.
3) What are semiconductors? Explain the production of electronic grade silicon by Czochralski (CZ) process.
4) Explain the production of electronic grade silicon by Float Zone (FZ) method.
5) What are conducting polymers? Explain the synthesis and conducting mechanism of polyacetylene. Mention its commerci applications.
6) Explain the preparation, properties and commercial applications of graphene oxide.
7) Define electroless plating. Describe the electroless plating of copper in the manufacture of double-sided PCB.

MODULE 2: Energy Conversion and Storage

1) Define batteries. Explain the construction, working and applications of Na-ion battery.
2) Explain the components in the battery.
3) Describe construction, working and applications of Li-polymer solid state battery.
4) Explain construction, working and applications of Vanadium redox flow battery.
5) Define fuel cells. Explain the construction, working and applications of Methanol-oxygen fuel cell.
6) Explain the construction, working and applications of polymer electrolyte membrane (PEM) fuel cell.
7) What are photovoltaic cells? Explain the construction and working of solar photovoltaic cell. Mention their advantages and disadvantages.

MODULE 3: Corrosion Science and E-waste Management

1) Define Metallic corrosion. Explain the electrochemical theory of corrosion.

2) Define differential metal corrosion and differential aeration corrosion.
3) Explain the corrosion taking place when two different metals are in contact with each other.
4) Explain the water line and pitting corrosion.
5) Define the galvanization. Explain the steps involved galvanizing.
6) Define anodization. Explain anodizing of Aluminium.
7) Define corrosion penetration rate (CPR).
8) Define E-waste. Explain the sources and types of e-waste.
9) Describe the effects of e-waste on environment and human health.
10) Explain the methods of disposal of e-waste.
11) Write a note on the advantages of recycling.
12) Explain the extraction of copper and gold from e-waste.

MODULE 4: Nanomaterials and Display Systems

1) What are nanomaterials ? Explain the size dependent properties of nanomaterials.
2) Explain the preparation of nanomaterials by sol-gel method with example.
3) Explain the preparation of nanomaterials by co-precipitation method with example.
4) Write a note on properties and applications of nanofibres.
5) Explain the properties and applications of nanophotonics and nanosensors.
6) What are liquid crystals? Explain the classification of liquid crystals.
7) Describe the properties of Liquid crystals and application in LCD's.
8) Explain the properties and applications of organic light emitting diodes (OLED's).
9) Explain the properties and applications of Quantum light emitting diodes (QLED's).
10) What are perovskite materials? Explain the properties and applications in optoelectronic devices.

MODULE 5: Sensors in Analytical Techniques

1) Explain the types of electrodes.
2) Define Ion selective electrode. Explain the construction, working and applications of glass electrode.
3) Explain the determination of pH using glass electrode.
4) Define reference electrode. Explain the construction, working and applications of calomel electrode.
5) Define concentration cells. Explain construction of concentration cells.
6) Numerical problems on Concentration cell.
7) Explain the working principle and applications of Conductometric sensors.
8) Explain the working principle and applications of electrochemical sensors.
9) Describe the working principle and applications of Thermometric sensors.
10) Describe the working principle and applications of optical sensors.
11) Explain the principle and instrumentation of colorimetric sensors and applications in the estimation of copper.
12) Explain the principle and instrumentation of potentiometric sensors and its applications in the estimation of iron.
13) Explain the principle and instrumentation of conductometric sensors and its applications in the estimation of weak acid.

14.0 University Result

Examination	S	A	B	C	D	E	% Passing

Prepared by	Checked by		
Prepared by 1) **Dr. M. S. Hanagadakar** 2) **Dr. S. J. Walki** 3) **Dr. Tanuja S.B.**	**HOD**(Chemistry) **(Dr. M. S. Hanagadakar)**	**HOD**	**Principal**

Subject Title	**Computer Aided Engineering Drawing**		
Course Code	**22CAED203**	**CIE Marks**	50
Number of Lecture Hrs / Week	2:0:2:0	**SEE Marks**	50
Total Number of Lecture Hrs	40	**Exam Hours**	03
Credits	03		

FACULTY DETAILS:		
Name: **Prof. D.N. INAMDAR**	**Designation:** Asst .Professor	**Experience:**21Years
No. of times course taught:15	**Specialization:** Tool Design	

FACULTY DETAILS:		
Name: Prof. GIRISH M. ZULAPI	**Designation:** Asst .Professor	**Experience:** 15 Years
No. of times course taught: 04	**Specialization:** Product Design and Manufacturing	

FACULTY DETAILS:		
Name: **Prof. P.M. KOKITAKAR**	**Designation:** Asst .Professor	**Experience:**05Years
No. of times course taught:00	**Specialization:** Machine Design	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	High School	8, 9,10th Std.	Geometry
02	PU Science	I and II year	Trigonometry, Mathematical Curves and Analytical Geometry.

2.0 Course 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 visualise engineering components

3.0 Course Outcomes

Having successfully completed this course, the student will be able to draw and use modeling software's to generate

	Course Outcome	Cognitive Level	Pos
CO1	Draw and communicate the objects with definite shape and dimensions	U	PO1, PO5,
CO2	Recognize and Draw the shape and size of objects through different views	U	PO1, PO5,
CO3	Develop the lateral surfaces of the object	U	PO1, PO5,
CO4	Create a 3D views using CAD software.	U	PO1, PO5,

CO5	Identify the interdisciplinary engineering components or systems through its graphical representation.	U	PO1, PO5,
Total Hours of instruction		**40**	

4.0 Course Content

MODULE-1

Introduction: ***for CIE only***

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales.

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

Orthographic Projections of Points, Lines and Planes:

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

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

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

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

MODULE-2

Orthographic Projection of Solids:

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

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

MODULE – 3

Isometric Projections:

Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones andspheres. 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 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 andrectangular 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 todimensions etc

Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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.

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	III	Computer aided Machine Drawing	Modeling and Assembly drawing of Machine Parts
02	V/VI	Design of Machine Elements I/II	Fasteners, Keys and Joints, Rivets and Assembly drawings.
03	VIII	Project work	Part Modeling and its detailed drawings,

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Industrial drawings and design of various components in all engineering disciplines including Mechincal Engg.
02	Model creation for Stress and thermal analysis of parts modeled
03	May be contribute as Developer of a software applications in industrial mechanical engineering needs.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Lettering, Line, Methods of dimensioning, Animated videos, online discussion on the topics as and when required to students.
02	NPTEL	Videos of machine Assembly drawings and drawing standards

8.0 Books Used and Recommended to Students

Text Books

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

Reference Books

- *Bhattacharya S. K.*, Electrical Engineering Drawing, New Age International publishers, second edition 1998, 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*, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.
- *K. R. Gopalakrishna, & Sudhir Gopalakrishna*: Textbook Of Computer Aided Engineering Drawing, 39thEdition, Subash Stores, Bangalore,2017

Additional Study material & e-Books

COMPUTER AIDED ENGINEERING DRAWING BY N.H.Ramaiah and Rajshekar. NEW AGE International publication 2008-09

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
1) https://hareeshang.wordpress.com/tutorials/caed/
2) http://m.noteboy.in/vtuflies/machine%20drawing.pdf
3) https://www.edx.org/school/iitbombayx?utm_source=bing&utm_medium=cpc&utm_term=iit-bombay&utm_campaign=partner-iit-bombay
4) http://www.vlab.co.in/

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	Journal of Aircraft	http://arc.aiaa.org/loi/ja
2	International Journal of Solids and Structures	http://www.sciencedirect.com/science/journal/00207683
3	Journal of Manufacturing Science and Engineering	http://manufacturingscience.asmedigitalcollection.asme.org/issue.aspx?journalid=125&issueid=27340
4	American Fastener Journal	http://www.fastenerjournal.com/

11.0 Examination Note

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 mark 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 total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation (CIE)

- CIE shall be evaluated for max marks 100. Marks obtained shall be accounted for CIE final marks, reducing itby 50%.
- CIE component should comprise of Continuous evaluation of Drawing work of students as and when the Modules are covered on the basis of belowdetailed weightage.

Module	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Preparatory 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
Total	**100**	**80**	**20**
Consideration of Class work		**Total of [(a) + (b)] = 100 Scale down to 30 marks**	

- 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 **20Mark**s.
- 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 by50%
- 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 theexaminers.
- Scheme of Evaluation: *To be defined by the examiners jointly and the same shall be submitted to the university along with questionpaper.*

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 withoutsketch.*

Module	**Max. MarksWeightage**	**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
Total	**100**	**80**	**20**
Consideration of SEE Marks	**Total of (a) + (b) ÷ 2 = Final SEE marks**		

12.0 Course Delivery Plan

Module No.	Lecture No.	Content of Lecture	Teaching Method	Laboratory Component	%of Portion
I	1	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	**Chalk & Talk**	**Power Point Presentation & Demo using solid edge drafting software of one illustrative example**	**20**
	2	**Orthographic Projections of Points, Lines and Planes:** **Orthographic Projections of Points:** Introduction to Orthographic projections Orthographic projections of points in 1st and 3rd quadrants.			
	3	**Problems on projection of points.**			
	4	**Orthographic Projections of Lines :** Problems on Orthographic projections of lines. (Placed in First quadrant only).			
	5	Problems on Orthographic projections of lines. (Placed in First quadrant only).			
	6	**Orthographic Projections of Planes:** Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon and circular laminae. (Placed in First quadrant only using change of position method).			
	7	Orthographic projections of planes viz rectangle, pentagon			
	8	Orthographic projections of planes viz hexagon and circular laminae.			
II	9	**Orthographic Projections of solids:**	**Chalk**	**Lab session**	

		Introduction, definitions Orthographic projection of right regular solids **(Solids Resting on HP only):** Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes, &Tetrahedron.	**& Talk**	**on sketching and computer aided drafting on projection of solids.**	
	10	Position of solids with reference to planes of projections considering its base, face, axis, base edge, face edge, base corner etc.			
	11	Tips to draw projection of solids with an example with change of position of method			
	12	Projection of triangular, square and rectangular pyramids-variety of problems will be solved			**20**
	13	Projection of pentagonal, hexagonal pyramids – variety of problems will be solved.			
	14	Lab session on sketching and computer aided drafting on projection of solids on triangular, square, pentagonal and hexagonal pyramids			
	15	Problems on Projection of cones and cylinders			
	16	Problems on projection of prisms – square, pentagonal, hexagonal prisms			
	17	Projections of Frustum of cone, pyramid & truncated sphere (For CIE only).			
	18	Solution of problems from VTU question papers			
III	19	**Isometric Projections :** Introduction, Isometric scale, Isometric projection of simple plane figures,	**Chalk & Talk**	**PowerPoint Presentation & Demo using solid edge drafting software of one illustrative example**	**20**
	20	Isometric projection of hexahedron(cube), right regular prisms,			
	21	Isometric projection of pyramids, cylinders			
	22	Isometric projection of cones, spheres			
	23	Isometric projection of combination of two simple solids			
	24	Conversion of given Isometric/ pictorial views to orthographic views of simple objects.			
	25	**Introduction to Conversion of simple isometric drawings into orthographic views.** Illustrative example on it.			
	26	Two simple Problems on applications of Isometric projections of simple objects / engineering components.			
IV	27	**Development of Lateral Surfaces of Solids:** Introduction to section planes and sectional views.	**Chalk & Talk**	**PowerPoint Presentation & Demo using solid edge drafting software of one illustrative**	**20**
	28	Development of lateral surfaces of right regular prisms,			
	29	Development of lateral surfaces of right cylinders, pyramids,			
	30	Development of lateral surfaces of cones resting with base on HP only.			
	31	Development of their frustums and truncations.			

	32	Problems on applications of development of lateral surfaces like, funnels and trays.		**example**	
	33	Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct.			
V	33	Multidisciplinary Applications & Practice (For CIE Only): Free hand Sketching; True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc		**PowerPoint Presentation & Demo using You tube tutorials/Relevant modeling drafting softwares**	**20**
	34	Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains,			
	35	Ratchets, two wheeler cart & Four wheeler carts to dimensions etc			
	36	Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic power distribution system uses suitable software			
	37	Electronics Engineering Drawings- Like, Simple Electronics Circuit Drawings.			
	38	Basic Building Drawing; Like, Architectural floor plan, basic foundation drawing,			
	39	steel structures- Frames, bridges, trusses using Auto CAD or suitable software			
	40	Graphs & Charts: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.			

13.0 Assignments, Pop Quiz, Mini Project, Seminars

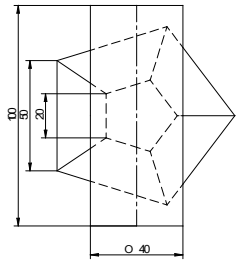
Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: University Questions on Projection of Points	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	2	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
2	Assignment 2: University Questions on Projection of lines	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	4	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
3	Assignment 3: University Questions on PROJECTION OF PLANES .	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	6	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference

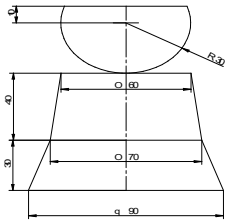
						list
4	Assignment 4: University Questions on PROJECTION OF SOLIDS	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 2 of the syllabus	10	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
5	Assignment 5: University Questions on Isometric Projections	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 3 of the syllabus	14	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
6	Assignment 6: University Questions on PROJECTIONS ON Developments	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 4 of the syllabus	12	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
7	Assignment 7: Multidisciplinary Applications & Practice :	Students understand application of engineering drawing in all engineering streams with one illustrative example.	Module 5 of the syllabus	15	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, and tutorial websites of the reference list.

14.0 Assignment Questions

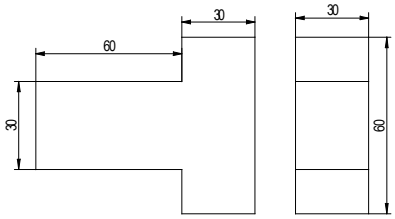
Assignment No	Questions	Marks
I	1. Draw the projection of the following points on the same XY line, keeping convenient distance between each projector. Name the Quadrants in which they lie. a. A - 30 mm above HP & 35 mm in front of VP. b. B - 35 mm above HP & 40 mm behind VP. c. C - 40 mm above HP & on VP. d. D - 35 mm below HP & 30mm in front of VP. 2. A point G is 25mm below HP & situated in the third quadrant its shortest distance from XY line is 45 mm. Draw its projections and find its distance from VP. 3. A point S is in the first quadrant and equidistance of 50 mm from all the three principle planes Draw the projection of the point. Draw all the three views of the point. 4. A point P is 30mm in front of VP, 40mm above HP and 50mm from RPP. Draw its projections. 5. A point is 35mm below HP, 20mm behind VP and 25mm behind/in front/ from RPP. Draw its projections and name the side view. 6. A point is 35mm below HP, 15mm behind VP & 25mm behind/in front/from RPP. Draw the projection and name the side view.	15 15 15 15 15 15 15
II	1. A line AB has its end A 20 mm above the HP and 30 mm in front of the VP. The other end B is 60 mm above the HP and 45mm in front of VP. The distance	

	between end projectors is 70 mm. Draw its projections. Determine the true length and apparent inclinations.	15
	2. The top view pq of a straight line is 70 mm and makes an angle of 60 with XY line. The end Q is 10 mm infront of VP and 30 mm above the HP. The difference between the distances of P and Q above the HP is 45 mm. Draw the projections. Determine its true length and true inclinations with HP and VP.	15
	3. A line has its end A 10 mm above Hp and 15 mm infront of VP. The end B is 55 mm above HP and line is inclined at 30 to HP and 35 to VP. The distance between the end projectors is 50 mm. Draw the projections of the line. Determine the true length of the line and its inclinations with VP.	15
	4. A straight line PQ inclined at 40° to VP has pq = 60mmand p'q'=50mm. The end P is both in HP and VP, and 40 mm to the right of left profile plane. a) Draw the projections of the straight line PQ b) Draw the true length and true inclination with HP. c) Draw the profile view of the straight line. d) Find the position of the end Q with HP and VP.	15
	5. Draw the projections of line PQ and find the true length and inclinations when the line is inclined at 30° to the HP and 45° to the VP. The line is having one of its end 15mm above HP and 20mm in front of VP. The distance between the end projectors on the XY line is 60mm.	15
	6. A straight line PQ 80mm long appears to a length of 50mm and inclined at 30° to xy line in its side view. Draw its projection when its end point P is 15mm above HP and 60mm in front of VP. Point Q is nearer to VP than P.	15
	7. Draw the projections of a line PQ and find its apparent lengths, true length and true inclination with HP when the line PQ has its end P 25mm above HP and 20mm in front of VP. The distance between the end projectors of the line when measured parallel to the line of intersection of the HP & VP is 60mm. The end Q is 50mm above the HP and the line is inclined at 30° to the VP.	15
III	1. An equilateral triangular lamina of 25mm side lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 60°. The edge on which it rests is inclined to VP at 60°. Draw the projections.	20
	2. An equilateral triangular lamina of 25mm side lies on one of its sides on HP. The lamina makes 45° with HP and one of its medians is inclined at 40° to VP. Draw its projections.	20
	3. A triangular lamina o f25mm sides rests on one of its corners on VP such that median passing through the corner on which it rests is inclined to HP at 30° and draw its projections.	20
	4. A triangular plane figure of sides 25mm is resting onHP with one of its corners, such that the surface of the lamina makes an angle of 60° with HP. If the side opposite to the corner on which the lamina rests makes an angle of 30° with VP, draw the top and front views in this position.	20
	5 A triangular plane lamina of sides 25mm is resting on HP with one of its corners touching it, such that the side opposite to the corner on which it rests is 15mm above HP and makes an angle of 30° with VP. Draw the top and front views in this position. Also determine the inclination of the lamina to the reference plane.	20
	6. A pentagonal lamina having edges 25mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30 to HP and 45 VP. Draw the top and front views of the lamina.	20
	7. A hexagonal lamina of 30mm sides rests on HP with one of its corners touching VP and surface inclined at 45 to it. One of its edges is inclined to HP at 30 . Draw the	

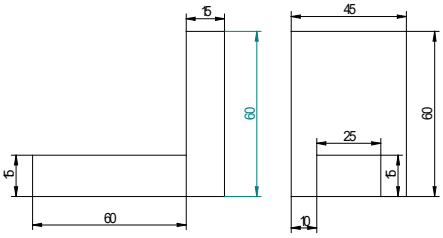
	front and top views of the lamina in its final position.	
IV	1. A square prism 35mm sides of base and 60mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 and to VP at 30 . 2. A pentagonal prism 25mm sides of the base and 60mm axis length rests on HP on one of its edges of the base. Draw the projections of the prisms when the axis is inclined to HP at 40 and VP at 30 3. A hexagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests makes equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 and appears to be inclined to VP at 45 . 4. A hexagonal prism 25mm sides of base and 50mm axis length is suspended freely from a corner of its base. Draw the projections of the prism when the axis appears to be inclined to VP at 45 . 5. A square pyramid 35mm sides of base and 60mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45 and VP at 30 . 6. A hexahedron of 30mm sides is resting on one of its corners on HP such that one of its solid diagonals is perpendicular to VP. Draw the projections of the solid. 7. A cone of base Φ 40mm axis length 50mm is resting on HP on a point on the circumference of its base such that its apex is at 40mm above the HP and its top view of the axis is inclined at 60 to VP. Draw the top and front views of the solid. Also, determine the inclinations of the axis when the base is nearer to the observer.	20 20 20 20 20 20
V	1. Isometric projection of hexahedron (cube), right regular prisms, pyramids with illustrative examples. 1. Isometric projection of cylinders, cones, spheres, cut spheres with illustrative examples. 2. Isometric projection of combination of solids – two solids and three solids with illustrative examples from VTU question bank . 3. Lab session on sketching and computer aided drafting of above combination of solids. 4. The following fig shows the top view of the cylinder which is centrally mounted on a frustumof pentagonal pyramid of 60 mm height. Draw the isometric projection of the combination of solids  5. Following fig shows the front view of the combination of solids consisting a cut sphere and frustums of a cone and a square pyramid. Draw the isometric projections of the combination of solids.	



8 . Following fig shown the front and side views of the solid. Draw the isometric projection of the solid.



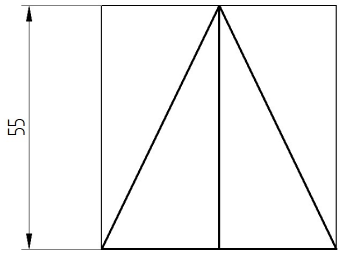
9 .Following fig shows the front and side views of the solid. Draw the isometric projection of the solid



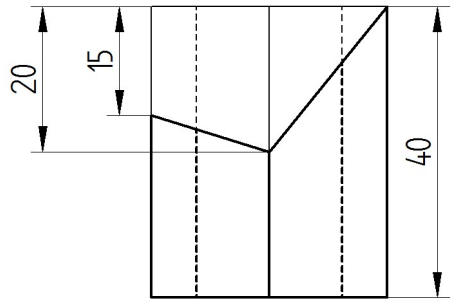
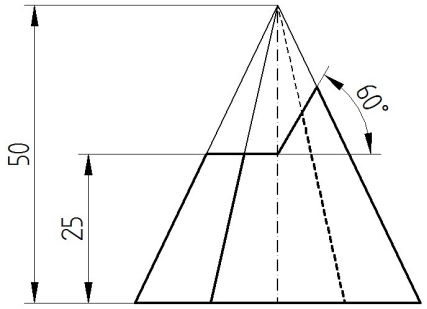
VI

1.A square prism of base side 40mm and axis length 65mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 600 to HP and perpendicular to VP and is passing through a point on the axis at distance 15mm form the top face. Draw the development of the lower portion of the prism. — 20

2.A Square prism of base side 35mm & height 55mm rests with its base on HP and two faces equally inclined to VP. Draw the development of lateral surfaces of the retained portions of the cut prism shown by dark lines in the figure. — 20



3. A pentagonal prism of base sides 30mm and axis length 60mm rests with its base — 20

	on HP and an edge of the base inclined at 45° to VP. It is cut by plane perpendicular to VP, inclined at 40° to HP and passing through a point on axis, at distance of 30mm from the base. Develop the remaining surfaces of the truncated prism. 4. A pentagonal prism of base sides 20 mm and height 40 mm is resting with its base on HP with a base edge parallel to VP. The prism is cut as shown in the following front view. Draw the development of lateral surface of prism.  5. A rectangular pyramid, side of base 25 mm × 40 mm and height 50mm has one of the sides of the base inclined at 30° to VP. Draw the development of the lateral surface of the cut pyramid, whose front view shown below. 	20 20
VII	**Multidisciplinary Applications & Practice *:*** **Free hand Sketching;** True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc **Drawing Simple Mechanisms;** Bicycles, Tricycles, Gear trains, **Electric Wiring and lighting diagrams;** Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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. **Graphs & Charts**: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.	25 25 25 25

15.0 QUESTION BANK

Module-I

Projection of Points

1. Draw the projection of the following points on the same XY line, keeping convenient distance between each projector. Name the Quadrants in which they lie.

a. A - 30 mm above HP & 35 mm in front of VP.
b. B - 35 mm above HP & 40 mm behind VP.
c. C - 40 mm above HP & on VP.
d. D - 35 mm below HP & 30mm in front of VP.

2. A point G is 25mm below HP & situated in the third quadrant its shortest distance from XY line is 45 mm. Draw its projections and find its distance from VP.
3. A point S is in the first quadrant and equidistance of 50 mm from all the three principle planes Draw the projection of the point. Draw all the three views of the point.
4. A point P is 30mm in front of VP, 40mm above HP and 50mm from RPP. Draw its projections.
5. A point is 35mm below HP, 20mm behind VP and 25mm behind/in front/ from RPP. Draw its projections and name the side view.
6. A point is 35mm below HP, 15mm behind VP & 25mm behind/in front/from RPP. Draw the projection and name the side view.

Projection of Straight Lines

1. The line AB 100 mm line measures 80 mm in the front view and 70 mm in the top view. The midpoint M of the line is 40 mm from both HP and VP. Draw its projections and find its inclinations.
2. Draw the projection of the line PQ and find its true length and inclination, when the line is inclined at 30 deg to the HP and 45 deg to VP. The line is having one of its end 15 mm above HP and 20 mm in front of VP. The distance between the end projectors on the X-Y line is 60 mm.
3. Two lines AB and AC make an angle of 120 deg between them in their front view and top view of a triangular lamina ABC. AB is parallel to both HP and VP. Determine the real angle between the sides of the triangle AB and AC.
4. A straight road going uphill from point A, due east to another point B, is 4 km long and has a slope of 15 deg. Another straight road from B due 30 deg east of north to a point C is also 4 km long but is on ground level. Determine the length and the slope of a straight road joining the points A and C. Scale; 10 mm = 0.4 km.
5. An object O is placed 1.2 m above the ground and the center of room 4.2 m x 3.6 m x 3.6 m high. Determine graphically its distance from one of the corners between the roof and the two adjacent walls. Scale; 10 mm = 0.5 m

Projection of Plane Surfaces

1. An isosceles triangular plate of negligible thickness has a base 25 mm long and altitude 35 mm. It is so placed on HP such that in the front view it is seen as an equilateral triangle of 25 mm sides that is parallel to VP is inclined at 45 deg to HP. Draw its top and front views. Also determine the inclination of the plate with the reference plane.
2. A square plate of 30 mm sides rests on HP such that one of its diagonals is inclined at 30 deg to HP and 45 deg to VP. Draw its projections.
3. A mirror 30 mm x 40 mm is inclined to the wall such that its front view is a square of 30 mm side. The longer side of the mirror appears perpendicular to both HP and VP. Find the inclinations of the mirror with the wall.
4. A pentagonal lamina having edge 25 mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30 deg to HP and 45 deg to VP. Draw the top and front views of the lamina.
5. A pentagonal lamina of sides 25 mm is having a side both on HP and VP. The surface of the lamina is inclined at an angle of 60 deg to HP. Draw the top and front view of the lamina.
6. A pentagonal lamina having edges 25 mm is placed on one of its corners on VP such that the surface makes an angle of 30 deg with VP and perpendicular bisector of the edge passing through the corner on which it rests makes an inclination to HP at 45 deg. Draw the top and front views of the lamina.

7. A hexagonal lamina of 30 mm sides rests on HP with one of its corners touching VP and surface inclined at 45 deg to it. One of its edges is inclined to HP at 30 deg. Draw the front and top views of the lamina in its final position.
8. A regular hexagonal lamina of sides 25 mm is lying in such a way that one of its sides on HP, while the side opposite to the side on which it rests is on VP. If the lamina makes 60 deg to HP, draw its projections.
9. A hexagonal lamina of sides 25 mm rests on one of its sides on VP. The lamina makes 45 deg to VP and the side on which it rests makes an angle of 45 deg to HP. Draw its projections.
10. A hexagonal lamina of sides 25 mm rests on one of its corners on HP. The lamina makes 45 deg to HP and the diagonal passing through the corner on which it rests appears to be inclined at 30 deg to VP. Draw its projections.
11. A circular lamina of 50 mm diameter rests on HP such that one of its diameters is inclined at 30 deg to VP and 45 deg to HP. Draw its projections.
12. A circular lamina inclined to VP appears in the front view as an ellipse of major axis 30 mm and minor axis 15 mm. The major axis is parallel to both HP and VP. One end of the minor axis is in both HP and VP. Draw its projections and determine the inclinations of the lamina with the VP.
13. An equilateral triangular lamina of 25 mm sides lies on one of its sides on HP. The lamina makes 45 deg with HP and one of its medians is inclined at 45 deg to VP. Draw its projections.

Module – II

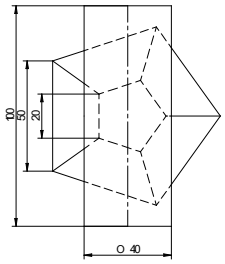
Projections of solids

1. A square prism 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
2. A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that two base edges containing the corner on which it rests makes equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
3. A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 40 deg and VP at 30 deg.
4. A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
5. A pentagonal prism 25 mm sides of base and 50 mm axis length is suspended freely from the corner of the base. Draw the projections of the prism when the axis is appears to be inclined to VP at 45 deg.
6. A square pyramid 35 sides of base and 65 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 deg. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg.
7. A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40 deg and to VP at 30 deg.
8. A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg and VP at 30 deg.
9. A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 deg. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg.
10. A pentagonal pyramid 25 mm sides of base and 50 mm axis length is suspended freely from the corner of its base. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45 deg.

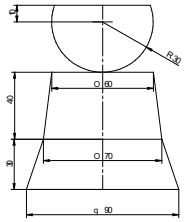
Module - III

Isometric Projections

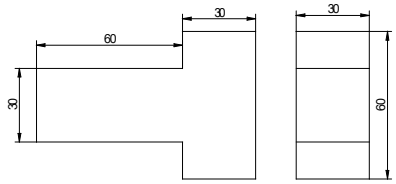
1. A hemisphere of 40 mm diameter is supported co-axially on the vertex of a cone of base diameter 60 mm and axis length 50 mm. The flat circular face of the hemi-sphere is facing upside. Draw the isometric projection of the combination of solids.
2. Draw the isometric projection of rectangular prism of 60 x 80 x 20 mm thick Para mounting a tetrahedron of side 45 mm such that the axis of the solids is collinear and at least one of the edges of the solids are parallel to VP.
3. A cone of base diameter 40 mm and height 50 mm rests centrally over a frustum of a pentagonal pyramid of base side 45 mm and top side 35 mm and height 55 mm. Draw the isometric projections of the solids.
4. The following fig shows the top view of the cylinder which is centrally mounted on a frustumof pentagonal pyramid of 60 mm height. Draw the isometric projection of the combination of solids.



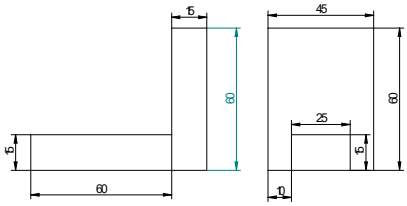
5. Following fig shows the front view of the combination of solids consisting a cut sphere and frustums of a cone and a square pyramid. Draw the isometric projections of the combination of solids.



6. A sphere of diameter 30 mm rests on the frustum of a hexagonal pyramid base 30 mm, top face 18 mm and the height 50 mm such that the axes coincide. Draw the isometric projection of the combination of the solids.
7. Following fig shown the front and side views of the solid. Draw the isometric projection of the solid.



8. Following fig shows the front and side views of the solid. Draw the isometric projection of the solid

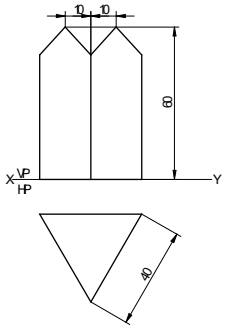


9. A sphere of diameter 40 mm is placed centrally on the flat face of the hemisphere dia 60 mm. Draw the isometric projection of the combination.
10. Three rectangular slabs (l x b x h) 100 mm x 60 mm x 20 mm, 100 mm x 40 mm x 20 mm and 100 mm x 20 mm x 20 mm are placed one above the other in the descending order of their width b such that their longer axes are coplanar. Draw the isometric projection of the combination.

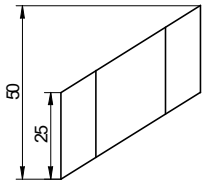
Module – IV

Development of Lateral Surfaces of Solids

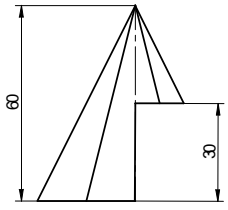
1. Draw the development of truncated portion of lateral faces of pentagonal prism of 20 mm sides of base and 50 mm height standing vertically with one of its rectangular faces parallel to VP and nearer to it so as to produce one piece development. The inclined face of the truncated prism is 30 deg to its axis an passes through the right extreme corner of the top face of the prism.
2. A triangular prism with one of its rectangular faces parallel to VP and nearer to it is cut as shown in the fig. Draw the development of the retained portions of the prism which are shown in dark lines.



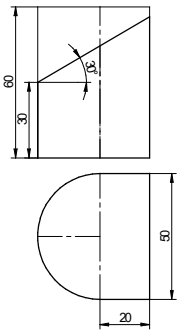
3. A hexagonal prism of base side 20 mm and height 50 mm is resting on HP on its base, such that one of its base edge is parallel to VP. The prism is cut in this position as shown in the following front view. Draw the development of the lateral surface of the prism.



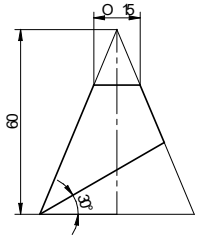
4. The inside of the hopper of the floor mill is to be lined with thin sheet. The top and bottom of the hopper are regular pentagon with each side equal to 30 mm and 22.5 mm respectively. The height of the hopper is 30 mm. Draw the shape of the sheet to which it is to be cut so as to fit into the hopper.
5. A square pyramid of side of base 45 mm, altitude 70 mm is resting with its base on HP with two sides of the base parallel to VP. The pyramid is cut by section plane which is perpendicular to VP and inclined at 40 deg to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces of the truncated pyramid.
6. The hexagonal pyramid of 30 mm base sides with a side of the base parallel to VP. Draw the development of the lateral surfaces of the retained portions of the pyramid cut by two perpendicular planes shown by dark lines in the fig.



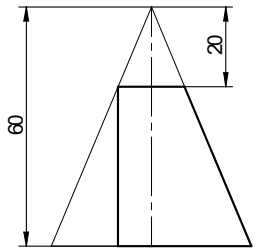
7. A pipe made of using half tubular (circular) with a half square in shape is cut as shown in the following in the fig. Draw the development of the lateral surface of the object.



8. Draw the development of the lateral surface of the cone whose front view is shown in the following fig.



9. A funnel is to be made of sheet metal. A funnel tapers from 40 mm to 20 mm diameter to a height of 20 mm and from 20 mm to 15 mm diameter for the next 20 mm height. The bottom of the funnel is beveled off to a plane inclined at 45 deg to the axis. Draw the development of the funnel.
10. Draw the development of lateral surface of the cut cone whose front view is shown in the fig.



Module-V

Multidisciplinary Applications & Practice

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

Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains,

Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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.

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

	S J P N Trust's **Hirasugar Institute of Technology, Nidasoshi** *Inculcating Values, Promoting Prosperity* Approved by AICTE, New Delhi, Permanently Affiliated to VTU, Belagavi Recognized under 2(f) &12B of UGC Act, 1956 Accredited at 'A' Grade by NAAC & Programmes Accredited by NBA: CSE & ECE	**First Year Engg. Dept.** **Academics** **Course Plan** **2023-24 (Evn)**

Prepared by	Checked by		
Prof.Girish Zulapi	**Prof.D.N.Inamdar**	**HOD**	**Principal**

Subject Title	**RENEWABLE ENERGY SOURCES**		
Subject Code	BETCK205E	**CIE**	50
Number of Lecture Hrs / Week	3Hrs	**SEE**	50
Total Number of Lecture Hrs	40	**Exam Hours**	03
CREDITS – 03			

FACULTY DETAILS:		
Name:Onkar B Heddurshetti	**Designation:** AssistantProfessor	**Experience:18**Years
No. of times course taught:03	**Specialization:**Power Electronics	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	PUC	1st&2nd Year	Physics, Mathematics

2.0 Course Objectives

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

3.0 Course Outcomes

Having successfully completed this course, the student will be able to

CO'S	Course Outcome	RBT Level	POs
C139.1	Describe the environmental aspects of renewable energy resources in comparison with various conventional energy systems, their prospectus and limitations	L1,L2	PO1,PO6,PO7,PO8,PO9& PO12
C139.2	Describe the use of solar energy and various components used in the energy production with respect to applications like heating, cooling, desalination, power generation	L1,L2	PO1, PO6,PO7,PO8,PO9 & PO12
C139.3	Understand the conversion principles of wind and biomass energy	L1,L2	PO1,PO6,PO7,PO8,PO9 & PO12
C139.4	Understand the concept of tidal energy resources and ocean thermal energy conversion.	L1,L2	PO1, PO6,PO7,PO8,PO9 & PO12
C139.5	Acquire the basic knowledge of hydrogen energy	L1,L2	PO1,PO6,PO7,PO8,PO9 & PO12
Total Hours of instruction		**40**	

4.0 Course Content

Module - 1

Introduction: Principles of renewable energy; energy and sustainable development, fundamentals and social implications. worldwide renewable energy availability, renewable energy availability in India, brief descriptions on solar energy, wind energy, tidal energy, wave energy, ocean thermal energy, biomass energy, geothermal energy, oil shale. Introduction to Internet of energy (IOE). **8 Hours**

Module- 2

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

Solar electric power generation- Principle of Solar cell, Photovoltaic system for electric power generation, advantages, Disadvantages and applications of solar photovoltaic system. **8 Hours**

Module- 3

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

Biomass Energy: Introduction; Photosynthesis Process; Biofuels; Biomass Resources; Biomass conversion technologies -fixed dome; Urban waste to energy conversion; Biomass gasification (Downdraft). **8 Hours**

Module- 4

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

Ocean Thermal Energy Conversion: Principle of working, OTEC power stations in the world, problems associated with OTEC. **8 Hours**

Module- 5

Green Energy: Introduction, Fuel cells: Classification of fuel cells – H_2; Operating principles, Zero energy Concepts. Benefits of hydrogen energy, hydrogen production technologies (electrolysis method only), hydrogen energy storage, applications of hydrogen energy, problem associated with hydrogen energy. **8 Hours**

5.0 Relevance to future subjects

Sl. No	Semester	Subject	Topics
01	VIII	Project work	Implementation of renewable energy based projects

6.0 Relevance to Real World

Sl.No	Real World Mapping
01	Residential uses of renewable energy
02	Get the idea about energy consumption of World and India.
03	Jobs related to Renewable energy sources. E.g.-Nuclear power plant, Hydro power plant.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Industrial visit	Practical exposure of renewable energy sources.

8.0 Books Used and Recommended to Students

Suggested Books

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

Additional Study material & e-Books

4. Principles of Energy conversion, A. W. Culp Jr.,, McGraw Hill, 1996
5. Non-Convention Energy Resources, ShobhNath Singh, Pearson, 2018

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
• E-book URL: https://www.pdfdrive.com/non-conventional-energy-sources-e10086374.html
• E-book URL: https://www.pdfdrive.com/non-conventional-energy-systems-nptel- d17376903.html
• E-book URL: https://www.pdfdrive.com/renewable-energy-sources-and-their-applications- e33423592.html
• E-book URL: https://www.pdfdrive.com/lecture-notes-on-renewable-energy-sources- e34339149.html
• https://onlinecourses.nptel.ac.in/noc18ge09/preview

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	Energy & Environment	https://en.wikipedia.org/wiki/Energy_%26_Environment
2	Journal of Renewable and Sustainable Energy	https://en.wikipedia.org/wiki/Journal_of_Renewable_and_Sustainable_Energy
3	Solar Energy Journal	https://en.wikipedia.org/wiki/Solar_Energy_(journal)
4	Renewable and Sustainable Energy Reviews	https://en.wikipedia.org/wiki/Renewable_and_Sustainable_Energy_Reviews

11.0 Examination Note

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 IA tests each of 25Marks, Average of best two IA tests will be final IA marks.

- 1st, 2nd, and 3rd 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/ courseproject/Skill development activities, suitably planned to attain the COs and POs for a total of25Marks(1 Quiz-10 marks and 1 assignment 15 marks) .If the nature of the courses requires assignments/Seminars/Quizzes/group discussion twoevaluation components shall be conducted. If course project/field survey/skill developmentactivities etc then the evaluation method shall be one.Total CIE marks (IA+assignment+quiz=25+15+10= 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.

12.0 Course Delivery Plan

Module	Lecture No.	Content of Lecturer	Teaching Method	% of Portion
1	1	Introduction:Principles of renewable energy	Chalk and Talk, PPT	20%
	2	Energy and sustainable development, fundamentals and social implications.	Chalk and Talk, PPT	
	3	Worldwide renewable energy availability, renewable energy availability in India	Chalk and Talk, PPT	
	4	Brief descriptions on solar energy, wind energy	Chalk and Talk, PPT	
	5	Tidal energy, wave energy, Ocean thermal energy	Chalk and Talk, PPT	
	6	Biomass energy	Chalk and Talk, PPT	
	7	Geothermal energy, oil shale	Chalk and Talk, PPT	
	8	Introduction to Internet of energy (IOE)	Chalk and Talk, PPT	
2	9	Solar Energy: Fundamentals; Solar Radiation; Estimation of solar radiation on horizontal and inclined surfaces	Chalk and Talk, PPT	20%
	10	Solar radiation Measurements- Pyrheliometers	Chalk and Talk, PPT	
	11	Pyrometer, Sunshine Recorder	Chalk and Talk, PPT	
	12	Solar Thermal systems: Flat plate collector	Chalk and Talk, PPT	
	13	Solar distillation; Solar Pond electric power plant	Chalk and Talk, PPT	
	14	Solar electric power generation- Principle of Solar cell	Chalk and Talk, PPT	
	15	Photovoltaic system for electric power generation	Chalk and Talk, PPT	
	16	Advantages, Disadvantages and applications of solar photovoltaic system	Chalk and Talk, PPT	
3	17	Wind Energy: Properties of wind, availability of wind energy in India	Chalk and Talk, PPT	20%
	18	Wind velocity and power from wind; major problems associated with wind power	Chalk and Talk, PPT	
	19	Components of wind energy conversion system (WECS); Horizontal axis- single, double and multiblade system	Chalk and Talk, PPT	
	20	Vertical axis- Savonius and darrieus types	Chalk and Talk, PPT	
	21	Biomass Energy: Introduction; Photosynthesis Process; Biofuels	Chalk and Talk, PPT	
	22	Biomass Resources; Biomass conversion technologies -fixed dome	Chalk and Talk, PPT	
	23	Urban waste to energy conversion	Chalk and Talk, PPT	
	24	Biomass gasification (Downdraft)	Chalk and Talk, PPT	
4	25	Tidal Power: Tides and waves as energy suppliers and their mechanics	Chalk and Talk, PPT	20%
	26	fundamental characteristics of tidal power	Chalk and Talk, PPT	
	27	Harnessing tidal energy	Chalk and Talk, PPT	
	28	Advantages and limitation	Chalk and Talk, PPT	
	29	Ocean Thermal Energy Conversion	Chalk and Talk, PPT	
	30	Principle of working	Chalk and Talk, PPT	
	31	OTEC power stations in the world	Chalk and Talk, PPT	
	32	Problems associated with OTEC	Chalk and Talk, PPT	
5	33	Green Energy: Introduction, Fuel cell	Chalk and Talk, PPT	20%
	34	Classification of fuel cells – H2	Chalk and Talk, PPT	
	35	Operating principles	Chalk and Talk, PPT	
	36	Zero energy Concepts	Chalk and Talk, PPT	
	37	Benefits of hydrogen energy	Chalk and Talk, PPT	
	38	Hydrogen production technologies (electrolysis method only	Chalk and Talk, PPT	
	39	Hydrogen energy storage, applications of hydrogen energy	Chalk and Talk, PPT	
	40	Problems associated with hydrogen energy	Chalk and Talk, PPT	

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: Introduction to Renewable Energy Sources,Solar Energy andWind Energy, Biomass energy, wave energy, tidal energy, OTEC and green energy.	Students study the Topics and write answer. Get practice to solve university questions.	1,2,3,4 and 5 module of the syllabus	12	Individual Activity.	Book 1, 2 of the reference list. Website of the Reference list
3	Quiz: All the module	Students study the Topics and prepare the multiple choice questioner with answer.	All Moduleso f the syllabus	12	Group Activity.	Book 1, 2 of the reference list. Website of the Reference list

15.0 QUESTION BANK

Sample Questions	Questions
1.	**Module 1** 1. Explain principles of renewable energy 2. Explain Energy and sustainable development, 3. Give fundamentals and social implications. 4. Describe worldwide renewable energy availability and renewable energy availability in India 5. Briefly describe solar energy 6. Briefly describe wind energy 7. Briefly describe tidal energy 8. Briefly describewave energy 9. Briefly describe ocean thermal energy 10. Briefly describe biomass energy 11. Briefly describe geothermal energy and oil shale. 12. Explain Introduction to Internet of energy (IOE)
2.	**Module 2** 1. Explain Solar Radiation geometry 2. discuss Estimation of solar radiation on horizontal and inclined surfaces 3. Explainsolar radiation Measurements- Pyrheliometers, Pyrometer, Sunshine Recorder. 4. Explain with sketch working of solar Flat plate collector 5. Explain with sketch working ofSolar distillation 6. Explain with sketch working of solar pond electric power plant. 7. Explain Principle of Solar cell, 8. Explain with sketch working ofPhotovoltaic system for electric power generation, 9. Give advantages, Disadvantages solar photovoltaic system 10. Give applications of solar photovoltaic system.
3.	**Module 3** 1. What is wind power explain briefly? 2. Describe with a neat sketch the working of wind energy system with main components 3. How power extracted by wind turbine? 4. List out type of wind turbine and what are the wind power plants are grouped 5. Discuss the advantages and disadvantages of horizontal and vertical axis wind mill.

	6. What methods are used to overcome the fluctuate power generation of wind mill? 7. What are the advantages and disadvantages of wind turbine? 8. How performance of the wind turbine is determined? Explain its operational characteristics. 11. What is biomass, bio-fuel, bio energy and biogas? 12. What are the methods used for biomass conversion to energy? Explain in brief? 13. What are the factors affecting the generation of bio gas? 14. What are the constituents of biomass materials? 15. What is fermentation, aerobic and anaerobic, hydrolysis explain each. 16. Explain fixed dome bio digester with sketch 17. With a neat sketch explain downdraft biomass gasifiier?
4.	**Module 4** 1. What is tide? Explain tidal energy and its conversion with neat diagram 2. Explain the basic components of a tidal thermal power plant 3. Whate are advantages and disadvantages tidal power generation. 4. What is the nature of tidal power extracted from single basin arrangement and double basin arrangement? 5. What are the wave energy conversion machines, explain any one conversion methods. 6. What is the basic principle of ocean thermal energy conversion? 7. What are the main types of OTEC power plants? Describe their working in brief. 8. What are advantages and disadvantages
5.	**Module 5** 1. What are Fuel cells 2. Classify of fuel cells 3. Explain Operating principles of fuel cells 4. Explain Zero energy Concepts. 5. What are Benefits of hydrogen energy 6. Explain hydrogen production technologies electrolysis method 7. Describe hydrogen energy storage 8. Give applications of hydrogen energy 9. What are problems associated with hydrogen energy.

Prepared by	Checked by		
Prof.O.B.Heddurshetti	**Prof.H. R. Zinage**	**HOD**	**Principal**

Professional Writing Skills in English			
Subject Code	**BPWSK206**	**CIE Marks**: IA-Tests(20) + Assignments(10)+	**50**
Teaching Hours/Week (L:T:P:S)	**2:0:0:0**	**SEE Marks**	**50**
Total Hours of Pedagogy	**02 Hours/Week**	**Total marks (CIE + SEE)**	**100**
Credits	**02**	**SEE Hours**	**02**

FACULTY DETAILS:		
Name: Prof. B. S. Hooli	**Designation:** Lecturer	**Experience:** 20 Yrs
No. of times course taught: 2	**Specialization:** English	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	-	-	Basic English Skills

2.0 Course Objectives

The course (BPWSK206) will enable the students,

- To Identify the Common Errors in Writing and Speaking of English.
- To Achieve better Technical writing and Presentation skills for employment.
- To read Technical proposals properly and make them to Write good technicalreports.
- Acquire Employment and Workplace communication skills.
- To learn about Techniques of Information Transfer through presentation indifferent level.

3.0 Course Outcomes

At the end of the course (BPWSK206) the student will be able:

CO	Course Outcome	Cognitive Level	POs
C112.1	To understand and identify the Common Errors in Writing and Speaking.	L1,L2	1,2,3,8,10
C112.2	To Achieve better Technical writing and Presentation skills.	L1,L2,L3	1,2,3,8,10

C112.3	To read Technical proposals properly and make them to Write good technical reports.	L1,L2,L3	1, 2, 3,8,10

C112.4	Acquire Employment and Workplace communication skills.	L1,L2,L3	1, 2,3,8,10
C112.5	To learn about Techniques of Information Transfer through presentation in different level.	L1,L2,L3	1, 2,3,8,10

4.0 Course Content

Module-1

Identifying Common Errors in Writing and Speaking English:

- Advanced English Grammar for Professionals with exercises, Common errors identification in parts of speech, Use of verbs and phrasal verbs, Auxiliary verbs and their forms, Subject Verb Agreement (Concord Rules with Exercises).
- Common errors in Subject-verb agreement, Noun-pronoun agreement, Sequence of Tenses and errors identification in Tenses. Advanced English Vocabulary and its types with exercises – Verbal Analogies, Words Confused/Misused.

Module -2

Nature and Style of sensible writing:

- Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion, Importance of Proper Punctuation, The Art of Condensation (Precise writing) and Techniques in Essay writing, Common Errors due to Indianism in English Communication, Creating Coherence and Cohesion, Sentence arrangements exercises, Practice of Sentence Corrections activities. Importance of Summarising and Paraphrasing.
- Misplaced modifiers, Contractions, Collocations, Word Order, Errors due to the Confusion of words, Common errors in the use of Idioms and phrases, Gender, Singular & Plural. Redundancies & Clichés.

Module- 3

Technical Reading and Writing Practices:

- Reading Process and Reading Strategies, Introduction to Technical writing process,
- Understanding of writing process, Effective Technical Reading and Writing Practices , 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 – Voice and Speech (Active and Passive Voices) and Reported Speech, Spotting Error Exercises, Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.

Module- 4

Professional Communication for Employment:

- The Listening Comprehension, Importance of Listening Comprehension, Types of Listening, Understanding and Interpreting, Listening Barriers, Improving Listening Skills. Attributes of a good and poor listener.
- Reading Skills and Reading Comprehension, Active and Passive Reading, Tips for effective reading.
- Preparing for Job Application, Components of a Formal Letter, Formats and Types of official, employment, Business Letters, Resume vs Bio Data, Profile, CV and others, Types of resume, Writing effective resume for employment, Model Letter of Application (Cover Letter) with Resume, Emails, Blog Writing, Memos (Types of Memos) and other recent communication types.

Module-5

Professional Communication at Workplace:

- Group Discussions – Importance, Characteristics, Strategies of a Group Discussions. Group Discussions is a Tool for Selection. Employment/ Job Interviews - Importance, Characteristics,

Strategies of a Employment/ Job Interviews. Intra and Interpersonal Communication Skills - Importance, Characteristics, Strategies of a Intra and Interpersonal Communication Skills. Non-Verbal Communication Skills (Body Language) and its importance in GD and PI/JI/EI.

- Presentation skills and Formal Presentations by Students - Importance, Characteristics, Strategies of Presentation Skills. Dialogues in Various Situations (Activity based Practical Sessions in class by Students).

5.0 Suggested Learning Resources

Text Books

1. **A Course in Technical English,** Cambridge University Press – 2020.
2. **Functional English (As per AICTE 2018 Model Curriculam)** Cengage learning India Pvt Limited [Latest Revised Edition] - 2020.
3. **Communication Skills** by Sanjay Kumar and Pushp Lata, Oxford University Press - 2018. Refer it's workbook for activities and exercises – "Communication Skills – I (A Workbook)" published by Oxford University Press – 2018.
4. **Professional Writing Skills in English,** Infinite Learning Solutions – (Revised Edition) 2021.
5. **Technical Communication –** Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017.
6. **High School English Grammar & Composition** by Wren and Martin, S Chandh & CompanyLtd – 2015.
7. **Effective Technical Communication** – Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private Limited – 2018.
8. **Intermediate Grammar, Usage and Composition** by M.L.Tichoo, A.L.Subramanian,

6.0 Examination Note

Assessment Details (both CIE and SEE):

Continuous internal evaluation (CIE) needs to be conducted for 50 marks like Engineering courses. The weight age of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 40% of maximum marks in CIE and 35% of maximum marks in SEE to pass. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration). Based on this grading will be awarded.

Continuous Internal Evaluation (CIE) :

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

All the tests are preferred similar to SEE pattern; however, the teacher may follow test pattern similar to other theory courses of Engineering.

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester.

5. Second assignment at the end of 9th week of the semester.

Report writing /Group discussion/Seminar any one of three suitably planned to attain the COsand POs for **20 Marks (duration 01 hours)**

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100marks and will be **scaled down to 50 marks**

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

Semester End Examinations (SEE)

SEE paper will be set for 100 questions of each of 01 marks. The pattern of the question paper is MCQ. The time allotted for SEE is 120 minutes. Marks scored are scaled down to 50 Marks.
(Time duration may be made 90 minutes to train the students for engineering / non-engineering competitive examination)

1. Professional Writing Skills in English has become a very important component in all engineering and non-engineering competitive examinations. In exams like GRE, TOEFL, IELTS and GATE exam, all state and Central Government recruitment examinations, placement tests and other Examinations, so the pattern of question paper, in general, will be in multiple-choice question (MCQ) Pattern. So, to meet the relevance of the recruitment requirement of our Engineering students "Professional writing skill in English" Semester end examination (SEE) will be conducted in a multiple choice question (MCQ) pattern.
1. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration).

7.0 Course Delivery Plan

Module	Lecture No.	Content of Lecture		% of Portion
		PART - A	**Teaching-Learning Process**	
1	1	Advanced English Grammar for Professionals with exercises	Chalk &board, PPT, Animation, Active Learning	20
	2	Common errors identification in parts of Speech		
	3	Use of verbs and phrasal verbs, Auxiliary verbs and their forms		
	4	Subject Verb Agreement (Concord Rules with Exercises)		
	5	Common errors in Subject-verb agreement, Noun pronoun agreement, Sequence of Tenses and errors identification in Tenses.		
	6	Advanced English Vocabulary and its types with exercises – Verbal Analogies, Words Confused/Misused.		

2	7	Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion.		20

	8	Importance of Proper Punctuation, The Art of Condensation (Precise writing) and Techniques in Essay writing, Common Errors due to Indianism in English Communication	Chalk & board, Active Learning, Problem based learning	
	9	Creating Coherence and Cohesion, Sentence arrangements exercises, Practice of Sentence Corrections activities. Importance of Summarising and Paraphrasing.		
	10	Misplaced modifiers, Contractions, Collocations, Word Order		
	11	Errors due to the Confusion of words		
	12	Common errors in the use of Idioms and phrases, Gender, Singular & Plural. Redundancies & Cliches.		
3	13	Reading Process and Reading Strategies, Introduction to Technical writing process.	Chalk & board, PPT, Animation, NPTEL, Active Learning	20
	14	Understanding of writing process, Effective Technical Reading and Writing Practices		
	15	Introduction to Technical Reports writing, Significance of Reports, Types of Reports.		
	16	Introduction to Technical Proposals Writing, Types of Technical Proposals, Characteristics of Technical Proposals. Scientific Writing Process.		
	17	Grammar – Voice and Speech (Active and Passive Voices) and Reported Speech.		
	18	Spotting Error Exercises, Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.		
4	19	The Listening Comprehension, Importance of Listening Comprehension, Types of Listening, Understanding and Interpreting, Listening Barriers.	Chalk& board, Problem based learning	20
	20	Improving Listening Skills. Attributes of a good and poor listener.		
	21	Reading Skills and Reading Comprehension, Active and Passive Reading, Tips for effective reading.		
	22	Preparing for Job Application, Components of a Formal Letter, Formats and Types of official, employment, Business Letters.		
	23	Resume vs Bio Data, Profile, CV and others, Types of resume, Writing effective resume for employment		
	24	Model Letter of Application (Cover Letter) with Resume, Emails, Blog Writing, Memos (Types of Memos) and other recent communication types.		
5	25	Group Discussions – Importance, Characteristics, Strategies of a Group Discussions.	Chalk& board, Problem based learning	20
	26	Group Discussions is a Tool for Selection. Employment/ Job Interviews - Importance, Characteristics, Strategies of a Employment/ Job Interviews.		

	27	Intra and Interpersonal Communication Skills - Importance, Characteristics, Strategies of a Intra and Interpersonal Communication Skills		
	28	Non-Verbal Communication Skills (Body Language) and its importance in GD and PI/JI/EI.		
	29	Presentation skills and Formal Presentations by Students - Importance, Characteristics, Strategies of Presentation Skills.		
	30	Dialogues in Various Situations (Activity based Practical Sessions in class by Students).		

Examination	S+	S	A	B	C	D	E	F	% Passing
JAN - 2021									
JAN - 2020									
JAN - 2019									

Prepared by	Checked by		
Prof. B. S. Hooli	Dr. K. B. Manwade	HOD	Principal

Subject Title	**INNOVATION and DESIGN THINKING**		
Subject Code	BIDTK258	**CIE(50)+SEE(50)**	100
Number of Lecture Hrs/Week	1L	**Exam Marks(appearing for)**	100 & reduced to 50 for grade
Total Number of Lecture Hrs	15	**Exam Hours**	01 per division
CREDITS – 01			

FACULTY DETAILS:		
Name: Dr.Sshashikant Walki	**Designation:** Asst. Professor	**Experience:** 08 years
No. of times similar course taught:03	**Specialization:** Chemistry	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	Any	PUC level	Reasoning, Analytical & Critical thinking abilities

2.0 Course Objectives

- To explain the concept of design thinking for product and service development
- To explain the fundamental concept of innovation and design thinking
- To discuss the methods of implementing design thinking in the real world.

3.0 Course Outcomes

CO	Course Outcome	RBTL	POs
C109.1	Appreciate various design process procedure	L2	PO1-PO7, PO9, PO11 & PO12
C109.2	Generate and develop design ideas through differenttechnique	L2	PO1-PO7, PO9, PO11 & PO12
C109.3	Identify the significance of reverse Engineering to Understand products	L2	PO1-PO7, PO9, PO11 & PO12
C109.4	Draw technical drawing for design ideas	L3	PO1-PO7, PO9, PO11 & PO12
C109.5	Empathizing prototyping & testing	L1	PO1-PO7, PO9, PO11 & PO12

4.0 University Course Content

Module-1
PROCESS OF DESIGN
Understanding Design thinking
Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping
Module-2
Tools for Design Thinking
Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design

Module-3

Design Thinking in IT :

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

Module-5

Design thinking workshop:

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

5.0 Relevance to future Subjects/Lab/Project

Sl. No	Semester	Subject/Lab/Project	Topics
01	All Sem	Subjects, labs and Project include Design & development of engineering systems. Solving of complex engineering problems through innovations through multidisciplinary concepts Business modeling and prototyping	All modules

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Resolving real time problems and issues by innovation and design thinking
02	Solving of complex engineering problems through innovations through multidisciplinary concepts
03	Business modeling and prototyping

7.0 Gap Analysis and Mitigation

Sl. No	Gap/s	Mitigation
01	Ability to think, design and complete project	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
02	Ability to develop ideas and convert them to product	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
03	Ability to make prototype and analyze	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
04	Ability to resolve real-time problems with available resources	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.

8.0 Books Used and Recommended to Students

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. HassoPlattner, ChristophMeinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
4. IdrisMootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

References

5. YousefHaik 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).

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

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

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

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

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	Elsevier	https://www.journals.elsevier.com
2	Journal of Composite Materials	http://journals.sagepub.com
3	Journal of Manufacturing Science and Engineering	http://manufacturingscience.asmedigitalcollection.asme.org
4	International Journal of Renewable Energy Research (IJRER)	http://www.ijrer.org

11.0 Examination Note

Methods of CIE need to be defined topic wise i.e.- Tests, MCQ, Quizzes, Seminar or micro project/Course Project, Term Paper)
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 35% of maximum marks in SEE and a minimum of 40% of maximum marks in CIE. Semester End Exam (SEE) is conducted for 100 marks (3 hours' duration) and scaled down to 50 marks. Based on this grading will be awarded.
The student has to score 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.

12.0 Course Delivery Plan

Module	Content of Lecturer	Delivery	Cumulative Coverage

1	Understanding Design thinking: Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping	Chalk & Talk & Video of live examples	20%
2	Tools for Design Thinking: Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design	Chalk & Talk, Case Studies & Video of live examples	40%
3	Design Thinking in IT: Design Thinking to Business Process modeling – Agile in Virtual collaboration environment – Scenario based Prototyping	Case Studies & Simulation	60%
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.	Business Models, Presentation and Live Projects	80%
5	Design thinking workshop: Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test	Presentation	100%

13.0 Continuous Internal Evaluation (CIE)

Module	CIE Method	Marks	Conduction
1,2,3,4 &5	3 IA Tests Duration:1 hour	Conduction for 50 marks & reduced to 20 marks	I IA-5th week, II IA-10th week & III IA-15th week
	2 Assignments	Each assignment evaluation for 25 marks & average of all assignments shall be reduced to 10 marks	I Asignment-4thweek &II Assignment-9th week
	Report writing or presentation or Seminar or GD	Each activity shall be evaluated for 50 marks with proper rubrics and average of all evaluations shall be reduced to 20 marks	13th week

Module	Topic	CIE Method
1	Understanding Design Thinking	MCQ/Term paper
2	Tools for Design Thinking	MCQ/Case Study Presentation Evaluation/Simulation Evaluation
3	Design Thinking in IT	MCQ/Case Study Presentation Evaluation/Simulation Evaluation
4	DT for Strategic Innovations	Seminar presentation on design/ micro-project on design thinking
5	Design Thinking Workshop	Workshop presentation/Course project

13.0 Semester End Examination (SEE)

VisvesvarayaTechnological University will conduct the MCQ SEE for maximum for 50 marks. There will be 50 questions carrying 01mark each. The duration of the SEE will be 1hour.

15.0 QUESTION BANK (to be prepare)

16.0 University Result

VTU Examination	S+	S	A	B	C	D	E	F	% Passing
Dec.21-Jan.22 VTU SEE									100
FEB-MARCH 2023 VTU SEE									100

Prepared by	Checked by		
Dr.S.N.Topannavar	Module Coordinator	HOD	Principal

Subject Title	Balake Kannada		
Subject Code	BKBKK207	CIE Marks	50
		SEE Marks	50
Number of Lecture Hrs / Week	1	Total Marks	100
Total Number of Lecture Hrs	15	Exam Hours	1 H
Credits: 1			

FACULTY DETAILS:		
Name: Smt. B S KOTEPPAGOL	Designation: Asst. Professor	Experience: 05
No. of times course taught:5	Specialization: MA IN KANNADA	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
1			

2.0 Course Objectives

1. To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
2. To enable learners to Listen and understand the Kannada language properly.
3. To speak, read and write Kannada language as per requirement.
4. To train the learners for correct and polite conservation

3.0 Course Outcomes

At the end of the Course, The Students will be able

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

4.0 Course Content

Module-1

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

Module-2

1. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು
   Possessive forms of nouns, dubitive question and Relative nouns
2. ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು
   Qualitative, Quantitative and Colour Adjectives, Numerals.
3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ)
   Predictive Forms, Locative Case

Module-3

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

Module-4

1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು
   Permission, Commands, encouraging and Urging words (Imperative words and sentences)
2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು
   Accusative Cases and Potential Forms used in General Communication
3. "ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು
   Helping Verbs"iru and iralla", Corresponding Future and Negation Verbs
4. ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ
   Comparitive, Relationship, Identification and Negation Words

Module-5

1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು
   ifferent types of forms of Tense, Time and Verbs

2. ದ್,-ತ್,-ತು,- ಇತು, - ಆಗಿ, -ಅಲ್ಲ,-ಗ್,-ಕ್, ಇದೆ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ - Formation of Past, Future and Present Tense Sentences with Verb Forms
3. Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation

5.0 Relevance to future subjects

Sl.No.	Semester	Subject	Topics
			-
			-

6.0 Relevance to Real World

Sl.No	Real World Mapping

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details

8.0 Books Used and Recommended to Students

Text Books

Balake Kannada

Reference books

1. ಸಂಕ್ಷಿಪ್ತ ಕನ್ನಡ ನಿಘಂಟು (ಪರಿಷತ್ತು), ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್, ಬೆಂಗಳೂರು
2. ಕನ್ನಡ ಕಲಿ ಪಠ್ಯಪುಸ್ತಕ – ಲಿಂಗದೇವರು ಹಳೆಮನೆ, ಪ್ರಸಾರಾಂಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/ Animation/ Videos Recommended

Website and Internet Contents References

10.0 Magazines/Journals Used and Recommended to Students

Sl. No	Magazines/Journals	Website
3		

11.0 Examination Note

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 25 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 25 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 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.

12.0 Course Delivery Plan

Module	Lecture No./Practical Session	Content of Lecture	% of Portion
Module-1	L-1	Introduction, Necessity of learning a local language. Methods to learn the Kannada language.	20
	L-2	Easy learning of a Kannada Language: A few tips. Hints for correct and polite conservation, Listening and Speaking Activities, Key to Transcription.	
	L-3	ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು Personal Pronouns, Possessive Forms, Interrogative words.	
Module-2	L-1	ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು Possessive forms of nouns, dubitive question and Relative nouns	20
	L-2	ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and Colour Adjectives, Numerals	
	L-3	ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case	
Module-3	L-1	ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು -Dative Cases, and Numerals	20
	L-2	ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal numerals and Plural markers	
	L-3	ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು ಮತ್ತು ವರ್ಣ ಗುಣವಾಚಕಗಳು Defective / Negative Verbs and Colour Adjectives	
Module-4	L-1	ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು Permission, Commands, encouraging and Urging words (Imperative words and sentences)	20
	L-2	ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು Accusative Cases and Potential Forms used in General Communication	

	L-2	."ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು Helping Verbs"iru and iralla", Corresponding Future and Negation Verbs	
	L-3	ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ Comparitive, Relationship, Identification and Negation Words	
Module-5	L-1	ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು Different types of forms of Tense, Time and Verbs	20
	L-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	
	L-3	Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation	

13.0 QUESTION BANK

Note: Fill in the blankto translating the given English word to Kannada word.

Q.1) We_____
a) avaru b)ivaru c)avlud d)naavu

Q.2) She_____
a) avanu b)adu c)avaLu d)idu

Q.3) It_____
a) naavu b)adu c)niivu d)ivaru

Q.4) You_____
a) naavu b)adu c)niivu d)ivaru

Q.5) They_____
a) avara b)avaru c)avarind d)ivaru

Note: Substitute the correct word to the under lined words in the following sentences.

Q.6) avaru huuDugar iddare
a) huDugaru b) huDuga c) huuDaga d) huDuug

Q.7) avaLu huDuugi iddaLe
a) huuDugi b) huDugi c) Girl d) Lady

Q.8) adu mani iruttade
a) home b) house c) mane d) college

Q.9) Santosh kaalejige huguttare
a) hoguttaLe b) baruttane c) hoguttane d) goining

Q.10) Ravi haasTelanalli iruttani
a) iruttaLe b) iruvaru c) iddare d) iruttane

Q.11) tande_____
a) father b) grand father c)mother d) brother

Q.12) tangi_____
a) small sister b) sister c) yonger sister d) elder sister

Note:Write the English word for the given Kannada word.
Q.13) tamma_____
a) brother b) big brother c) smallbrother d) younger brother
Q.14) snehita_____
a) geLeya b) friend c) snehite d) best friend
Q.15) shikshaka_____
a) teacher b) lecturer c) Professor d) Pricipal

Note:Fill in the blank choosing the right word from the group given below.
Q.16) avaLa_____ eenu?
a) hesaru b) hasar c) hasiru d) name
Q.17) manege_____ baa.
a) early b) late c) beega d) taDavagi
Q.18) niinuiiga_____hogidde?
a) where b) there c) ellege d) ellige
Q.19) Ravi _____ankagaLannu paDediddane.
a) heccu b) more c) hecu d) highest
Q.20) niinu snehitarige ____tegedukonDu baa.
a) haNNugaLannu b) haNNagalannu c) hannugalannu d) haNugalannu

Note:Translate the following Kannada sentences into English.
Q.21) idubyaga ide.
a) It is a bag b) It is a book c) It is a pen d) It is a compass
Q.22) nimma hesaru eenu?
a) What is it's name? b) What is your name?
c) What is that's name? d) What is his name?
Q.23) niinu haastelage beega baa.
a) you come to hostel early. b) you came to hostel early
c) you must come to hostel early d) you come fast to hostel
Q.24) nanage gaNita pustaka beeku.
a) I need not mathematics book b) I want mathematics book
c) I wanted mathematics book d) I need mathematics book
Q.25) yaaru baruttare ?
a) Who will come? b) Who will be come?
c) Who will be coming? d) Who is coming?

Note: Translate the following English words into Kannada words.
Q.26) Friend
a) snehita b) tamma c) tangi d) brother
Q.27) Home
a) college b) mane c) house d) room
Q.28) Who
a) yaruu b) yaarinda c) yaaravaru d) yaaru
Q.29) When
a) yaavaaga b) yaavadu c) yandu d) yandininda

Q.30) What
a) enu b) yantu c) yantadu d) eenu

Note: Translate the following English sentence into Kannada .
Q.31) May I go there.
a) naanu allige hogabahude b) naanualligehoguttene
c) naan uallige hogalu sadhyavide d) naan uallige hoguvaniddene
Q.32) I am writing an assignment.
a) naanu assignment bareyuvaniddene. b) naanu assignment barediddene.
c) naanu assignment bareyuttene. d) naanu assignment bareyuttiddene.

Q.33) Who told him?
a) avanige yaaru heLidaru? b) avanige yaaru heLiddare
c) avanige yaaru heLuttare d) avanige yaaru heLabahudu
Q.34) He is my friend.
a) avanu nanna snehita iddane b) avanu nanna tamma iddane
c) avaLu nanna tangi iddaLe d) avaLu nanna akka iddaLe
Q.35) She is girl
a) avaLu gruhiNi iddaLe b) avaLu huDugi iddaLe
c) avanu huDuga iddane d) avaLu tangi iddaLe

Note: Change the word as per model given. Example:avana +adu =avanadu.
Q.36) chikka
a) chikkadu b) chakkadu c) chukkadu d) chokkadu
Q.37) doDDa
a) doDDadu b) doDDudu c) doDDada d) duDDudu
Q.38) oLLeya
a) oLLayadu b) oLLeeyadu c) oLeyadu d) oLLeyadu
Q.39) keTTa
a) keTTavanu b) keTTadu c) keTadu d) keTudu
Q.40) keLagina
a) melinadu b) hindinadu c) keLaginadu d) mundinadu

Note : Transform the following words of Kannada as per the given model. Example:kaTTe+-alli kaTTeyalli
Q.41) mane
a) maniyalli b) maneyolage c) maneyalli d) manegaLalli
Q.42) toTa
a) toTadalli b)holadalli c) toTadoLage d) huudoTadalli
Q.43) bavi
a) bavigaLalli b) baviyalli c) baviyoLage d) bavinalli
Q.44) byagu
a) byaginoLage b) byaginalli c) bogiyalli d) bogiyoLage
Q.45) uuru
a) uuralli b) uurinoLage c) urinalli d) uriinalli

Note : Transform the following words to Kannada as per the given model Example: -mane-manege
Q.46) uuru

a) uurige b) uurinoLage c) uurivarige d) uroTTige

Q.47) avanu
a) avanige b) avarige c) ivarige d) avaLige

Q.48) akka
a) akkanavarige b) akkange c) avakkage d) akkanige

Q.49) naanu_____
a) nanage b) nimage c) avarige d) ivarige

Q.50) amma_____
a) ammanavarige b) ammanige c) ammaLige d) ammavarige

Prepared by Smt.B.S.Koteppagol	1st year co-ordinator	Principal

Subject Title	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Subject Code	BKSKK207	CIE Marks	50
		SEE Marks	50
Number of Lecture Hrs / Week	1	Total Marks	100
Total Number of Lecture Hrs	15	Exam Hours	1 H
Credits: 1			

FACULTY DETAILS:		
Name: Smt. B S KOTEPPAGOL	Designation: Asst. Professor	Experience: 06
No. of times course taught:7	Specialization: MA IN KANNADA	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
1	Kannada medium students	1-10 Standard	kannada Language

2.0 Course Objectives

1. ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸಿ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
3. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
4. ಕನ್ನಡ ಶಬ್ದಸಂಪತ್ತಿನ ಪರಿಚಯ ಮತ್ತು ಕನ್ನಡ ಭಾಷೆಯ ಬಳಕೆ ಹಾಗೂ ಕನ್ನಡದಲ್ಲಿ ಪತ್ರ ವ್ಯವಹಾರವನ್ನು ತಿಳಿಸಿಕೊಡುವುದು.

3.0 Course Outcomes

1. ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ.
3. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.
4. ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.

4.0 ಅಣಧಿಜ ಅಂಟಿಣಜಟಿಣ

ಘಟಕ -1 ಲೇಖನಗಳು

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

ಘಟಕ -2 ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ

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

ಘಟಕ -3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ

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

ಘಟಕ -4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ

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

ಘಟಕ -5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

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

5.0 Relevance to future subjects

Sl.No.	Semester	Subject	Topics
			-
			-

6.0 Relevance to Real World

Sl.No	Real World Mapping

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details

8.0 Books Used and Recommended to Students

Text Books
1.ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಸಮೀಕ್ಷೆ – ಎಚ್ ತಿಪ್ಪೇರುದ್ರಸ್ವಾಮಿ.
2. ಕರ್ನಾಟಕ ಗತವೈಭವ – ಆಲೂರ ವೆಂಕಟರಾಯ
3. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ರಂ. ಶ್ರೀ ಮುಗಳಿ
4. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ತ.ಸು. ಶಾಮರಾಯ
5. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ಎಲ್. ಎಸ್. ಶೇಷಗಿರಿರಾವ್.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/ Animation/ Videos Recommended

Website and Internet Contents References

10.0 Magazines/Journals Used and Recommended to Students

Sl. No	Magazines/Journals	Website

11.0 Examination Note

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 25 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 25 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 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.

12.0 Course Delivery Plan

Module	Lecture No./Practical Session	Content of Lecture	% of Portion
ಘಟಕ –1	L-1	ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ	20
	L-2	ಕರ್ನಾಟಕದ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ	
	L-3	ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ	
ಘಟಕ –2	L-1	ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ	20
	L-2	ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ,ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ	
	L-3	ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು - ಶಿಶುನಾಳ ಶರೀಫ	
ಘಟಕ –3	L-1	ಡಿವಿಜಿ ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ದ ಕೆಲವು ಭಾಗಗಳು	20
	L-2	ಕುರುಡು ಕಾಂಚಾಣ : ದಾ.ರಾ. ಬೇಂದ್ರೆ	
	L-3	ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು	
ಘಟಕ -4	L-1	ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ – ಎ. ಎನ್. ಮೂರ್ತಿರಾವ್	20
	L-2	ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ ಎನ್ ಮೂರ್ತಿರಾವ್	
	L-3	ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ	
ಘಟಕ -5	L-1	ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ	20
	L-2	ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ	
	L-3	ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	

13.0 QUESTION BANK

ಘಟಕ -1

1) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ:

1) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಲೇಖನದ ಲೇಖಕರು ಯಾರು?
2) "ಕಬ್ಬಿಗರ ಕಾವ್ಯ" ಕಾವ್ಯ ರಚಿಸಿದ ಕವಿ ಹೆಸರು ಏನು?
3) ಕನ್ನಡದ ಮೊದಲ ಉಪಲಬ್ಧ ಗ್ರಂಥ ಯಾವುದು?
4) ಮಹಾಸತಿ ಎಂದರೆ ಯಾರು?
5) ವಿಜಯನಗರದ ಪ್ರಸಿದ್ಧ ದೊರೆ ಯಾರು ?
6) ಪಂಪ ರಚಿಸಿದ ಕೃತಿಗಳನ್ನು ಹೆಸರಿಸಿ?
7) "ಭರತೇಶ ವೈಭವ' ರಚಿಸಿದ ಕವಿ ಯಾರು?
8) ಹಂಪ ನಾಗರಾಜಯ್ಯ ಜನಿಸಿದ ಊರು ಯವುದು?
9) ಕವಿರಾಜಮಾರ್ಗದ ಕರ್ತೃ ಯಾರು?
10) ಹಂಪ ನಾಗರಾಜಯ್ಯ ಪಡೆದ ಕನ್ನಡದ ಪ್ರತಿಷ್ಠಿತ ಪ್ರಶಸ್ತಿ ಯಾವುದು?

2. ಕರ್ನಾಟಕದ ಏಕೀಕರಣ ; ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ:

1. ಕರ್ನಾಟಕ ಏಕೀಕರಣ ; ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ. ಇದರ ಲೇಖಕರ ಹೆಸರೇನು?
2. ಪ್ರೊ.. ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯನವರ ಜನ್ಮ ಸ್ಥಳ ಯಾವುದು?
3. 'ಇಗೊ ಕನ್ನಡ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
4. ಕರ್ನಾಟಕ ಏಕೀಕರಣ ಎಂದರೇನು?
5. ಸರ್. ಥಾಮಸ್ ಮನ್ರೋ ಯಾರು?
6. ಯಾರ ಪ್ರಯತ್ನದಿಂದ 1890ರಲ್ಲಿ ವಿದ್ಯಾವರ್ಧಕ ಸಂಘ ಸ್ಥಾಪನೆಯಾಯಿತು?
7 'ಕರ್ನಾಟಕ ಗತವೈಭವ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
8. ಕರ್ನಾಟಕ ಏಕೀಕರಣವಾದ ವರ್ಷ ಯವುದು?
9. ಮೈಸೂರ ರಾಜ್ಯಕ್ಕೆ ಕರ್ನಾಟಕವೆಂದು ನಾಮಕರಣ ಮಾಡಿದ ವರ್ಷ ಯವುದು?
10. 1955ರಲ್ಲಿ ರಾಯಚೂರಿನಲ್ಲಿ ನಡೆದ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಸಮ್ಮೇಳನದ ಅಧ್ಯಕ್ಷರು ಯಾರಾಗಿದ್ದರು?

3. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ

ವಸ್ತು ನಿಷ್ಠ ಪ್ರಶ್ನೆಗಳು

1) ಜಗತ್ತಿನಲ್ಲಿ ಹೆಚ್ಚು ಮಂದಿ ಮಾತನಾಡುವ ಭಾಷೆಯೆಂಬ ನೆಲೆಯಲ್ಲಿ ಕನ್ನಡಕ್ಕೆ ಎಷ್ಟನೇ ಸ್ಥಾನ ಸಿಕ್ಕಿದೆ?
2) ಕನ್ನಡ ಭಾಷೆ ಯಾವ ಲಿಪಿಯಿಂದ ರೂಪಗೊಂಡಿದೆ?
3) ವಿನೋಬಾ ಭಾವೆಯವರು ಕನ್ನಡ ಭಾಷೆಯ ಲಿಪಿಯನ್ನು ಏನೆಂದು ಕರೆದಿದ್ದಾರೆ?
4) ಸಂವಿಧಾನದ ಎಷ್ಟನೇ ಅನುಚ್ಛೇದದ ಪ್ರಕಾರ ಆಯಾ ರಾಜ್ಯಗಳಲ್ಲಿ ಬಳಕೆಯಾಗುವ ಭಾಷೆಗಳನ್ನೇ ಆಡಳಿತ ಭಾಷೆಯೆಂದು ತೀರ್ಮಾನಿಸಲಾಗಿದೆ?

5) ಯಾವ ವರ್ಷದಲ್ಲಿ ಸಾರ್ವತ್ರಿಕವಾಗಿ ನ್ಯಾಯಾಲಯಗಳ ತೀರ್ಪಿನ ಭಾಷೆ ಕನ್ನಡವೇ ಆಗಿರಬೇಕೆಂದು ಅಂತಿಮ ಆಜ್ಞೆ ಹೊರಡಿಸಲಾಯಿತು?

ಘಟಕ -2

ಆಧುನಿಕ ಪೂರ್ವ ಕಾವ್ಯ ಭಾಗ

1. ವಚನಗಳು:

1. ಕನ್ನಡದ ಮೊದಲ ಆದ್ಯ ವಚನಕಾರ ಯಾರು?
2. ಜೇಡರ ದಾಸಿಮಯ್ಯನ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
3. ಜೇಡರ ದಾಸಿಮಯ್ಯ ಅಳಿಮನದವನ ಭಕ್ತಿಯನ್ನು ಯಾವುದಕ್ಕೆ ಹೋಲಿಸಿದ್ದಾರೆ?
4. ಅಲ್ಲಮ ಪ್ರಭುಗಳ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
5. ಮೃತ್ಯುವಿನ ಬಾಯಿಗೆ ತುತ್ತಾದವರು ಯಾರು ಎಂದು ಅಲ್ಲಮ ಪ್ರಭುಗಳು ಹೇಳಿದ್ದಾರೆ?
6. ಬಸವಣ್ಣನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
7. .ಬಸವಣ್ಣನವರು ಮರಹು ಘನವಾದರೂ ಯಾವುದನ್ನು ಕಿರಿಯದೆನ್ನಬಾರದೆಂದು ಹೇಳಿದ್ದಾರೆ?
8. ಅಕ್ಕಮಹಾದೇವಿಯ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
9. ಚನ್ನಮಲ್ಲಿಕಾರ್ಜುನ ಯಾರನ್ನು ನರಕದಲ್ಲಿಕ್ಕದೆ ಬಿಡುವುದಿಲ್ಲವೆಂದು ಅಕ್ಕಮಹಾದೇವಿ ಹೇಳಿದ್ದಾಳೆ?
10. ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
11. ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
12. ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ ಯಾರಿಗೆ ಬಡತನವಿಲ್ಲ ಎಂದು ಹೇಳಿದ್ದಾಳೆ?

2. ಕೀರ್ತನೆಗಳು:

1) ಪುರಂದರದಾಸರ ಕೀರ್ತನೆಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
2) 'ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ' ಕೀರ್ತನೆ ರಚಿಸಿದ ದಾಸರ ಹೆಸರೇನು?
3) ಕನಕದಾಸರ ಕೀರ್ತನೆಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
4)'ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೆ' ಕೀರ್ತನೆ ರಚಿಸಿದ ದಾಸರ ಹೆಸರೇನು?

3. ತತ್ಪದಗಳು (ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು)

1) 'ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು' ಈ ತತ್ವಪದವನ್ನು ರಚಿಸಿದವರು ಯಾರು?

ಘಟಕ -3

ಆಧುನಿಕ ಕಾವ್ಯ ಭಾಗ

1. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ

1) ಡಿ.ವಿ.ಜಿ. ಯವರು ಎಲ್ಲಿ ಮತ್ತು ಯಾವಗ ಜನಿಸಿದರು?
2) 'ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
3) ಪದ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿ
   ಹುಲ್ಲಾಗು ಬೆಟ್ಟದಡಿ, ಮನೆಗೆ _____ ಯಾಗು ।
   ಕಲ್ಲಾಗು ಕಷ್ಟಗಳ ಮಳೆಯ ವಿಧಿ ಸುರಿಯೆ ॥

   _____ ।
   ಎಲ್ಲರೊಳಗೊಂದಾಗು ಮಂಕುತಿಮ್ಮ ॥
4) ಹೊಸಚಿಗುರು ಹಳೆ ಬೇರು ಕೂಡಿರಲು _____

2. ಕುರುಡು ಕಾಂಚಾಣಾ

1) ದ. ರಾ. ಬೇಂದ್ರೆಯವರ ಪೂರ್ಣ ಹೆಸರೇನು?
2) ದ. ರಾ. ಬೇಂದ್ರೆಯವರು ಎಲ್ಲಿ ಜನಿಸಿದರು?
3) ದ. ರಾ. ಬೇಂದ್ರೆಯವರ ಕಾವ್ಯನಾಮ ಯಾವುದು?
4) ಬೇಂದ್ರೆಯವರ ಯಾವ ಕವನ ಸಂಕಲನಕ್ಕೆ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿ ಲಭಿಸಿದೆ?
5) ಕುರುಡು ಕಾಂಚಾಣಾ ಕವನವನ್ನು ಯಾವುದರಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
6) ಪದ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿ
   ಕುರುಡು ಕಾಂಚಾಣಾ ಕುಣಿಯುತಲಿತ್ತು
   _____
   ಕುರುಡು ಕಾಂಚಾಣ.

3. ಹೊಸಬಾಳಿನ ಗೀತೆ

1) ಕುವೆಂಪುರವರು ಎಲ್ಲಿ ಮತ್ತು ಯಾವಗ ಜನಿಸಿದರು?
2) ಕುವೆಂಪುರವರ ಪೂರ್ಣ ಹೆಸರೇನು?
3) ಕುಪ್ಪಳ್ಳಿ ವೆಂಕಟಪ್ಪ ಪುಟ್ಟಪ್ಪನವರ ಕಾವ್ಯನಾಮ ಯಾವುದು?
4) 'ಹೊಸಬಾಳಿನ ಗೀತೆ' ಕವನವನ್ನು ಯಾವುದರಿಂದ ಆರಿಸಿಕೊಳ್ಳಲಾಗಿದೆ?
5) 'ನೆನಪಿನ ದೋಣಿ' ಇದು ಯಾರ ಆತ್ಮ ಚರಿತ್ರೆ?
6) 'ರಾಷ್ಟ್ರಕವಿ' ಪ್ರಶಸ್ತಿ ಪಡೆದ ಕವಿ ಯಾರು?
7) ಕುವೆಂಪುರವರ ಯಾವ ಕಾವ್ಯಕ್ಕೆ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿ ಲಭಿಸಿದೆ?
8) ಕಾನೂರು ಹೆಗ್ಗಡತಿ ಕಾದಂಬರಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
9) 'ರಸಋಷಿ' ಎಂದು ಕರೆಯಿಸಿಕೊಂಡ ಕವಿ ಯಾರು?

ಘಟಕ -4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ

1. ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ – ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ

ಪ್ರಶ್ನೆ 1) ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ – ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ ಲೇಖನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಎ.ಎನ್.ಮೂರ್ತಿರಾವ್‌ರ ಪೂರ್ಣ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 3) 'ಚಿತ್ರಗಳು ಪತ್ರಗಳು' ಎಂಬ ಕೃತಿಗೆ ಯಾವ ಪ್ರಶಸ್ತಿ ದೊರೆತಿದೆ?
ಪ್ರಶ್ನೆ 4) 'ಸಂಜೆ ಗಣ್ಣಿನ ಹಿನ್ನೋಟ' ಆತ್ಮಚರಿತ್ರೆ ಕೃತಿ ಬರೆದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 5) 'ಕೃಷ್ಣರಾಜಸಾಗರ ಕಣ್ಣಂಬಾಡಿ ಆಣೆಕಟ್ಟನ್ನು ಕಟ್ಟಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 6) ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಯಾವ ರಾಜ್ಯ ಮನೆತನದಲ್ಲಿ ದಿವಾನರಾಗಿ ಕೆಲಸ ಮಾಡಿದರು?
ಪ್ರಶ್ನೆ 7) ಮೈಸೂರು ದಿವಾನರ ಹುದ್ದೆಗೆ ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ರಾಜಿನಾಮೆ ನೀಡಲು ಕಾರಣವಾದ ವರದಿ
ಪ್ರಶ್ನೆ 8) ಸರ್. ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಹುಟ್ಟೂರು ಯಾವುದು?
ಪ್ರಶ್ನೆ 9) ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಪ್ರಯಾಣ ಹೊರಟ್ಟಿದ್ದಾಗ ಅವರ ಸೂಟ್ಕೇಸನಲ್ಲಿ ಯಾವ ಪುಸ್ತಕ ಇರುತಿತ್ತು?
ಪ್ರಶ್ನೆ 10) ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರಿಗೆ 'ಸರ್' ಪದವಿ ನೀಡಿ ಗೌರವಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 11) ನಾಲ್ವಡಿ ಕೃಷ್ಣರಾಜ ಒಡೆಯರು ನೇಮಿಸಿದ ಆಯೋಗ ಯಾವುದು?
ಪ್ರಶ್ನೆ 12) ಮಂಡ್ಯ ಜಿಲ್ಲೆಯಲ್ಲಿ ಅನ್ನಬ್ರಹ್ಮಣ ಅವತಾರ ಮಾಡಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 13) ಭದ್ರಾವತಿ ಕಬ್ಬಿನ ಮತ್ತು ಉಕ್ಕಿನ ಕಾರ್ಖಾನೆ ನಿರ್ಮಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 14) ಕೈಗಾರೀಕರಣ ಆಗದೆ ಇದ್ದರೆ ಭವಿಷ್ಯದ ಭಾರತಕ್ಕೆ ಮತ್ತು ನಮ್ಮ ನಾಡು ಕರ್ನಾಟಕಕ್ಕೆ ಉಜ್ವಲ ಭವಿಷ್ಯವಿಲ್ಲ ಎಂಬ ಮಾತನ್ನು ಹೇಳಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 15) ಕೈಗಾರಿಕೆಗಳನ್ನು ಬೆಳೆಸದಿದ್ದರೆ ಭಾರತಕ್ಕೆ ಉಳಿಗಾಲವಿಲ್ಲ ಎಂದು ಮನಗಂಡವರು ಯಾರು?
ಪ್ರಶ್ನೆ 16) 'ಭಾರತ ರತ್ನ' ಪ್ರಶಸ್ತಿ ಪಡೆದ ಕನ್ನಡದ ಮೊದಲ ವ್ಯಕ್ತಿ ಯಾರು?

2. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ

ಪ್ರಶ್ನೆ 1) ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ ಲೇಖನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಭಾರತೀಯ ಕರಕುಶಲ ಕಲೆಗಳಿಗೆ ಯಾವ ಕಾಲದಿಂದ ಅಪಾರ ಬೇಡಿಕೆ ಇದೆ?
ಪ್ರಶ್ನೆ 3) ಭಾರತದಿಂದ ರಫ್ತಾಗುತ್ತಿದ್ದ ವಿವಿಧ ಬಗೆಯ ಕರಕುಶಲ ವಸ್ತುಗಳ ಬಗ್ಗೆ ವಿದೇಶಿ ಬರಹಗಳಲ್ಲಿ ಪ್ರಸ್ತಾಪಿಸಿರುವ ಬರಹಗಾರರುಗಳು ಯಾರು?
ಪ್ರಶ್ನೆ 4) ಭಾರತದಲ್ಲಿ ಬೇರೆ ಬೇರೆ ಬಣ್ಣಗಳನ್ನು ನೀಡುವ ಸುಮಾರು ಎಷ್ಟು ಗಿಡಗಳಿವೆ?

ಘಟಕ -5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

1. ಯುಗಾದಿ

ಪ್ರಶ್ನೆ 1) ಯುಗಾದಿ ಕಥೆಯನ್ನು ಬರೆದ ಕಥೆಗಾರರ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 2) ವಸುಧೇಂದ್ರ ಕಥೆಗಾರರು ಎಲ್ಲಿ ಜನಿಸಿದರು?
ಪ್ರಶ್ನೆ 3) ಯುಗಾದಿ ಕಥೆಯಲ್ಲಿಯ ಎರಡು ಮುಖ್ಯ ಪಾತ್ರಗಳು ಯಾವುವು?

ಪ್ರಶ್ನೆ 4) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ಹೆಂಡತಿಯ ಹಸರೇನು?
ಪ್ರಶ್ನೆ 5) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ಸ್ನೇಹಿತನ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 6) ಪ್ರಹ್ಲಾದ ಯಾವ ಕಂಪನಿಯಲ್ಲಿ ಕೆಲಸ ಮಾಡುತ್ತಿದ್ದ?
ಪ್ರಶ್ನೆ 7) ಪ್ರಹ್ಲಾದನ ಪತ್ನಿಯ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 8) 'ರೂಢಿಯನ್ನು ಕಟ್ಟುವುದು ಕಷ್ಟ ; ಮುರಿಯುವುದೂ ಇನ್ನೂ ಕಷ್ಟೆ ; ಮರೆಯುವುದಂತೂ ಇನ್ನೂ ಕಷ್ಟ ! ಈ ಮಾತು ಯಾವ ಕಥೆಯಲ್ಲಿ ಬಂದಿದೆ?
ಪ್ರಶ್ನೆ 9) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ವಿದ್ಯಾರ್ಥಿನಿಯ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 10) ಕಾಸಿಂಸಾಬನ ಮಗ ಯಾರು? ಇಸ್ಮಾಯಿಲ್.

2. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ

ಪ್ರಶ್ನೆ 1) ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ_ಪ್ರವಾಸ ಕಥನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಹಂಪಿ ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಪತಿಯಾಗಿ ಸೇವೆ ಸಲ್ಲಿಸಿದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 3) ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ_ಪ್ರವಾಸ ಕಥನವನ್ನು ಯಾವ ಪ್ರವಾಸ ಕಥನ ಕೃತಿಯಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
ಪ್ರಶ್ನೆ 4) ಜಾನಪದ ಅಕಾಡೆಮಿಯ ಅಧ್ಯಕ್ಷರು ಯಾರು?
ಪ್ರಶ್ನೆ 5) ಸಂಗೀತ ಪುರವು ಈ ಹಿಂದೆ ಯಾರ ಊರಾಗಿತ್ತು?
ಪ್ರಶ್ನೆ 6) ನಾಗವಳ್ಳಿ ಮತ್ತು ಹಾಡುವಳ್ಳಿಗಳ ಸುತ್ತಮುತ್ತಲಿನ ದಟ್ಟ ಕಾಡಿನ ಒಡಲೊಳಗೆ ವಾಸವಾಗಿರುವ ಜನಾಂಗದ ಹೆಸರೆನು?
ಪ್ರಶ್ನೆ 7) ಲೇಖಕರ ಗುಂಪಿನ ಮಾರ್ಗದರ್ಶಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 8) ಮೆಗಾನೆ ಗ್ರಾಮದಲ್ಲಿ ವಾಸವಾಗಿರುವ ಬುಡಕಟ್ಟು ಜನಾಂಗದ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 9) ಕುಣಬಿ ಜನಾಂಗದವರು ಮೂಲತ; ಯಾವ ರಾಜ್ಯದ ಹಿನ್ನೆಲೆಯನ್ನು ಹೊಂದಿದ್ದಾರೆ?

ಪ್ರಶ್ನೆ 10) ಕುಣಬಿ ಜನಾಂಗದವರ ಮುಖ್ಯವಾದ ಹಬ್ಬ ಯಾವುದು?
ಪ್ರಶ್ನೆ 11) ಹಾಡಿಯ (70 ವರ್ಷದ) ಯಜಮಾನ ಯಾರು?
ಪ್ರಶ್ನೆ 12) ತಾಳಗುಪ್ಪದ ಗಿರಿಜನ ಆಶ್ರಮ ಶಾಲೆಯ ಮಾಸ್ತರ ಯಾರು?
ಪ್ರಶ್ನೆ 13) 'ಗೂಬೆ ಕೂರಿಸು' ಪದದ ಅರ್ಥ
ಪ್ರಶ್ನೆ 14) ಹಾಡಳ್ಳಿಗೆ ಹಿಂದೆ ಯಾವ ಹೆಸರಿನಿಂದ ಕರೆಯುತ್ತಿದ್ದರು?

Prepared by Smt.B.S.Koteppagol	6/3/24. 1st year co-ordinator	Principal

Subject Title	Mathematics-II for Electrical & Electronics Engineering Stream		
Subject Code	BMATE201	IA Marks	50
Number of Lecture Hrs / Week	04	Exam Marks	50
Total Number of Lecture Hrs	40	Exam Hours	03
		CREDITS – 04	

FACULTY DETAILS:		
Name: Prof. 1) Dr. S .L Patil 2) Prof. S .A. Patil 3) Prof. S .S Thabaj 4) Prof. I. N. Kambar	**Designation** 1) Asst.Prof. 2) Asst.Prof. 3) Asst.Prof. 4) Asst.Prof	**Experience:** 1) 14.9 years 2) 11 years 3) 11 years 4) 1.6 years
No. of times course taught: 1) 02 (including present) 2) 02 3) 02 4)02	**Specialization:** Mathematics	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	First Year Engineering	I	Calculus and Linear Algebra

2.0 Course Objectives

This course viz., Advanced Calculus and Numerical Methods aims to prepare the students:

- **Familiarize** the importance of Integral calculus and Vector calculus essential for electronics
- **Analyze** electronics and electrical engineering problems by applying Partial Differential Equations.
- **Develop** the knowledge of solving electronics and electrical engineering problems numerically.

3.0 Course Outcomes

Having successfully completed this course, the student will be able to

	Refined Course Outcome	Cognitive Level	POs
C201.1	Understand the applications of vector calculus refer to Solenoidal, irrotational vectors, line integral and surface integral.	L1, L2,L3	1,2,4,12
C201.2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation	L1, L2,L3	1,2,4,12
C201.3	To understand the concept of Laplace transform and to solve initial value problems.	L1, L2,L3	1,2,4,12
C201.4	Apply the knowledge of numerical methods in solving physical and engineering phenomena.	L1, L2,L3	1,2,4,12
C201.5	Get familiarize with modern mathematical tools namely SCILAB/PYTHON/MATLAB	L1, L2,L3	1,2,4,12

4.0 Course Content

Module – 1
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 and problems.

Vector Integration: Line integrals, Surface integrals. Applications to work done by a force and flux. Statement of Green's theorem and Stokes theorem. Problems**.** **(RBTL: L1, L2 and L3) (8 Hours)**

Self-Study: Volume integral and Gauss divergence theorem.
Applications: Conservation of laws, Electrostatics, Analysis of streamlines and electric potentials.

Module – 2
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. **(RBTL: L1, L2 and L3) (8 Hours)**

Self-study: Angles and Projections. Rotation, reflection, contraction and expansion.
Applications: Image processing, AI & ML, Graphs and networks, computer graphics.

Module – 3
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. **(RBTL: L1, L2 and L3) (8 Hours)**

Self-Study: Verification of convolution theorem.
Applications: Signals and systems, Control systems, LR, CR & LCR circuits.

Module –4
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.

(RBTL: L1, L2 and L3) (8 Hours)

Module –5

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 - Taylors series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor corrector formula (No derivations of formulae), Problems. **(RBTL: L1, L2 and L3) (8 Hours)**

Self-Study: Adam-Bashforth method.

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

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	III	Electrical and Electronics Engineering stream	Signals and systems, Control systems, LR, CR & LCR circuits, Electrostatics, Analysis of streamlines and electric potentials, Image processing, AI & ML, Graphs and networks, Computer graphics

6.0 Relevance to Real World

Sl. No	Real World Mapping
01	Vector calculus is used in electromagnetic fields, gravitational fields, and fluid flow. Vector integration is used in Electromagnetic field, Gravitational field, fluid flow.
02	Image processing, AI & ML, Graphs and networks, computer graphics.
03	Laplace transform are used in various areas of physics, electrical engineering, control engineering, optics, mathematics and signal processing. Laplace Transform is widely used by electronic engineers to solve quickly differential equations occurring in the analysis of electronic circuits
04	Estimating the approximate roots, extremum values, Area, volume, and surface area.
05	Numerical Methods are used in all fields of engineering and the physical sciences, life sciences, social sciences, medicine, business and even the arts have adopted elements of scientific computations.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Integrals

8.0 Books Used and Recommended to Students

Text Books
1. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, 44th Ed., 2021.
2. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed. (Reprint), 2018.

Reference Books

1. N.P.Bali and Manish Goyal: A Text Book of Engineering Mathematics, Laxmi Publishers, Latest edition 10th Ed., 2022..
2. B.V.Ramana: "Higher Engineering Mathematics" 11th Edition, Tata McGraw-Hill, 11th Ed, 2017
3. H. K. Dass and Er. RajnishVerma: "Higher Engineerig Mathematics", S. Chand publishing, 3rd edition, 2014.
4. C. Ray Wylie, Louis C. Barrett: "Advanced Engineering Mathematics" , McGraw – Hill
5. **James Stewart: "**Calculus" Cengage publications, 7th edition, 2019.
6. Srimanta Pal & Subobh C Bhunnia: "Engineering Mathematics", Oxford University Press, 3rd Reprint, 2016.
7. Gupta C.B., Singh S.R. and Mukesh Kumar: "Engineering Mathematics for I & II ", McGraw-Hill Education (India) Pvt. Ltd., 2015.
8. **David C Lay:** "Linear Algebra and its Applications", Pearson Publishers, 4th Ed., 2018.
9. **Gareth Williams:** "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6th Ed., 2017.

Additional Study material & e-Books

1.CRC Standard Mathematical Tables and Formulae, 32nd Edition
2.A Student's Guide to the Study, Practice, and Tools of Modern Mathematics- Bindner, Donald
3 .P.N.Wartikar & J.N.Wartikar -Applied Mathematics (Volume I & II) Pune Vidyarthi Griha Prakashan, 7thEdition 1994.
4. Peter V.O'Neil – Advanced Engineering Mathematics, Thomson Brooks/Cole, 7th Edition, 2011.
5. Glyn James – Advanced Modern Engineering Mathematics, Pearson Education, 4th Edition, 2010.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

1. http://nptel.ac.in/courses.php?disciplineID=111
2. http://wwww.khanacademy.org/
3. (MOOCs)
4.http://academicearth.org/
5.VTU EDUSAT Program
6. VTU e-Shikshana Program

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	+ Plus Magazine	https://plus.maths.org/issue44.
2	Mathematics Magazine	www.mathematicsmagazine.com

11.0 Examination Note

Assessment Details (both CIE and SEE)

The weight age 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). 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:

Three Unit Tests each of **20 Marks (duration 01 hour**)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester

5. Second assignment at the end of 9th week of the semester
Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks** (**duration 01 hours**)
6. At the end of the 13th week of the semester
The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**
(to have 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 /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 the subject (**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.
The students have to answer 5 full questions, selecting one full question from each module

12.0 Course Delivery Plan

Module	Lecture No.	Content of Lecturer	% of Portion
1	1	Scalar and vector fields	20
	2	Gradient, directional derivatives	
	3	Curl and divergence-physical interpretation	
	4	Solenoidal and Irrotational vector fields	
	5	Line integrals	
	6	Green Theorem	
	7	Stokes Theorem	
	8	Applications to work done by a force and flux	
2	9	Definition and examples, subspace, linear span	20
	10	Linearly independent and dependent sets	
	11	Basis and dimension	
	12	Linear transformations: Definition and examples	
	13	Algebra of transformations, Matrix of a linear transformation. Change of coordinates	
	14	Rank and nullity of a linear operator	
	15	Rank-Nullity theorem	
	16	Inner product spaces and Orthogonality	
3	17	Existence and Uniqueness of Laplace transform (LT)	20
	18	transform of elementary functions, region of convergence	
	19	Properties–Linearity, Scaling, t-shift property, s-domain shift	
	20	differentiation in the s-domain, division by t, differentiation and integration in the time domain	
	21	LT of special functions periodic functions	
	22	Heaviside Unit step function, Unit impulse function.	
	23	Inverse Laplace Transforms: Definition, properties, evaluation using different methods	
	24	Convolution theorem (without proof), problems, and Applications to solve ODE.	

4	25	Solution of polynomial and transcendental equations	20
	26	Finite differences: Forward & backward differences	
	27	Newton's forward and backward interpolation formulae	
	28	Problems	
	29	Divided differences- Newton's divided difference formula	
	30	Lagrange's interpolation	
	31	Numerical integration: Simpson's one third rule	
	32	Simpson's three eighth rule	
5	33	Numerical solution of ODE of first order & first degree	20
	34	Taylor's series method & Problems.	
	35	Modified Euler's method & Problems	
	36	Problems	
	37	Runge -Kutta method of fourth order & Problems	
	38	Problems	
	39	Milne's predictor and corrector method	
	40	Problems	

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: University Questions	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 1&2 of the syllabus	6	Individual Activity.	Book 1, of the reference list. Website of the Reference list
2	Assignment 2: University Questions	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 3,4 & 5 of the syllabus	11	Individual Activity.	Book 1, 2 of the reference list. Website of the Reference list

14.0 QUESTION BANK

Module-1:

1. Find div F & curl F if F = □ ($x^3 + y^3 + z^3$-3xyz)
2. If $\emptyset = x^2 + y^2 + z^2$ and $\vec{F}=x^2\vec{i}+y^2\vec{j}+z^2\vec{k}$,then find grad$\emptyset$,div$\vec{F}$ and curl $\vec{F}$
3. Find the value of the constants a, b &c such that the vector field,

   $\vec{F} = (x + y + az)i + (bx + 2y - z)j + (x + cy + 2z)k$ is irrotational and hence find a scalar
4. If $u = x^2\hat{i} + y^2\hat{j} + z^2\hat{k}$ & v= yzî + xzĵ +yxk̂ then prove that $\vec{u} \times \vec{v}$ is a Solenoidal vector
5. Prove that $div(\emptyset\vec{A}) = \emptyset(\text{ div } \vec{A}) + \text{ gra } \emptyset \cdot \vec{A}$
6. Prove that curl(grad$\emptyset$) = 0
7. Prove that div curl F=$\nabla . \nabla \times F = 0$
8. If $u = x^2\hat{i} + y^2\hat{j} + z^2\hat{k}$ & v= yzî + xzĵ +yxk̂ then prove that $\vec{u} \times \vec{v}$ is a Solenoidal vector
9. If $\vec{v} = \vec{w} \times \vec{r}$, prove that curl $\vec{v} = 2\vec{w}$ where $\vec{w}$ is a constant vector
10. Verify the Greens theorem $\oint_c$□ $(xy + y^2)dx + x^2dy$ where c is the closed curve of the region bounded by $y = x$ & $y = x^2$
11. Find the area between the parabola $y^2 = 4x$ and $x^2 = 4y$ with the help of Greens theorem in a plane.

12. Verify the Stroke's theorem for the vector function $\vec{F} = 2xyi + (x^2 - y^2)j$ over the circle $x^2 + y^2 = 1$, z = 0
13. Evaluate $\int_c^{\square} xy\,dx + xy^2dy$. by Stroke's theorem where c is the square in x y-plane with (1, 0), (-1, 0), (0,1) & (0, -1)

Module-2:

1. The set w of ordered triads $(a_1, a_2, 0)$, $a_1, a_2 \in F$ is a subspace of $v_3(F)$
2. Prove that the set of all solutions (a, b, c) of the equation $a + b + 2c = 0$ is a subspace of $v_3(R)$
3. Show that the set w of the elements of the vector space $v_3(R)$ of the form $x + 2y, y, x + 3y$: $x, y \in R$ is a subspace of $v_3(R)$
4. Find Null Space, Range, Rank & Nullity of the linear transformation $T: R^2 \to R^3$ defined by $T(x, y) = (x + y, x - y, y)$
5. If $T: R^3 \to R^2$ be a linear transformation defined by $T(x_1, x_2, x_3) = (x_1 - x_2,\ x_1 + x_3)$. Find the rank (T) and Nullity (T).
6. Verify Rank Nullity Theorem for the linear transformation $T: R^3 \to R^3$ defined by $T(x, y, z) = (x - y, 2y + z, x + y + z)$
7. If α and β are orthogonal unit vectors (that is $\{\alpha, \beta\}$ is an orthogonal set), what is the distance α and β
8. Prove that two vectors α and β in a real inner product space are orthogonal iff $\|\alpha + \beta\|^2 = \|\alpha\|^2 + \|\beta\|^2$
9. Two vectors α and β in a complex inner product space are orthogonal iff $\|a\alpha + b\beta\|^2 = \|a\alpha\|^2 + \|b\beta\|^2$ for all pairs of scalar a & b.
10. If α and β are vectors in a real inner product space and if $\|\alpha\| = \|\beta\|$ then $\alpha - \beta$ and $\alpha + \beta$ are orthogonal

Module-3:

1. Find the Laplace Transform of $sin2t\ sin3t$. & $sin^3 2t$.
2. Find $L\ (e^3 t sin2t)$ & $L(e^{4t}\ sin2t\ cost)$.
3. Find $L\left(\frac{1-e^t}{t}\right)$ & $L[\frac{cosat-cosbt}{t}]$
4. Using unit step function find LT of $f(t) = \begin{cases} \sin t, & 0 < t < \pi \\ \sin 2t, & \pi < t < 2\pi \\ \sin 3t, & t > 2\pi \end{cases}$
5. Express $f(t) = \begin{cases} \cos t, & 0 < t < \pi \\ \cos 2t, & \pi < t < 2\pi \\ \cos 3t, & t > 2\pi \end{cases}$ in terms unit step function & hence find LT
6. Evaluate $L[t^2 u(t-3)]$.
7. Find the inverse transform $\frac{s+2}{s^2-4s+13}$.
8. Find $L^{-1}\left(\frac{4s+5}{(s-1)^2(x+2)}\right)$
9. Find $L^{-1}\left(\frac{s}{s^4+4a^4}\right)$
10. Find $L^{-1}\left(\frac{s}{(s^2+a^2)^2}\right)$.
11. Find $L^{-1}\left[\ log\ \frac{(s+1)}{(s-1)}\right]$
12. Find $L^{-1}\left[\frac{s}{(2s-1)(3s-1)}\right]$
13. Using the Convolution THM obtain the $L^{-1}\left[\frac{s}{(s^2+a^2)^2}\right]$.
14. Solve the differential equation $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3t}$ with $y(0) = 0 = y'(0)$, using LT
15. Solve the differential equation $y'' + 4y' + 3y = e^{-t}, y(0) = 1 = y'(0)$. Using LT

Module-4:

1. Find the real root of the equation $xlog_{10}x$ =1.2 by Regula-Falsi method correct to four decimal places.
2. Find by Newton's method, the real root of the equation 3x = cosx +1.
3. Using the Newton's Raphson method, find a root of the following equations correct to the three decimal
4. Places. i) 3sin x – 2x+5 = 0 near 3, ii) x sin x + cos x = 0 which is near x = π

5. Find by Newton's method, the root of the equation cos x = x e^x.
6. Use Newton-Raphson method to find a real root of the equation $\log x - \cos x = 0$
7. By applying Weddle's Rule evaluate $\int_0^1 \frac{x}{1+x^2} dx$ by considering 7 ordinates. Hence find the value of $log_e 2$
8. Evaluate $\int_0^1 \frac{1}{1+x} dx$, by using Simpson 1/3 rd rule, considering seven ordinates. Hence deduce the value of $log_e 2$.
9. Find the interpolating formula that approximates to the function described by the following table

x	0	1	2	5
y	2	3	12	147

10. Find 'y' when x= 0.26 using appropriate interpolation formula to the following data,

X	0.10	0.15	0.20	0.25	0.30
Y	0.1003	0.1511	0.2027	0.2553	0.3093

11. If y(5)=150 , y(7)=392 , y(11)=1492 , y(13)=2366 ,y(17) = 5202 then find y(9) by using Lagrange's Formula
12. Apply Lagrange's Inverse interpolation formula to find a root of the equation f(x)=0 given that
    $f(30) = -30,\ f(34) = -13,\ f(38) = 3,\ f(42) = 18.$
13. Use Newton's divided difference formula to find f(4) given

x	0	2	3	6
y	- 4	2	14	158

14. The following table gives the distances in nautical miles of the visible horizon for the given heights in feet above the earth's surface

x:height	100	150	200	250	300	350	400
y:distance	10.63	13.03	15.04	16.81	18.42	19.90	21.27

Find the values of y when x=218 feet and 410 feet

15. From the following table, estimate the number of students who obtained marks between 40 & 45

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

16. In the table below the value of y are conjugative terms of a series of which 23.6 are the 6^{th} term. Find
    The first & tenth terms of the series

x	3	4	5	6	7	8	9
y	4.8	8.7	14.5	23.6	36.2	52.8	73.9

17. Given the values

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Find f(15) and f(19)

18. Use Newton's divided difference formula to find f(x) given the data

x	0	2	3	6
f(x)	-4	2	14	158

19. Given the values

x	5	7	11	13	17
f(x)	150	392	1452	2366	5202

Evaluate f (9) using divided difference formula for unequal intervals.

20. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's 1/3 rd rule taking four equal strips
21. If y(1) =3,y(3) = 9, (4) = 30,y(6) =132, Find Lagrange's interpolation formula & hence find y at x=5.

22. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using

i) Simpson's 1/3 rd rule , ii) Simpson's 3/8th rule, iii) Weddle's rule compare with its actual value.

23. Use Simpson's 1/3 rd rule to find $\int_0^{0.6} e^{-x^2} dx$ by taking seven ordinates.

24. Using Simpson's 3/8th rule , evaluate $\int_0^{0.3} \sqrt{1-8x^3}\, dx$ by taking 7 ordinates.

25. Integrate numerically $\int_0^{\frac{\pi}{2}} \sqrt{cos\theta}\, d\theta$

Module-5:

1. Solve $\frac{dy}{dx} = x^2y - 1$with $y(0) = 1$ using Taylor's series method and find $y(0.1)$ consider up to 4th degree terms.
2. Use Runge Kutta fourth order method to solve $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$ with $y(0) = 1$ and find y for $x =$ 0.2 and 0.4 take $h = 0.2$.
3. Given$\frac{dy}{dx} = xy + y^2$,$y(0) = 1, y(0.1) = 1.1169$, $y(0.2) = 1.2773, y(0.3) = 1.5049$ $find$ $y(0.4)$ accurate up to three decimal places using Milne's predictor corrector method.
4. Applying R-K method to find an approximate value of y for x=0.2 in steps of 0.1 of $\frac{dy}{dx} = x + y^2$ given that $y = 1$ when $x = 0$.
5. Given $\frac{dy}{dx} = x^2(1+y)$ & $y(1) = 1, y(1.1) = 1.233, y(1.2) = 1.548, y(1.3) = 1.979$. Evaluate $y(1.4)$ by Adams Bash Fourth method
6. Employ Taylor's series method to find an approximate solution correct to fourth decimal places for the following initial value problem at x=0.1 & 0.2 $\frac{dy}{dx} = 2y + 3e^x$, $y(0) = 0$.
7. Using Milne's predictor corrector method find y where $x = 0.8$ given $\frac{dy}{dx} = x - y^2$, $y(0) = 0$, $y(0.2) = 0.02, y(0.4) = 0.0795, y(0.6) = 0.1762$.Applying corrector formula twice.
8. Employ R-K method of 4rth order to solve the equation$\frac{dy}{dx} = 3x + y/2, y(0) = 1$ at $x = 0.2$ taking step length$h = 0.1$.
9. Solve the differential equation $\frac{dy}{dx} = x^2 + y^2$ given $y(0) = 1$ to find the value of $y(0.1)$ by using Taylor's series method of order.
10. Using modified Euler's method ,solve the equation $\frac{dy}{dx} = \frac{1}{x+y}$, $y(0) = 1$ in steps of 0.5 at $x = 1$
11. Using Taylor's series method to find y at the point $x = 0.1$ & $x = 0.2$ given that $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 1$
12. From the data given below find y at $x = 1.4$ using Milne's predictor corrector method $y' = \frac{x^2+y}{2}$

x	1	1.1	1.2	1.3
y	2	2.2156	2.4649	2.7514

Prepared by	Checked by		
Dr. S. L. Patil Prof. S. S. Thabaj Prof. I. N. Kambar	Dr. S. L. Patil	HOD	Principal

Course Title	Mathematics-II for Electrical & Electronics		
Course **Code**	BMATE201	**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**	**04**
Total Hours of Pedagogy	40 hours Theory + 10 to12 Lab slots	**Credits**	**04**

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 predictor-corrector \ method

Subject Title	**Chemistry for Electrical and Electronics Engineering stream**		
Subject Code	**BCHEE202**	**CIE Marks**	50
		SEE Marks	50
Number of Lecture Hrs / Week	2+2+2	**Total Marks**	100
Total Number of Lecture Hrs	40 hours Theory + 10 to12 Lab slots	**Exam Hours**	03+02
		CREDITS – 04	

FACULTY DETAILS:		
Name: 1) Dr. M. S. Hanagadakar 2) Dr. S. J. Walki 3) Dr. Tanuja S.B.	**Designation:** 1) Associate Prof. 2) Assistant Prof. 3) Assistant Prof.	**Experience:** 1) 16.5 Years 2) 7.5 Years 3) 6.5 Years
No. of times course taught: 1) 23 (including Present) 2) 15 (including Present) 3) 02 (including Present)	**Specialization:** 1) Physical Chemistry 2) Organic Chemistry 3) Physical Chemistry	

1.0 Prerequisite Subjects:

Students should have the basic knowledge chemistry and Basic Science.

Sl. No	Branch	Semester	Subject
01	EEE	II	Chemistry for Electrical and Electronics Engineering stream

2.0 Course Objectives

To provide students with knowledge of engineering chemistry for building technical competence in industries, research and development in the following fields

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

3.0 Course Outcomes

On completion of this course, students will have knowledge in:

	Course Outcome	**POs**	**RBT Levels**
CO1	Identify the terms and processes involved in scientific and engineering applications	1,2,3, & 7	L3
CO2	Explain the phenomena of chemistry to describe the methods of engineering processes	1,2,3, & 7	L1 &L2
CO3	Solve for the problems in chemistry that are pertinent in engineering applications	1,2,3, & 7	L3
CO4	Apply the basic concepts of chemistry to explain the chemical properties and processes	1,2,3, & 7	L3
CO5	Analyze properties and processes associated with chemical substances in multidisciplinary situations	1,2,3, & 7	L1&L2
Total Hours of instruction		**100**	

4.0 Course Content

MODULE 1: Chemistry of Electronic Materials

Conductors and Insulators: Introduction, principle with examples.

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

Polymers: Introduction, Molecular weight - Number average, Weight average and numerical problems. Conducting polymers – synthesis and conducting mechanism of polyacetylene. Preparation, properties and commercial applications of graphene oxide. PCB: Electroless plating – Introduction, Electroless plating of copper in the manufacture of double-sided PCB.

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

MODULE 2: Energy Conversion and Storage

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

Fuel Cells: Introduction, construction, working and applications of methanol–oxygen and polymer electrolyte membrane (PEM) fuel cell.

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

Self-learning: Electrodes for electrostatic double layer capacitors, pseudo capacitors, and hybrid capacitor.

MODULE 3: Corrosion Science and E-waste Management

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

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

Self-learning: Recycling of PCB and battery components

MODULE 4: Nanomaterials and Display Systems

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

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

Perovskite Materials: Introduction, properties and applications in optoelectronic devices

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

MODULE 5: Sensors in Analytical Techniques

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

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

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

Self-learning: IR and UV- Visible spectroscopy.

PRACTICAL MODULE

A– Demonstration (any two) offline/virtual:

A1. Synthesis of polyurethane
A2. Determination of strength of an acid in Pb-acid battery
A3. Synthesis of iron oxide nanoparticles
A4. Electroplating of copper on metallic objects

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

B1.Conductometric estimation of acid mixture
B2. Potentiometric estimation of FAS using K2Cr2O7
B3. Determination of pKa of vinegar using pH sensor (Glass electrode)
B4. Determination of rate of corrosion of mild steel by weight loss method
B5.Estimation of total hardness of water by EDTA method

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

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

D – Open Ended Experiments (any two):

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

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	II	Nano technology, Water chemistry, Civil. ECE/EEE,/ME,Corrosion study, (Common to all Engineering subjects)	Introduction to fundamental aspects of chemistry and Engineering chemistry in I/II semester Students will learn the laboratory and practical techniques needed for the later years of the course. Students have to choose and elective paper on applied chemistry as well.

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Generate electricity in the most efficient fashion to preserve our natural resources and protect the environment.
02	Improve mining techniques, so they minimize environmental damage and cost less.
03	Manufacture petrochemicals, making them cheaper and safe for people to use Create renewable fuels and energy sources to replace coal, petrol and gas. Refine oil into petrol, keeping petrol prices low and improving petrol quality so it doesn't pollute the air.
04	Produce safe drinking water from rivers, groundwater or the sea for city, rural and remote aboriginal communities.
05	Safely treat toxic hazardous industrial wastes so their disposal does not harm the environment
06	Nanotechnology (an emerging scientific area utilizing very small particles for diverse applications)
07	Semi-conductors & microelectronics (many chemical engineers work in these areas)

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Numerical problems discussion
02	NPTEL	Each module/ Chapter presentation

8.0 Books Used and Recommended to Students

Text Books

1. B. S. Jai Prakash, R. Venigopal, Shivakumarraiah, PushpaIyengar, Chemistry for Engineering Students, Subhas Stores (Bangalore), 2014
2. R. V. Gadag and A. N. Shetty, Engineering Chemistry, IK International Publishing House, New Delhi, Third Edition 2014
3. P.C. Jain & Monica Jain. **"Engineering Chemistry"**, DhanpatRai Publications, New Delhi (2015 Edition).
4. S. S. Dara, A textbook of Engineering Chemistry, 10th Edition, S Chand & Co., Ltd., New Delhi, 2014.
5. Physical Chemistry, by P. W. Atkins, Oxford Publications (Eighth edition-2006).

Reference Books

1. O.G.Palanna,"Engineering Chemistry",Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint.
2. G.A.Ozin& A.C. Arsenault, "NanochemistryA Chemical Approach to Nanomaterials", RSC publishing, 2005.
3. V. R. Gawariker, N V. Viswanathan, JayadevSreedhar, Polymer Science, New Age International (P) Ltd., New Delhi, 2nd edition 2015.
4. M.G.Fontana., "Corrosion Engineering", Tata McGraw Hill Publishing Pvt. Ltd. New Delhi.
5. Engineering Chemistry by S.S Dara, S.S Umare., S. Chand & Co. Pvt Ltd. New Delhi.
6. Engineering Chemistry by P.R.Vijayasarathy, Second Edition, PHI Learning Pvt. Ltd. New Delhi.
7. Puri B R Sharma L R and Madan S Pathania, Principles of Physical Chemistry, Vishal publishing Co., Edition 2004
8. ArunBahl, B. S. Bahl, A Text Book of Organic Chemistry, S Chand and Co. Ltd., First Edition 2005
9. Michael F. Ashby, Paulo J. Ferreira, Daniel L. Schodek, Nano Materials, Nanotechnologies and Design, Elsevier India Pvt. Ltd., 2011.
10. T Pradeep, NANO: The Essentials, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012, 7th Reprint
11. Fred W. Billmeyer, Text Book of Polymer Science, Wiley India (P) Ltd., Third Edition 2011

Additional Study material & e-Books

1. Introduction to Chemistry - Tracy Poulsen; 250 pages; ISBN-13: 9781478298601; ISBN-10: 147829860X
2. Elementary Applied Chemistry * - Lewis BenajahAllyn; 152 pages; Publisher: Ginn and Company 1912; ISBN/ASIN: 1112247610.
3. Kuriocose, J C and Rajaram, J, Engineering Chemistry, Volume I/II, Tata McGraw- Hill Publishing Co. Ltd.New Delhi, 2000

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

1.http://www.mooc-list.com/course/chemistry-minor-saylororg
2. https://www.canvas.net/courses/exploring-chemistry
3. http://nptel.ac.in/courses/122101001/
4.http://www.nptelvideos.in/2012/11/engineering-chemistry-1.html

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	International Journal of Engineering Science	https://www.journals.elsevier.com/international-journal-of-engineering-science
2	International Journal of Engineering Trends and Technology	http://ijettjournal.org/
3	Nanotechnology, Science and Applications	https://www.dovepress.com/nanotechnology-science-and-applications-journal

11.0 Examination Note

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 20 Marks (duration 01 hour)

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

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

Two assignments each of 10 Marks

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

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

CIE for the practical component of the Integrated Course

1. 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. common/repeated for any of the methods of the CIE. Each method of CIE should have a different
2. 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**.
3. The laboratory test **(duration 02/03 hours)** at the end of the 14th /15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and **scaled down to 05 marks.**
4. Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **20 marks**.

Semester End Examination (SEE): 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).

SCHEME OF EXTERNAL EXAMINATION:

Ten main questions to be set in question paper. Each main question will carry 16 marks. Student has to answer either 1 or 2 main question. It will continue up to 10th question.

Module I– Question 1(a,b,c) or 2(a,b,c) = 20Marks
Module II – Question 3(a,b,c) or 4(a,b,c) = 20Marks
Module III– Question 5(a,b,c) or 6(a,b,c) = 20Marks
Module IV – Question 7(a,b,c) or 8(a,b,c) = 20Marks
ModuleV – Question 9(a,b,c) or 10(a,b,c) = 20Marks
Total = 100Marks

INSTRUCTION FOR ENGINEERING CHEMISTRY (22CHEE12/22) EXAMINATION

1. The total exam duration is 3 hours.
2. Use black ink pen for writing examination
3. Drawing should be drawn from dark pencil.
4. Read the questions carefully.
5. Answer the questions up to the point.

Passing standard:

1. 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.
2. 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.

12.0 Course Delivery Plan

Module No.	Lecture No.	Content of Lecture	% of Portion
1	1	Conductors and Insulators: Definition of conductors, semiconductor and insulators based on band theory, principle with examples taking Cu, Si **and Quartz or any suitable example.**	20.0
	2	Semiconductors: Introduction, production of electronic grade silicon from quartz	
	3	i) Czochralski process (CZ) and ii) Float Zone (FZ) methods	
	4	Polymers: Importance and developments in the field of olymers, Definition of number and weight average molecular mass, Formulae there in.	
	5	Numerical problems on Number average and Weight average molecular mass	
	6	PCB: Electroless plating – Introduction, Electroless plating of Copper in	

		the manufacture of double-sided PCB.	
	7	Conducting polymers – synthesis of polyacetylene, Conducting mechanism of polyacetylene (explanation interms of either p or n-doping) steps involved include polaron, bipolaron and soliton pair simpleaddition technique, zeigler Nutta catalyst).	
	8	Graphene Oxide: Preparation(hummers method), properties and commercial applications (any 4 each).	
2	1	Batteries: Introduction, classification of batteries as primary, secondary **and reserve batteries with examples**	**20.0**
	2,3,4	Components, construction, working and applications of modern batteries; **Na-ion battery i)solid state battery (Li-polymer battery) and iii) flow battery (Vanadium redox flow battery)**	
	6	Fuel Cells: Introduction, construction, working and applications of **methanol–oxygen**	
	7	**polymer electrolyte membrane (PEM) fuel cell**	
	8	Solar Energy: Introduction, importance of solar PV cell, Construction and working of solar PV cell, advantages and disadvantages.	
3	1	**Corrosion Chemistry:** Introduction (ill effects, global losses, technological importance), electrochemical theory of corrosion (principle, reactions under different conditions anddiagram taking iron as an example)	**20.0**
	2	Types of corrosion- differential metal ((Definition, Principle, Process and application)	
	3	Differential aeration (principle, explanation with examples), Corrosion control – ((Definition, Principle, Process and application)galvanization,	
	4	Anodization and sacrificial anode method	
	5	Corrosion Penetration Rate (CPR) (Definition and formula) - Introduction and numerical problems (at least 4)	
	6	E-waste Management: Introduction (ill effects of e-waste management, global losses, environmental importance), sources, types, effects of e-waste on environment and human health	
	7	Methods of disposal(Classification) , advantages of recycling	
	8	Extraction of copper and gold from e-waste(Principle, process, taking PCB as an example)	
4	1	Nanomaterials: Introduction, size dependent properties of nanomaterials(Surface area, Catalytic, Conducting)	**20.0**
	2	Preparation of nanomaterials by sol-gel and co-precipitation method with example.	
	3	Introduction, properties and applications - Nanofibers, Nanophotonics, Nanosensors.	
	4	Display Systems: Liquid crystals (LC's) - Introduction, classification, properties	

	5	Application in Liquid Crystal Displays (LCD's).	
	6	Properties and application of Organic Light Emitting Diodes (OLED's)	
	7	Properties and application of Quantum Light emitting diodes (QLED's).	
	8	Perovskite Materials: Introduction, properties and applications in **optoelectronic devices (solar cells).**	
5	1	Electrode System: Introduction, types of electrodes	**20.0**
	2	Ion selective electrode – definition, construction, working and applications of glass electrode. Determination of pH using glass electrode	
	3	Reference electrode - Introduction, calomel electrode – construction, working and applications of calomel lectrode	
	4	Concentration cell – Definition, construction and Numerical problems	
	5	Sensors: Introduction, general working principle (schematic diagram and explanation) and applications of conductometric sensors	
	6	Introduction, brief working principle and applications electrochemical sensors, Thermometric sensors, and Optical sensors.(No instrumentation)	
	7	Analytical Techniques: Introduction, principle and instrumentation of Colorimetric sensors; application in estimation of the Copper	
	8	Potentiometric sensors; (definition and Principle Instrumentation and working application in estimation of Iron) conductometric sensors; (definition and Principle Instrumentation andworking application its application in the estimation of weak acid.	

13.0 QUESTION BANK

Module-I Chemistry of Electronic Materials

1) What are conductors and insulators? Explain the principle involved in conductors and insulators by taking an examples.
2) Mention the differences between conductors, semiconductors and insulators.
3) What are semiconductors? Explain the production of electronic grade silicon by Czochralski (CZ) process.
4) Explain the production of electronic grade silicon by Float Zone (FZ) method.
5) What are conducting polymers? Explain the synthesis and conducting mechanism of polyacetylene. Mention its commerci applications.
6) Explain the preparation, properties and commercial applications of graphene oxide.
7) Define electroless plating. Describe the electroless plating of copper in the manufacture of double-sided PCB.

MODULE 2: Energy Conversion and Storage

1) Define batteries. Explain the construction, working and applications of Na-ion battery.
2) Explain the components in the battery.
3) Describe construction, working and applications of Li-polymer solid state battery.
4) Explain construction, working and applications of Vanadium redox flow battery.
5) Define fuel cells. Explain the construction, working and applications of Methanol-oxygen fuel cell.
6) Explain the construction, working and applications of polymer electrolyte membrane (PEM) fuel cell.
7) What are photovoltaic cells? Explain the construction and working of solar photovoltaic cell. Mention their advantages and disadvantages.

MODULE 3: Corrosion Science and E-waste Management

1) Define Metallic corrosion. Explain the electrochemical theory of corrosion.

2) Define differential metal corrosion and differential aeration corrosion.
3) Explain the corrosion taking place when two different metals are in contact with each other.
4) Explain the water line and pitting corrosion.
5) Define the galvanization. Explain the steps involved galvanizing.
6) Define anodization. Explain anodizing of Aluminium.
7) Define corrosion penetration rate (CPR).
8) Define E-waste. Explain the sources and types of e-waste.
9) Describe the effects of e-waste on environment and human health.
10) Explain the methods of disposal of e-waste.
11) Write a note on the advantages of recycling.
12) Explain the extraction of copper and gold from e-waste.

MODULE 4: Nanomaterials and Display Systems

1) What are nanomaterials ? Explain the size dependent properties of nanomaterials.
2) Explain the preparation of nanomaterials by sol-gel method with example.
3) Explain the preparation of nanomaterials by co-precipitation method with example.
4) Write a note on properties and applications of nanofibres.
5) Explain the properties and applications of nanophotonics and nanosensors.
6) What are liquid crystals? Explain the classification of liquid crystals.
7) Describe the properties of Liquid crystals and application in LCD's.
8) Explain the properties and applications of organic light emitting diodes (OLED's).
9) Explain the properties and applications of Quantum light emitting diodes (QLED's).
10) What are perovskite materials? Explain the properties and applications in optoelectronic devices.

MODULE 5: Sensors in Analytical Techniques

1) Explain the types of electrodes.
2) Define Ion selective electrode. Explain the construction, working and applications of glass electrode.
3) Explain the determination of pH using glass electrode.
4) Define reference electrode. Explain the construction, working and applications of calomel electrode.
5) Define concentration cells. Explain construction of concentration cells.
6) Numerical problems on Concentration cell.
7) Explain the working principle and applications of Conductometric sensors.
8) Explain the working principle and applications of electrochemical sensors.
9) Describe the working principle and applications of Thermometric sensors.
10) Describe the working principle and applications of optical sensors.
11) Explain the principle and instrumentation of colorimetric sensors and applications in the estimation of copper.
12) Explain the principle and instrumentation of potentiometric sensors and its applications in the estimation of iron.
13) Explain the principle and instrumentation of conductometric sensors and its applications in the estimation of weak acid.

14.0 University Result

Examination	S	A	B	C	D	E	% Passing

Prepared by	Checked by		
Prepared by 1) **Dr. M. S. Hanagadakar** 2) **Dr. S. J. Walki** 3) **Dr. Tanuja S.B.**	**HOD**(Chemistry) **(Dr. M. S. Hanagadakar)**	**HOD**	**Principal**

Subject Title	**Computer Aided Engineering Drawing**		
Course Code	**22CAED203**	**CIE Marks**	50
Number of Lecture Hrs / Week	2:0:2:0	**SEE Marks**	50
Total Number of Lecture Hrs	40	**Exam Hours**	03
Credits	03		

FACULTY DETAILS:		
Name: **Prof. D.N. INAMDAR**	**Designation:** Asst .Professor	**Experience:**21Years
No. of times course taught:15	**Specialization:** Tool Design	

FACULTY DETAILS:		
Name: Prof. GIRISH M. ZULAPI	**Designation:** Asst .Professor	**Experience:** 15 Years
No. of times course taught: 04	**Specialization:** Product Design and Manufacturing	

FACULTY DETAILS:		
Name: **Prof. P.M. KOKITAKAR**	**Designation:** Asst .Professor	**Experience:**05Years
No. of times course taught:00	**Specialization:** Machine Design	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	High School	8, 9,10th Std.	Geometry
02	PU Science	I and II year	Trigonometry, Mathematical Curves and Analytical Geometry.

2.0 Course 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 visualise engineering components

3.0 Course Outcomes

Having successfully completed this course, the student will be able to draw and use modeling software's to generate

	Course Outcome	Cognitive Level	Pos
CO1	Draw and communicate the objects with definite shape and dimensions	U	PO1, PO5,
CO2	Recognize and Draw the shape and size of objects through different views	U	PO1, PO5,
CO3	Develop the lateral surfaces of the object	U	PO1, PO5,
CO4	Create a 3D views using CAD software.	U	PO1, PO5,

CO5	Identify the interdisciplinary engineering components or systems through its graphical representation.	U	PO1, PO5,
Total Hours of instruction		**40**	

4.0 Course Content

MODULE-1

Introduction: ***for CIE only***

Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales.

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

Orthographic Projections of Points, Lines and Planes:

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

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

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

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

MODULE-2

Orthographic Projection of Solids:

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

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

MODULE – 3

Isometric Projections:

Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones andspheres. 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 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 andrectangular 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 todimensions etc

Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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.

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	III	Computer aided Machine Drawing	Modeling and Assembly drawing of Machine Parts
02	V/VI	Design of Machine Elements I/II	Fasteners, Keys and Joints, Rivets and Assembly drawings.
03	VIII	Project work	Part Modeling and its detailed drawings,

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Industrial drawings and design of various components in all engineering disciplines including Mechincal Engg.
02	Model creation for Stress and thermal analysis of parts modeled
03	May be contribute as Developer of a software applications in industrial mechanical engineering needs.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Lettering, Line, Methods of dimensioning, Animated videos, online discussion on the topics as and when required to students.
02	NPTEL	Videos of machine Assembly drawings and drawing standards

8.0 Books Used and Recommended to Students

Text Books

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

Reference Books

- *Bhattacharya S. K.*, Electrical Engineering Drawing, New Age International publishers, second edition 1998, 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*, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.
- *K. R. Gopalakrishna, & Sudhir Gopalakrishna*: Textbook Of Computer Aided Engineering Drawing, 39thEdition, Subash Stores, Bangalore,2017

Additional Study material & e-Books

COMPUTER AIDED ENGINEERING DRAWING BY N.H.Ramaiah and Rajshekar. NEW AGE International publication 2008-09

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
1) https://hareeshang.wordpress.com/tutorials/caed/
2) http://m.noteboy.in/vtuflies/machine%20drawing.pdf
3) https://www.edx.org/school/iitbombayx?utm_source=bing&utm_medium=cpc&utm_term=iit-bombay&utm_campaign=partner-iit-bombay
4) http://www.vlab.co.in/

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	Journal of Aircraft	http://arc.aiaa.org/loi/ja
2	International Journal of Solids and Structures	http://www.sciencedirect.com/science/journal/00207683
3	Journal of Manufacturing Science and Engineering	http://manufacturingscience.asmedigitalcollection.asme.org/issue.aspx?journalid=125&issueid=27340
4	American Fastener Journal	http://www.fastenerjournal.com/

11.0 Examination Note

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 mark 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 total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation (CIE)

- CIE shall be evaluated for max marks 100. Marks obtained shall be accounted for CIE final marks, reducing itby 50%.
- CIE component should comprise of Continuous evaluation of Drawing work of students as and when the Modules are covered on the basis of belowdetailed weightage.

Module	Max. Marks Weightage	Evaluation Weightage in marks	
		Computer display and print out (a)	Preparatory 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
Total	**100**	**80**	**20**
Consideration of Class work		**Total of [(a) + (b)] = 100 Scale down to 30 marks**	

- 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 **20Mark**s.
- 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 by50%
- 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 theexaminers.
- Scheme of Evaluation: *To be defined by the examiners jointly and the same shall be submitted to the university along with questionpaper.*

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 withoutsketch.*

Module	**Max. MarksWeightage**	**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
Total	**100**	**80**	**20**
Consideration of SEE Marks	**Total of (a) + (b) ÷ 2 = Final SEE marks**		

12.0 Course Delivery Plan

Module No.	Lecture No.	Content of Lecture	Teaching Method	Laboratory Component	%of Portion
I	1	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	**Chalk & Talk**	**Power Point Presentation & Demo using solid edge drafting software of one illustrative example**	**20**
	2	**Orthographic Projections of Points, Lines and Planes:** **Orthographic Projections of Points:** Introduction to Orthographic projections Orthographic projections of points in 1st and 3rd quadrants.			
	3	**Problems on projection of points.**			
	4	**Orthographic Projections of Lines :** Problems on Orthographic projections of lines. (Placed in First quadrant only).			
	5	Problems on Orthographic projections of lines. (Placed in First quadrant only).			
	6	**Orthographic Projections of Planes:** Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon and circular laminae. (Placed in First quadrant only using change of position method).			
	7	Orthographic projections of planes viz rectangle, pentagon			
	8	Orthographic projections of planes viz hexagon and circular laminae.			
II	9	**Orthographic Projections of solids:**	**Chalk**	**Lab session**	

		Introduction, definitions Orthographic projection of right regular solids **(Solids Resting on HP only):** Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes, &Tetrahedron.	**& Talk**	**on sketching and computer aided drafting on projection of solids.**	
	10	Position of solids with reference to planes of projections considering its base, face, axis, base edge, face edge, base corner etc.			
	11	Tips to draw projection of solids with an example with change of position of method			
	12	Projection of triangular, square and rectangular pyramids-variety of problems will be solved			**20**
	13	Projection of pentagonal, hexagonal pyramids – variety of problems will be solved.			
	14	Lab session on sketching and computer aided drafting on projection of solids on triangular, square, pentagonal and hexagonal pyramids			
	15	Problems on Projection of cones and cylinders			
	16	Problems on projection of prisms – square, pentagonal, hexagonal prisms			
	17	Projections of Frustum of cone, pyramid & truncated sphere (For CIE only).			
	18	Solution of problems from VTU question papers			
III	19	**Isometric Projections :** Introduction, Isometric scale, Isometric projection of simple plane figures,	**Chalk & Talk**	**PowerPoint Presentation & Demo using solid edge drafting software of one illustrative example**	**20**
	20	Isometric projection of hexahedron(cube), right regular prisms,			
	21	Isometric projection of pyramids, cylinders			
	22	Isometric projection of cones, spheres			
	23	Isometric projection of combination of two simple solids			
	24	Conversion of given Isometric/ pictorial views to orthographic views of simple objects.			
	25	**Introduction to Conversion of simple isometric drawings into orthographic views.** Illustrative example on it.			
	26	Two simple Problems on applications of Isometric projections of simple objects / engineering components.			
IV	27	**Development of Lateral Surfaces of Solids:** Introduction to section planes and sectional views.	**Chalk & Talk**	**PowerPoint Presentation & Demo using solid edge drafting software of one illustrative**	**20**
	28	Development of lateral surfaces of right regular prisms,			
	29	Development of lateral surfaces of right cylinders, pyramids,			
	30	Development of lateral surfaces of cones resting with base on HP only.			
	31	Development of their frustums and truncations.			

	32	Problems on applications of development of lateral surfaces like, funnels and trays.		**example**	
	33	Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct.			
V	33	Multidisciplinary Applications & Practice (For CIE Only): Free hand Sketching; True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc		**PowerPoint Presentation & Demo using You tube tutorials/Relevant modeling drafting softwares**	**20**
	34	Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains,			
	35	Ratchets, two wheeler cart & Four wheeler carts to dimensions etc			
	36	Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic power distribution system uses suitable software			
	37	Electronics Engineering Drawings- Like, Simple Electronics Circuit Drawings.			
	38	Basic Building Drawing; Like, Architectural floor plan, basic foundation drawing,			
	39	steel structures- Frames, bridges, trusses using Auto CAD or suitable software			
	40	Graphs & Charts: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.			

13.0 Assignments, Pop Quiz, Mini Project, Seminars

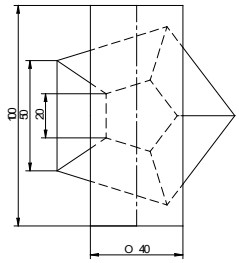
Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: University Questions on Projection of Points	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	2	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
2	Assignment 2: University Questions on Projection of lines	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	4	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
3	Assignment 3: University Questions on PROJECTION OF PLANES .	Students study the Topics and write the Answers. Get practice to solve university questions.	Module I of the syllabus	6	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference

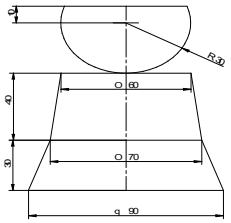
						list
4	Assignment 4: University Questions on PROJECTION OF SOLIDS	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 2 of the syllabus	10	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
5	Assignment 5: University Questions on Isometric Projections	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 3 of the syllabus	14	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
6	Assignment 6: University Questions on PROJECTIONS ON Developments	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 4 of the syllabus	12	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, of the reference list. Website of the Reference list
7	Assignment 7: Multidisciplinary Applications & Practice :	Students understand application of engineering drawing in all engineering streams with one illustrative example.	Module 5 of the syllabus	15	Individual Activity. Drawn & Printed solution expected.	Book 1 & 2, and tutorial websites of the reference list.

14.0 Assignment Questions

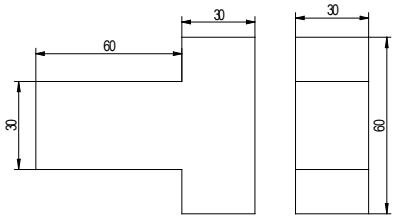
Assignment No	Questions	Marks
I	1. Draw the projection of the following points on the same XY line, keeping convenient distance between each projector. Name the Quadrants in which they lie. a. A - 30 mm above HP & 35 mm in front of VP. b. B - 35 mm above HP & 40 mm behind VP. c. C - 40 mm above HP & on VP. d. D - 35 mm below HP & 30mm in front of VP. 2. A point G is 25mm below HP & situated in the third quadrant its shortest distance from XY line is 45 mm. Draw its projections and find its distance from VP. 3. A point S is in the first quadrant and equidistance of 50 mm from all the three principle planes Draw the projection of the point. Draw all the three views of the point. 4. A point P is 30mm in front of VP, 40mm above HP and 50mm from RPP. Draw its projections. 5. A point is 35mm below HP, 20mm behind VP and 25mm behind/in front/ from RPP. Draw its projections and name the side view. 6. A point is 35mm below HP, 15mm behind VP & 25mm behind/in front/from RPP. Draw the projection and name the side view.	15 15 15 15 15 15 15
II	1. A line AB has its end A 20 mm above the HP and 30 mm in front of the VP. The other end B is 60 mm above the HP and 45mm in front of VP. The distance	

	between end projectors is 70 mm. Draw its projections. Determine the true length and apparent inclinations.	15
	2. The top view pq of a straight line is 70 mm and makes an angle of 60 with XY line. The end Q is 10 mm infront of VP and 30 mm above the HP. The difference between the distances of P and Q above the HP is 45 mm. Draw the projections. Determine its true length and true inclinations with HP and VP.	15
	3. A line has its end A 10 mm above Hp and 15 mm infront of VP. The end B is 55 mm above HP and line is inclined at 30 to HP and 35 to VP. The distance between the end projectors is 50 mm. Draw the projections of the line. Determine the true length of the line and its inclinations with VP.	15
	4. A straight line PQ inclined at 40° to VP has pq = 60mmand p'q'=50mm. The end P is both in HP and VP, and 40 mm to the right of left profile plane. a) Draw the projections of the straight line PQ b) Draw the true length and true inclination with HP. c) Draw the profile view of the straight line. d) Find the position of the end Q with HP and VP.	15
	5. Draw the projections of line PQ and find the true length and inclinations when the line is inclined at 30° to the HP and 45° to the VP. The line is having one of its end 15mm above HP and 20mm in front of VP. The distance between the end projectors on the XY line is 60mm.	15
	6. A straight line PQ 80mm long appears to a length of 50mm and inclined at 30° to xy line in its side view. Draw its projection when its end point P is 15mm above HP and 60mm in front of VP. Point Q is nearer to VP than P.	15
	7. Draw the projections of a line PQ and find its apparent lengths, true length and true inclination with HP when the line PQ has its end P 25mm above HP and 20mm in front of VP. The distance between the end projectors of the line when measured parallel to the line of intersection of the HP & VP is 60mm. The end Q is 50mm above the HP and the line is inclined at 30° to the VP.	15
III	1. An equilateral triangular lamina of 25mm side lies with one of its edges on HP such that the surface of the lamina is inclined to HP at 60°. The edge on which it rests is inclined to VP at 60°. Draw the projections.	20
	2. An equilateral triangular lamina of 25mm side lies on one of its sides on HP. The lamina makes 45° with HP and one of its medians is inclined at 40° to VP. Draw its projections.	20
	3. A triangular lamina o f25mm sides rests on one of its corners on VP such that median passing through the corner on which it rests is inclined to HP at 30° and draw its projections.	20
	4. A triangular plane figure of sides 25mm is resting onHP with one of its corners, such that the surface of the lamina makes an angle of 60° with HP. If the side opposite to the corner on which the lamina rests makes an angle of 30° with VP, draw the top and front views in this position.	20
	5 A triangular plane lamina of sides 25mm is resting on HP with one of its corners touching it, such that the side opposite to the corner on which it rests is 15mm above HP and makes an angle of 30° with VP. Draw the top and front views in this position. Also determine the inclination of the lamina to the reference plane.	20
	6. A pentagonal lamina having edges 25mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30 to HP and 45 VP. Draw the top and front views of the lamina.	20
	7. A hexagonal lamina of 30mm sides rests on HP with one of its corners touching VP and surface inclined at 45 to it. One of its edges is inclined to HP at 30 . Draw the	

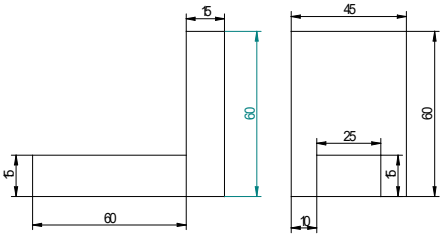
	front and top views of the lamina in its final position.	
IV	1. A square prism 35mm sides of base and 60mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 and to VP at 30 . 2. A pentagonal prism 25mm sides of the base and 60mm axis length rests on HP on one of its edges of the base. Draw the projections of the prisms when the axis is inclined to HP at 40 and VP at 30 3. A hexagonal prism 25mm sides of base and 50mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests makes equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 and appears to be inclined to VP at 45 . 4. A hexagonal prism 25mm sides of base and 50mm axis length is suspended freely from a corner of its base. Draw the projections of the prism when the axis appears to be inclined to VP at 45 . 5. A square pyramid 35mm sides of base and 60mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45 and VP at 30 . 6. A hexahedron of 30mm sides is resting on one of its corners on HP such that one of its solid diagonals is perpendicular to VP. Draw the projections of the solid. 7. A cone of base Φ 40mm axis length 50mm is resting on HP on a point on the circumference of its base such that its apex is at 40mm above the HP and its top view of the axis is inclined at 60 to VP. Draw the top and front views of the solid. Also, determine the inclinations of the axis when the base is nearer to the observer.	20 20 20 20 20 20
V	1. Isometric projection of hexahedron (cube), right regular prisms, pyramids with illustrative examples. 1. Isometric projection of cylinders, cones, spheres, cut spheres with illustrative examples. 2. Isometric projection of combination of solids – two solids and three solids with illustrative examples from VTU question bank . 3. Lab session on sketching and computer aided drafting of above combination of solids. 4. The following fig shows the top view of the cylinder which is centrally mounted on a frustumof pentagonal pyramid of 60 mm height. Draw the isometric projection of the combination of solids  5. Following fig shows the front view of the combination of solids consisting a cut sphere and frustums of a cone and a square pyramid. Draw the isometric projections of the combination of solids.	



8 . Following fig shown the front and side views of the solid. Draw the isometric projection of the solid.



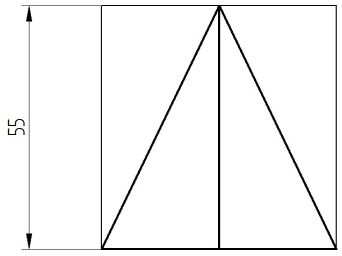
9 .Following fig shows the front and side views of the solid. Draw the isometric projection of the solid



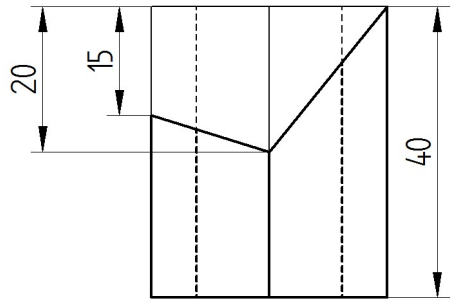
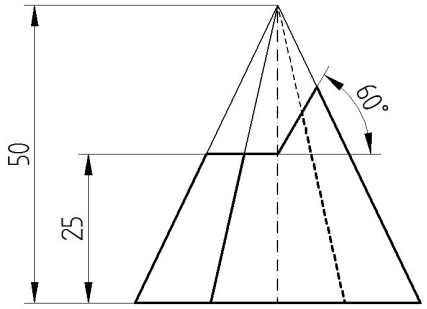
VI

1.A square prism of base side 40mm and axis length 65mm is resting on HP on its base with all the vertical faces being equally inclined to VP. It is cut by an inclined plane 600 to HP and perpendicular to VP and is passing through a point on the axis at distance 15mm form the top face. Draw the development of the lower portion of the prism. — 20

2.A Square prism of base side 35mm & height 55mm rests with its base on HP and two faces equally inclined to VP. Draw the development of lateral surfaces of the retained portions of the cut prism shown by dark lines in the figure. — 20



3. A pentagonal prism of base sides 30mm and axis length 60mm rests with its base — 20

	on HP and an edge of the base inclined at 45° to VP. It is cut by plane perpendicular to VP, inclined at 40° to HP and passing through a point on axis, at distance of 30mm from the base. Develop the remaining surfaces of the truncated prism. 4. A pentagonal prism of base sides 20 mm and height 40 mm is resting with its base on HP with a base edge parallel to VP. The prism is cut as shown in the following front view. Draw the development of lateral surface of prism.  5. A rectangular pyramid, side of base 25 mm × 40 mm and height 50mm has one of the sides of the base inclined at 30° to VP. Draw the development of the lateral surface of the cut pyramid, whose front view shown below. 	20 20
VII	**Multidisciplinary Applications & Practice *:*** **Free hand Sketching;** True free hand, Guided Free hand, Roads, Buildings, Utensils, Hand tools & Furniture's etc **Drawing Simple Mechanisms;** Bicycles, Tricycles, Gear trains, **Electric Wiring and lighting diagrams;** Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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. **Graphs & Charts**: Like, Column chart, Pie chart, Line charts, Gantt charts, etc. using Microsoft Excel or any suitable software.	25 25 25 25

15.0 QUESTION BANK

Module-I

Projection of Points

1. Draw the projection of the following points on the same XY line, keeping convenient distance between each projector. Name the Quadrants in which they lie.

a. A - 30 mm above HP & 35 mm in front of VP.
b. B - 35 mm above HP & 40 mm behind VP.
c. C - 40 mm above HP & on VP.
d. D - 35 mm below HP & 30mm in front of VP.

2. A point G is 25mm below HP & situated in the third quadrant its shortest distance from XY line is 45 mm. Draw its projections and find its distance from VP.
3. A point S is in the first quadrant and equidistance of 50 mm from all the three principle planes Draw the projection of the point. Draw all the three views of the point.
4. A point P is 30mm in front of VP, 40mm above HP and 50mm from RPP. Draw its projections.
5. A point is 35mm below HP, 20mm behind VP and 25mm behind/in front/ from RPP. Draw its projections and name the side view.
6. A point is 35mm below HP, 15mm behind VP & 25mm behind/in front/from RPP. Draw the projection and name the side view.

Projection of Straight Lines

1. The line AB 100 mm line measures 80 mm in the front view and 70 mm in the top view. The midpoint M of the line is 40 mm from both HP and VP. Draw its projections and find its inclinations.
2. Draw the projection of the line PQ and find its true length and inclination, when the line is inclined at 30 deg to the HP and 45 deg to VP. The line is having one of its end 15 mm above HP and 20 mm in front of VP. The distance between the end projectors on the X-Y line is 60 mm.
3. Two lines AB and AC make an angle of 120 deg between them in their front view and top view of a triangular lamina ABC. AB is parallel to both HP and VP. Determine the real angle between the sides of the triangle AB and AC.
4. A straight road going uphill from point A, due east to another point B, is 4 km long and has a slope of 15 deg. Another straight road from B due 30 deg east of north to a point C is also 4 km long but is on ground level. Determine the length and the slope of a straight road joining the points A and C. Scale; 10 mm = 0.4 km.
5. An object O is placed 1.2 m above the ground and the center of room 4.2 m x 3.6 m x 3.6 m high. Determine graphically its distance from one of the corners between the roof and the two adjacent walls. Scale; 10 mm = 0.5 m

Projection of Plane Surfaces

1. An isosceles triangular plate of negligible thickness has a base 25 mm long and altitude 35 mm. It is so placed on HP such that in the front view it is seen as an equilateral triangle of 25 mm sides that is parallel to VP is inclined at 45 deg to HP. Draw its top and front views. Also determine the inclination of the plate with the reference plane.
2. A square plate of 30 mm sides rests on HP such that one of its diagonals is inclined at 30 deg to HP and 45 deg to VP. Draw its projections.
3. A mirror 30 mm x 40 mm is inclined to the wall such that its front view is a square of 30 mm side. The longer side of the mirror appears perpendicular to both HP and VP. Find the inclinations of the mirror with the wall.
4. A pentagonal lamina having edge 25 mm is placed on one of its corners on HP such that the perpendicular bisector of the edge passing through the corner on which the lamina rests is inclined at 30 deg to HP and 45 deg to VP. Draw the top and front views of the lamina.
5. A pentagonal lamina of sides 25 mm is having a side both on HP and VP. The surface of the lamina is inclined at an angle of 60 deg to HP. Draw the top and front view of the lamina.
6. A pentagonal lamina having edges 25 mm is placed on one of its corners on VP such that the surface makes an angle of 30 deg with VP and perpendicular bisector of the edge passing through the corner on which it rests makes an inclination to HP at 45 deg. Draw the top and front views of the lamina.

7. A hexagonal lamina of 30 mm sides rests on HP with one of its corners touching VP and surface inclined at 45 deg to it. One of its edges is inclined to HP at 30 deg. Draw the front and top views of the lamina in its final position.
8. A regular hexagonal lamina of sides 25 mm is lying in such a way that one of its sides on HP, while the side opposite to the side on which it rests is on VP. If the lamina makes 60 deg to HP, draw its projections.
9. A hexagonal lamina of sides 25 mm rests on one of its sides on VP. The lamina makes 45 deg to VP and the side on which it rests makes an angle of 45 deg to HP. Draw its projections.
10. A hexagonal lamina of sides 25 mm rests on one of its corners on HP. The lamina makes 45 deg to HP and the diagonal passing through the corner on which it rests appears to be inclined at 30 deg to VP. Draw its projections.
11. A circular lamina of 50 mm diameter rests on HP such that one of its diameters is inclined at 30 deg to VP and 45 deg to HP. Draw its projections.
12. A circular lamina inclined to VP appears in the front view as an ellipse of major axis 30 mm and minor axis 15 mm. The major axis is parallel to both HP and VP. One end of the minor axis is in both HP and VP. Draw its projections and determine the inclinations of the lamina with the VP.
13. An equilateral triangular lamina of 25 mm sides lies on one of its sides on HP. The lamina makes 45 deg with HP and one of its medians is inclined at 45 deg to VP. Draw its projections.

Module – II

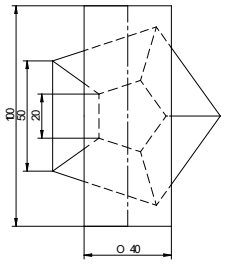
Projections of solids

1. A square prism 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
2. A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that two base edges containing the corner on which it rests makes equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
3. A pentagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the prism when the axis is inclined to HP at 40 deg and VP at 30 deg.
4. A hexagonal prism 25 mm sides of base and 50 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the prism when the axis of the prism is inclined to HP at 40 deg and to VP at 30 deg.
5. A pentagonal prism 25 mm sides of base and 50 mm axis length is suspended freely from the corner of the base. Draw the projections of the prism when the axis is appears to be inclined to VP at 45 deg.
6. A square pyramid 35 sides of base and 65 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 deg. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg.
7. A square pyramid 35 mm sides of base and 60 mm axis length rests on HP on one of its corners of the base such that the two base edges containing the corner on which it rests make equal inclinations with HP. Draw the projections of the pyramid when the axis of the pyramid is inclined to HP at 40 deg and to VP at 30 deg.
8. A pentagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg and VP at 30 deg.
9. A hexagonal pyramid 25 mm sides of base and 50 mm axis length rests on HP on one of its edges of the base which is inclined to VP at 30 deg. Draw the projections of the pyramid when the axis is inclined to HP at 45 deg.
10. A pentagonal pyramid 25 mm sides of base and 50 mm axis length is suspended freely from the corner of its base. Draw the projections of the pyramid when the axis appears to be inclined to VP at 45 deg.

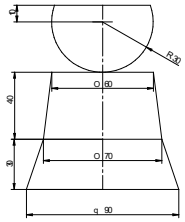
Module - III

Isometric Projections

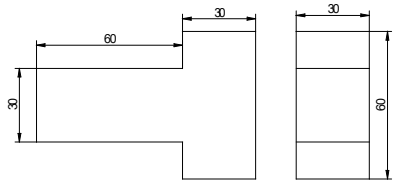
1. A hemisphere of 40 mm diameter is supported co-axially on the vertex of a cone of base diameter 60 mm and axis length 50 mm. The flat circular face of the hemi-sphere is facing upside. Draw the isometric projection of the combination of solids.
2. Draw the isometric projection of rectangular prism of 60 x 80 x 20 mm thick Para mounting a tetrahedron of side 45 mm such that the axis of the solids is collinear and at least one of the edges of the solids are parallel to VP.
3. A cone of base diameter 40 mm and height 50 mm rests centrally over a frustum of a pentagonal pyramid of base side 45 mm and top side 35 mm and height 55 mm. Draw the isometric projections of the solids.
4. The following fig shows the top view of the cylinder which is centrally mounted on a frustumof pentagonal pyramid of 60 mm height. Draw the isometric projection of the combination of solids.



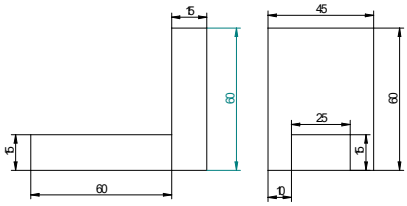
5. Following fig shows the front view of the combination of solids consisting a cut sphere and frustums of a cone and a square pyramid. Draw the isometric projections of the combination of solids.



6. A sphere of diameter 30 mm rests on the frustum of a hexagonal pyramid base 30 mm, top face 18 mm and the height 50 mm such that the axes coincide. Draw the isometric projection of the combination of the solids.
7. Following fig shown the front and side views of the solid. Draw the isometric projection of the solid.



8. Following fig shows the front and side views of the solid. Draw the isometric projection of the solid

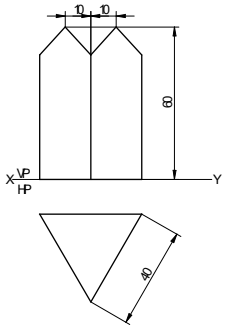


9. A sphere of diameter 40 mm is placed centrally on the flat face of the hemisphere dia 60 mm. Draw the isometric projection of the combination.
10. Three rectangular slabs (l x b x h) 100 mm x 60 mm x 20 mm, 100 mm x 40 mm x 20 mm and 100 mm x 20 mm x 20 mm are placed one above the other in the descending order of their width b such that their longer axes are coplanar. Draw the isometric projection of the combination.

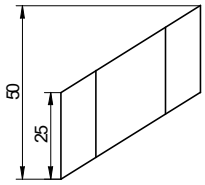
Module – IV

Development of Lateral Surfaces of Solids

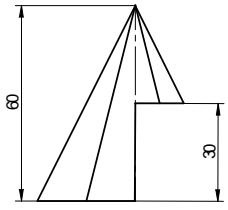
1. Draw the development of truncated portion of lateral faces of pentagonal prism of 20 mm sides of base and 50 mm height standing vertically with one of its rectangular faces parallel to VP and nearer to it so as to produce one piece development. The inclined face of the truncated prism is 30 deg to its axis an passes through the right extreme corner of the top face of the prism.
2. A triangular prism with one of its rectangular faces parallel to VP and nearer to it is cut as shown in the fig. Draw the development of the retained portions of the prism which are shown in dark lines.



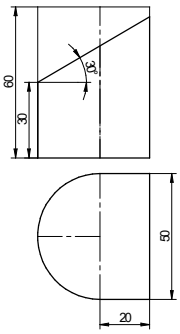
3. A hexagonal prism of base side 20 mm and height 50 mm is resting on HP on its base, such that one of its base edge is parallel to VP. The prism is cut in this position as shown in the following front view. Draw the development of the lateral surface of the prism.



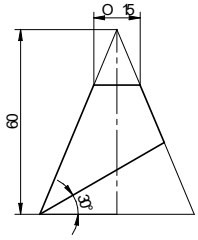
4. The inside of the hopper of the floor mill is to be lined with thin sheet. The top and bottom of the hopper are regular pentagon with each side equal to 30 mm and 22.5 mm respectively. The height of the hopper is 30 mm. Draw the shape of the sheet to which it is to be cut so as to fit into the hopper.
5. A square pyramid of side of base 45 mm, altitude 70 mm is resting with its base on HP with two sides of the base parallel to VP. The pyramid is cut by section plane which is perpendicular to VP and inclined at 40 deg to the HP. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surfaces of the truncated pyramid.
6. The hexagonal pyramid of 30 mm base sides with a side of the base parallel to VP. Draw the development of the lateral surfaces of the retained portions of the pyramid cut by two perpendicular planes shown by dark lines in the fig.



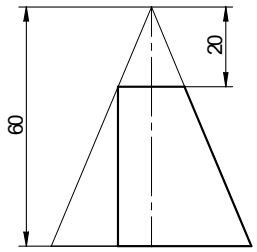
7. A pipe made of using half tubular (circular) with a half square in shape is cut as shown in the following in the fig. Draw the development of the lateral surface of the object.



8. Draw the development of the lateral surface of the cone whose front view is shown in the following fig.



9. A funnel is to be made of sheet metal. A funnel tapers from 40 mm to 20 mm diameter to a height of 20 mm and from 20 mm to 15 mm diameter for the next 20 mm height. The bottom of the funnel is beveled off to a plane inclined at 45 deg to the axis. Draw the development of the funnel.
10. Draw the development of lateral surface of the cut cone whose front view is shown in the fig.



Module-V

Multidisciplinary Applications & Practice

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

Drawing Simple Mechanisms; Bicycles, Tricycles, Gear trains,

Electric Wiring and lighting diagrams; Like, Automatic fire alarm, Call bell system, UPS system, Basic powerdistribution 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.

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

	S J P N Trust's **Hirasugar Institute of Technology, Nidasoshi** *Inculcating Values, Promoting Prosperity* Approved by AICTE, New Delhi, Permanently Affiliated to VTU, Belagavi Recognized under 2(f) &12B of UGC Act, 1956 Accredited at 'A' Grade by NAAC & Programmes Accredited by NBA: CSE & ECE	**First Year Engg. Dept.** **Academics** **Course Plan** **2023-24 (Evn)**

Prepared by	Checked by		
Prof.Girish Zulapi	**Prof.D.N.Inamdar**	**HOD**	**Principal**

Subject Title	**Introduction to Python Programming**		
Subject Code	BPLCK205B	**CIE Marks**	50
Number of Lecture Hrs / Week (L:T:P)	2:0:2:0	**SEE Marks**	50
Total Number of Lecture Hrs	40 Hours Theory + 10 slab slots	**Exam Hours**	03
			CREDITS – 03

FACULTY DETAILS:		
Name: Smt.Purnima Savadatti	**Designation:** Asst.Professor	**Experience:** 08 Years
No. of times course taught: 03	**Specialization:** Digital Electronics	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	Students should have the knowledge of basic subjects	PUC	Mathematics.

2.0 Course Objectives

1. Learn the syntax and semantics of the Python programming language.
2. Illustrate the process of structuring the data using lists, tuples.
3. Appraise the need for working with various documents like Excel, PDF, Word and Others.
4. Demonstrate the use of built-in functions to navigate the file system.
5. Implement the Object Oriented Programming concepts in Python.

3.0 Course Outcomes

Having successfully completed this course, the student will be able to

CO	Course Outcome	Cognitive Level	POs
C145.1	Demonstrate proficiency in handling loops and creation of functions.	L_1,L_2	PO1, 2, 3, 8, 10,12
C145.2	Identify the methods to create and manipulate lists, tuples and dictionaries.	L_1,L_2	PO1, 2, 3, 8, 10,12
C145.3	Develop programs for string processing and file organization.	L_1,L_2	PO1, 2, 3, 8, 10,12
C145.4	Interpret the concepts of Object-Oriented Programming as used in Python.	L_1,L_2	PO1, 2, 3, 8, 10,12
Total Hours of instruction		**40**	

4.0 Course Content

Module- 1

Python Basics: 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, Flow control: 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(), Functions: def Statements with Parameters, Return Values and return Statements,The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number.

Textbook 1: Chapters 1 – 3

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Module-2

Lists: 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, Dictionaries and Structuring Data: The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things. Textbook 1: Chapters 4 –5

Module-3

Manipulating Strings: Working with Strings, Useful String Methods,Project: Password Locker, Project: Adding Bullets to Wiki Markup Reading and Writing Files: 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. Textbook 1: Chapters 6, 8

Module-4

Organizing Files: 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, Debugging: Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE"s Debugger. Textbook 1: Chapters 9-10

Module-5

Classes and objects: Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying, Classes and functions: Time, Pure functions, Modifiers, Prototyping versus planning, Classes and methods: Object-oriented features, Printing objects, Another example, A more complicated example, Theinit method, The str method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation. Textbook 2: Chapters 15 – 17

Sl. NO	Experiments
1a.	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.
1b.	Develop a program to read the name and year of birth of a person. Display whether the person is a senior citizen or not.
2a.	Develop a program to generate Fibonacci sequence of length (N). Read N from the console.
2b.	Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).
3.	Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages.
4.	Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable message.
5.	Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary 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.

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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 >=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.]

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	VII	Project Work	IoT Technology, Automation

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Used with IoT technology.
02	Python is efficient and reliable language, allowing developers to create powerful applications with a minimum effort.

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Additional programs related to real world interfacing.

8.0 Books Used and Recommended to Students

Text Books: Suggested Learning Resources

1.Al Sweigart,"Automate the Boring Stuff with Python",1 stEdition, 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 nd Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at http : // greenteapress . com / think python2 / thinkpython2.pdf (Chapters 13, 15, 16, 17, 18) (Download pdf / html files from the above link).

Additional Learning 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-

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9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
1. https://www.w3schools.com/python/python_intro.asp
2. https://www.python.org/about/gettingstarted/
3. https://www.tutorialspoint.com/python/index.htm
4. https://realpython.com/tutorials/web-dev/

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	The Python Papers (ISSN: 1834-3147) is a free e-journal	https://journaldatabase.info/journal/issn1834-3147

11.0 Examination Note

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 shall be 25 marks and for the laboratory component 25 Marks.

CIE for the theory component of the IPCC:

- Three Tests each of 25 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Average of best two IA tests each of 25marks scale down to 15marks.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one course project totaling 10 marks.

CIE for the practical component of the IPCC:

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 10 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 15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to 05 marks.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for 25 marks.

The minimum marks to be secured in CIE to appear for SEE shall be 10 in the theory component and 10 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 05 questions is to be set from the practical component of IPCC, the total marks of all questions should not be more than 25 marks.

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12.0 Course Delivery Plan

Module No.	Lecture No.	Content of Lecture	% of Portion
1	1	Python Basics. Entering Expressions into the Interactive Shell. The Integer, Floating-Point, and String Data Types. String Concatenation and Replication.	20
	2	Storing Values in Variables. Your First Program. Dissecting Your Program. Flow control.	
	3	Boolean Values. Comparison Operators. Boolean Operators. Mixing Boolean and Comparison Operators	
	4	Elements of Flow Control. Program Execution. Flow Control Statements	
	5	Importing Modules. Ending a Program Early with sys.exit()	
	6	Functions: def Statements with Parameters. Return Values and return Statements. The None Value	
	7	Keyword Arguments and print(). Local and Global Scope. The global Statement	
	8	Exception Handling , A Short Program: Guess the Number	
2	9	Lists: The List Data Type	20
	10	Working with Lists	
	11	Augmented Assignment Operators, Methods	
	12	Example Program. Magic 8 Ball with a List	
	13	List-like Types: Strings and Tuples, references	
	14	Dictionaries and Structuring Data: The Dictionary Data Type	
	15	Pretty Printing	
	16	Using Data Structures to Model Real-World Things	
3	17	Manipulating Strings: Working with Strings. Useful String Methods.	20
	18	Project: Password Locker	
	19	Project: Adding Bullets to Wiki Markup Reading and Writing	
	20	Files: Files and File Paths, The os.path Module	
	21	The File Reading/Writing Process. Saving Variables with the shelve Module	
	22	Saving Variables with the print.format() Function	
	23	Project: Generating Random Quiz Files	
	24	Project: Multiclipboard	
4	25	Organizing Files: The shutil Module, Walking a Directory Tree	20
	26	Compressing Files with the zipfile Module	
	27	Project: Renaming Files with American-Style Dates to European-Style Dates	
	28	Project: Backing Up a Folder into a ZIP File	
	29	Debugging: Raising Exceptions	
	30	Getting the Traceback as a String	
	31	Assertions, Logging	
	32	IDLE"s Debugger	
5	33	Classes and objects: Programmer-defined types, Attributes	20
	34	Rectangles, Instances as return values	
	35	Objects are mutable, Copying, Classes and functions: Time, Pure functions	

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	36	Modifiers, Prototyping versus planning, Classes and methods: Object-oriented features,	
	37	Printing objects Another example	
	38	A more complicated example, Theinit method	
	39	The str method Operator overloading, Type-based dispatch, Polymorphism	
	40	Interface and implementation	

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment	Students study the topics and write the programs for given task.	Module 1, 2,3,4 and 5 of the syllabus	8	Individual Activity.	Books 1&2 of Text Book list.
2	Quiz	Students study the topics and choose the suitable option for the given questions.	Module 1,2,3,4 and 5 of the syllabus	10	Individual Activity.	Books 1 & 2 of Text Book list.

14.0 QUESTION BANK

MODULE 1

1. What is an arithmetic expression? . What is the output of this statement? 'hello world' + 100 + 'how are you' explain the reason if the statement produces an error.
2. Discuss various methods of importing modules in Python programs. Which method is best?. Explain.
3. What is the lambda function? Explain with an example of addition of two numbers.
4. What is a flow control statement?. Discuss if and if else statements with flow chart.
5. Write a python program to add n numbers accepted from the user.
6. How can you prevent a python program from crashing? Discuss different ways to avoid crashing.

MODULE 2

1. Discuss list and dictionary data structure with example for each.
2. write a python program to accept n numbers and store them in a list. Then print the list without ODD numbers in it
3. For a=['hello', 'how', [1,2,3], [[10,20,30]]] what is the output of following statement (i) print(a[: :]) (ii) print(a[-3][0]) (iii) print(a[2][: -1]) (iv) print(a[0][: : -1]).
4. Write a python program to read dictionary data and delete any given key entry in the dictionary.
5. Explain different clipboard functions in python used in wiki markup
6. Using string slicing operation write python program to reverse each word in a given string (eg: input: "hello how are you", output: "olleh woh era uoy")

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MODULE 3

1. Discuss different paths of file system.
2. Explain how to read specific lines from a file?. illustrate with python program.
3. What is logging? how this would be used to debug the python program?
4. What is the use of ZIP? how to create a ZIP folder explain.
5. Write an algorithm for implement multi clipboard functionality
6. Discuss how lists would be written in the file and read from the file?

MODULE 4

1. Define the terms with example: (i) class (ii) objects (iii) instance variables.
2. Create a Time class with hour, min and sec as attributes. Demonstrate how two Time objects would be added.
3. Discuss __str__() and __init__() methods used in class definition.
4. What is Encapsulation? Discuss with an example in which access specifiers are used in class definition.
5. What is a class diagram? Create empty class and corresponding class diagram for following statements (i) class A derives from class B and Class C (ii) Class D derived from Class A defined in statement.
6. Discuss polymorphism and demonstrate with and python program.

MODULE 5

1. Write python program to read cell 2C from sheet 2 of workbook.
2. Explain how pdf pages would created in a pdf document with example.
3. What is JSON? discuss with example. Compare it with dictionary.
4. Compare and contrast Excel and CSV files.
5. Demonstrate how a Class would be converted into JSON object with an example.
6. Explain how a page from different PDFs files would be merged into a new PDF file?

Prepared by	Checked by		
Smt.P.I.Savadatti	Shri.M.P.Yenagimath	HOD	Principal

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Professional Writing Skills in English			
Subject Code	**BPWSK206**	**CIE Marks**: IA-Tests(20) + Assignments(10)+	**50**
Teaching Hours/Week (L:T:P:S)	**2:0:0:0**	**SEE Marks**	**50**
Total Hours of Pedagogy	**02 Hours/Week**	**Total marks (CIE + SEE)**	**100**
Credits	**02**	**SEE Hours**	**02**

FACULTY DETAILS:		
Name: Prof. B. S. Hooli	**Designation:** Lecturer	**Experience:** 20 Yrs
No. of times course taught: 2	**Specialization:** English	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	-	-	Basic English Skills

2.0 Course Objectives

The course (BPWSK206) will enable the students,

- To Identify the Common Errors in Writing and Speaking of English.
- To Achieve better Technical writing and Presentation skills for employment.
- To read Technical proposals properly and make them to Write good technicalreports.
- Acquire Employment and Workplace communication skills.
- To learn about Techniques of Information Transfer through presentation indifferent level.

3.0 Course Outcomes

At the end of the course (BPWSK206) the student will be able:

CO	Course Outcome	Cognitive Level	POs
C112.1	To understand and identify the Common Errors in Writing and Speaking.	L1,L2	1,2,3,8,10
C112.2	To Achieve better Technical writing and Presentation skills.	L1,L2,L3	1,2,3,8,10

C112.3	To read Technical proposals properly and make them to Write good technical reports.	L1,L2,L3	1, 2, 3,8,10

C112.4	Acquire Employment and Workplace communication skills.	L1,L2,L3	1, 2,3,8,10
C112.5	To learn about Techniques of Information Transfer through presentation in different level.	L1,L2,L3	1, 2,3,8,10

4.0 Course Content

Module-1

Identifying Common Errors in Writing and Speaking English:

- Advanced English Grammar for Professionals with exercises, Common errors identification in parts of speech, Use of verbs and phrasal verbs, Auxiliary verbs and their forms, Subject Verb Agreement (Concord Rules with Exercises).
- Common errors in Subject-verb agreement, Noun-pronoun agreement, Sequence of Tenses and errors identification in Tenses. Advanced English Vocabulary and its types with exercises – Verbal Analogies, Words Confused/Misused.

Module -2

Nature and Style of sensible writing:

- Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion, Importance of Proper Punctuation, The Art of Condensation (Precise writing) and Techniques in Essay writing, Common Errors due to Indianism in English Communication, Creating Coherence and Cohesion, Sentence arrangements exercises, Practice of Sentence Corrections activities. Importance of Summarising and Paraphrasing.
- Misplaced modifiers, Contractions, Collocations, Word Order, Errors due to the Confusion of words, Common errors in the use of Idioms and phrases, Gender, Singular & Plural. Redundancies & Clichés.

Module- 3

Technical Reading and Writing Practices:

- Reading Process and Reading Strategies, Introduction to Technical writing process,
- Understanding of writing process, Effective Technical Reading and Writing Practices , 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 – Voice and Speech (Active and Passive Voices) and Reported Speech, Spotting Error Exercises, Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.

Module- 4

Professional Communication for Employment:

- The Listening Comprehension, Importance of Listening Comprehension, Types of Listening, Understanding and Interpreting, Listening Barriers, Improving Listening Skills. Attributes of a good and poor listener.
- Reading Skills and Reading Comprehension, Active and Passive Reading, Tips for effective reading.
- Preparing for Job Application, Components of a Formal Letter, Formats and Types of official, employment, Business Letters, Resume vs Bio Data, Profile, CV and others, Types of resume, Writing effective resume for employment, Model Letter of Application (Cover Letter) with Resume, Emails, Blog Writing, Memos (Types of Memos) and other recent communication types.

Module-5

Professional Communication at Workplace:

- Group Discussions – Importance, Characteristics, Strategies of a Group Discussions. Group Discussions is a Tool for Selection. Employment/ Job Interviews - Importance, Characteristics,

Strategies of a Employment/ Job Interviews. Intra and Interpersonal Communication Skills - Importance, Characteristics, Strategies of a Intra and Interpersonal Communication Skills. Non-Verbal Communication Skills (Body Language) and its importance in GD and PI/JI/EI.

- Presentation skills and Formal Presentations by Students - Importance, Characteristics, Strategies of Presentation Skills. Dialogues in Various Situations (Activity based Practical Sessions in class by Students).

5.0 Suggested Learning Resources

Text Books

1. **A Course in Technical English,** Cambridge University Press – 2020.
2. **Functional English (As per AICTE 2018 Model Curriculam)** Cengage learning India Pvt Limited [Latest Revised Edition] - 2020.
3. **Communication Skills** by Sanjay Kumar and Pushp Lata, Oxford University Press - 2018. Refer it's workbook for activities and exercises – "Communication Skills – I (A Workbook)" published by Oxford University Press – 2018.
4. **Professional Writing Skills in English,** Infinite Learning Solutions – (Revised Edition) 2021.
5. **Technical Communication –** Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharma, Oxford University Press 2017.
6. **High School English Grammar & Composition** by Wren and Martin, S Chandh & CompanyLtd – 2015.
7. **Effective Technical Communication** – Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private Limited – 2018.
8. **Intermediate Grammar, Usage and Composition** by M.L.Tichoo, A.L.Subramanian,

6.0 Examination Note

Assessment Details (both CIE and SEE):

Continuous internal evaluation (CIE) needs to be conducted for 50 marks like Engineering courses. The weight age of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 40% of maximum marks in CIE and 35% of maximum marks in SEE to pass. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration). Based on this grading will be awarded.

Continuous Internal Evaluation (CIE) :

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

All the tests are preferred similar to SEE pattern; however, the teacher may follow test pattern similar to other theory courses of Engineering.

Two assignments each of 10 Marks

4. First assignment at the end of 4th week of the semester.

5. Second assignment at the end of 9th week of the semester.

Report writing /Group discussion/Seminar any one of three suitably planned to attain the COsand POs for **20 Marks (duration 01 hours)**

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100marks and will be **scaled down to 50 marks**

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

Semester End Examinations (SEE)

SEE paper will be set for 100 questions of each of 01 marks. The pattern of the question paper is MCQ. The time allotted for SEE is 120 minutes. Marks scored are scaled down to 50 Marks.
(Time duration may be made 90 minutes to train the students for engineering / non-engineering competitive examination)

1. Professional Writing Skills in English has become a very important component in all engineering and non-engineering competitive examinations. In exams like GRE, TOEFL, IELTS and GATE exam, all state and Central Government recruitment examinations, placement tests and other Examinations, so the pattern of question paper, in general, will be in multiple-choice question (MCQ) Pattern. So, to meet the relevance of the recruitment requirement of our Engineering students "Professional writing skill in English" Semester end examination (SEE) will be conducted in a multiple choice question (MCQ) pattern.
1. MCQ Pattern (Multiple Choice Questions) Semester End Exam (SEE) is conducted for 50 marks (120 minutes duration).

7.0 Course Delivery Plan

Module	Lecture No.	Content of Lecture		% of Portion
		PART - A	**Teaching-Learning Process**	
1	1	Advanced English Grammar for Professionals with exercises	Chalk &board, PPT, Animation, Active Learning	20
	2	Common errors identification in parts of Speech		
	3	Use of verbs and phrasal verbs, Auxiliary verbs and their forms		
	4	Subject Verb Agreement (Concord Rules with Exercises)		
	5	Common errors in Subject-verb agreement, Noun pronoun agreement, Sequence of Tenses and errors identification in Tenses.		
	6	Advanced English Vocabulary and its types with exercises – Verbal Analogies, Words Confused/Misused.		

2	7	Organizing Principles of Paragraphs in Documents, Writing Introduction and Conclusion.		20

	8	Importance of Proper Punctuation, The Art of Condensation (Precise writing) and Techniques in Essay writing, Common Errors due to Indianism in English Communication	Chalk & board, Active Learning, Problem based learning	
	9	Creating Coherence and Cohesion, Sentence arrangements exercises, Practice of Sentence Corrections activities. Importance of Summarising and Paraphrasing.		
	10	Misplaced modifiers, Contractions, Collocations, Word Order		
	11	Errors due to the Confusion of words		
	12	Common errors in the use of Idioms and phrases, Gender, Singular & Plural. Redundancies & Cliches.		
3	13	Reading Process and Reading Strategies, Introduction to Technical writing process.	Chalk & board, PPT, Animation, NPTEL, Active Learning	20
	14	Understanding of writing process, Effective Technical Reading and Writing Practices		
	15	Introduction to Technical Reports writing, Significance of Reports, Types of Reports.		
	16	Introduction to Technical Proposals Writing, Types of Technical Proposals, Characteristics of Technical Proposals. Scientific Writing Process.		
	17	Grammar – Voice and Speech (Active and Passive Voices) and Reported Speech.		
	18	Spotting Error Exercises, Sentence Improvement Exercises, Cloze Test and Theme Detection Exercises.		
4	19	The Listening Comprehension, Importance of Listening Comprehension, Types of Listening, Understanding and Interpreting, Listening Barriers.	Chalk& board, Problem based learning	20
	20	Improving Listening Skills. Attributes of a good and poor listener.		
	21	Reading Skills and Reading Comprehension, Active and Passive Reading, Tips for effective reading.		
	22	Preparing for Job Application, Components of a Formal Letter, Formats and Types of official, employment, Business Letters.		
	23	Resume vs Bio Data, Profile, CV and others, Types of resume, Writing effective resume for employment		
	24	Model Letter of Application (Cover Letter) with Resume, Emails, Blog Writing, Memos (Types of Memos) and other recent communication types.		
5	25	Group Discussions – Importance, Characteristics, Strategies of a Group Discussions.	Chalk& board, Problem based learning	20
	26	Group Discussions is a Tool for Selection. Employment/ Job Interviews - Importance, Characteristics, Strategies of a Employment/ Job Interviews.		

	27	Intra and Interpersonal Communication Skills - Importance, Characteristics, Strategies of a Intra and Interpersonal Communication Skills		
	28	Non-Verbal Communication Skills (Body Language) and its importance in GD and PI/JI/EI.		
	29	Presentation skills and Formal Presentations by Students - Importance, Characteristics, Strategies of Presentation Skills.		
	30	Dialogues in Various Situations (Activity based Practical Sessions in class by Students).		

Examination	S+	S	A	B	C	D	E	F	% Passing
JAN - 2021									
JAN - 2020									
JAN - 2019									

Prepared by	Checked by		
Prof. B. S. Hooli	Dr. K. B. Manwade	HOD	Principal

Subject Title	**INNOVATION and DESIGN THINKING**		
Subject Code	BIDTK258	**CIE(50)+SEE(50)**	100
Number of Lecture Hrs/Week	1L	**Exam Marks(appearing for)**	100 & reduced to 50 for grade
Total Number of Lecture Hrs	15	**Exam Hours**	01 per division
CREDITS – 01			

FACULTY DETAILS:		
Name: Dr.Sshashikant Walki	**Designation:** Asst. Professor	**Experience:** 08 years
No. of times similar course taught:03	**Specialization:** Chemistry	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	Any	PUC level	Reasoning, Analytical & Critical thinking abilities

2.0 Course Objectives

- To explain the concept of design thinking for product and service development
- To explain the fundamental concept of innovation and design thinking
- To discuss the methods of implementing design thinking in the real world.

3.0 Course Outcomes

CO	Course Outcome	RBTL	POs
C109.1	Appreciate various design process procedure	L2	PO1-PO7, PO9, PO11 & PO12
C109.2	Generate and develop design ideas through differenttechnique	L2	PO1-PO7, PO9, PO11 & PO12
C109.3	Identify the significance of reverse Engineering to Understand products	L2	PO1-PO7, PO9, PO11 & PO12
C109.4	Draw technical drawing for design ideas	L3	PO1-PO7, PO9, PO11 & PO12
C109.5	Empathizing prototyping & testing	L1	PO1-PO7, PO9, PO11 & PO12

4.0 University Course Content

Module-1
PROCESS OF DESIGN
Understanding Design thinking
Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping
Module-2
Tools for Design Thinking
Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design

Module-3

Design Thinking in IT :

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

Module-5

Design thinking workshop:

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

5.0 Relevance to future Subjects/Lab/Project

Sl. No	Semester	Subject/Lab/Project	Topics
01	All Sem	Subjects, labs and Project include Design & development of engineering systems. Solving of complex engineering problems through innovations through multidisciplinary concepts Business modeling and prototyping	All modules

6.0 Relevance to Real World

SL.No	Real World Mapping
01	Resolving real time problems and issues by innovation and design thinking
02	Solving of complex engineering problems through innovations through multidisciplinary concepts
03	Business modeling and prototyping

7.0 Gap Analysis and Mitigation

Sl. No	Gap/s	Mitigation
01	Ability to think, design and complete project	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
02	Ability to develop ideas and convert them to product	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
03	Ability to make prototype and analyze	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.
04	Ability to resolve real-time problems with available resources	Chalk & Talk, Presentations, Activities, Video shows, case studies, simulation, doing project/product etc.

8.0 Books Used and Recommended to Students

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. HassoPlattner, ChristophMeinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
4. IdrisMootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

References

5. YousefHaik 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).

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

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

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

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

10.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	Elsevier	https://www.journals.elsevier.com
2	Journal of Composite Materials	http://journals.sagepub.com
3	Journal of Manufacturing Science and Engineering	http://manufacturingscience.asmedigitalcollection.asme.org
4	International Journal of Renewable Energy Research (IJRER)	http://www.ijrer.org

11.0 Examination Note

Methods of CIE need to be defined topic wise i.e.- Tests, MCQ, Quizzes, Seminar or micro project/Course Project, Term Paper)
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The student has to obtain a minimum of 35% of maximum marks in SEE and a minimum of 40% of maximum marks in CIE. Semester End Exam (SEE) is conducted for 100 marks (3 hours' duration) and scaled down to 50 marks. Based on this grading will be awarded.
The student has to score 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.

12.0 Course Delivery Plan

Module	Content of Lecturer	Delivery	Cumulative Coverage

1	Understanding Design thinking: Shared model in team-based design – Theory and practice in Design thinking – Explore presentation signers across globe – MVP or Prototyping	Chalk & Talk & Video of live examples	20%
2	Tools for Design Thinking: Real-Time design interaction capture and analysis – Enabling efficient collaboration in digital space – Empathy for design – Collaboration in distributed Design	Chalk & Talk, Case Studies & Video of live examples	40%
3	Design Thinking in IT: Design Thinking to Business Process modeling – Agile in Virtual collaboration environment – Scenario based Prototyping	Case Studies & Simulation	60%
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.	Business Models, Presentation and Live Projects	80%
5	Design thinking workshop: Design Thinking Work shop Empathize, Design, Ideate, Prototype and Test	Presentation	100%

13.0 Continuous Internal Evaluation (CIE)

Module	CIE Method	Marks	Conduction
1,2,3,4 &5	3 IA Tests Duration:1 hour	Conduction for 50 marks & reduced to 20 marks	I IA-5th week, II IA-10th week & III IA-15th week
	2 Assignments	Each assignment evaluation for 25 marks & average of all assignments shall be reduced to 10 marks	I Asignment-4thweek &II Assignment-9th week
	Report writing or presentation or Seminar or GD	Each activity shall be evaluated for 50 marks with proper rubrics and average of all evaluations shall be reduced to 20 marks	13th week

Module	Topic	CIE Method
1	Understanding Design Thinking	MCQ/Term paper
2	Tools for Design Thinking	MCQ/Case Study Presentation Evaluation/Simulation Evaluation
3	Design Thinking in IT	MCQ/Case Study Presentation Evaluation/Simulation Evaluation
4	DT for Strategic Innovations	Seminar presentation on design/ micro-project on design thinking
5	Design Thinking Workshop	Workshop presentation/Course project

13.0 Semester End Examination (SEE)

VisvesvarayaTechnological University will conduct the MCQ SEE for maximum for 50 marks. There will be 50 questions carrying 01mark each. The duration of the SEE will be 1hour.

15.0 QUESTION BANK (to be prepare)

16.0 University Result

VTU Examination	S+	S	A	B	C	D	E	F	% Passing
Dec.21-Jan.22 VTU SEE									100
FEB-MARCH 2023 VTU SEE									100

Prepared by	Checked by		
Dr.S.N.Topannavar	Module Coordinator	HOD	Principal

Subject Title	Balake Kannada		
Subject Code	BKBKK207	CIE Marks	50
		SEE Marks	50
Number of Lecture Hrs / Week	1	Total Marks	100
Total Number of Lecture Hrs	15	Exam Hours	1 H
Credits: 1			

FACULTY DETAILS:		
Name: Smt. B S KOTEPPAGOL	Designation: Asst. Professor	Experience: 05
No. of times course taught:5	Specialization: MA IN KANNADA	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
1			

2.0 Course Objectives

1. To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.
2. To enable learners to Listen and understand the Kannada language properly.
3. To speak, read and write Kannada language as per requirement.
4. To train the learners for correct and polite conservation

3.0 Course Outcomes

At the end of the Course, The Students will be able

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

4.0 Course Content

Module-1

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

Module-2

1. ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು
   Possessive forms of nouns, dubitive question and Relative nouns
2. ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು
   Qualitative, Quantitative and Colour Adjectives, Numerals.
3. ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ)
   Predictive Forms, Locative Case

Module-3

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

Module-4

1. ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು
   Permission, Commands, encouraging and Urging words (Imperative words and sentences)
2. ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು
   Accusative Cases and Potential Forms used in General Communication
3. "ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು
   Helping Verbs"iru and iralla", Corresponding Future and Negation Verbs
4. ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ
   Comparitive, Relationship, Identification and Negation Words

Module-5

1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು
   ifferent types of forms of Tense, Time and Verbs

2. ದ್,-ತ್,-ತು,- ಇತು, - ಆಗಿ, -ಅಲ್ಲ,-ಗ್,-ಕ್, ಇದೆ, ಕ್ರಿಯಾ ಪ್ರತ್ಯಯಗಳೊಂದಿಗೆ ಭೂತ, ಭವಿಷ್ಯತ್ ಮತ್ತು ವರ್ತಮಾನ ಕಾಲ ವಾಕ್ಯ ರಚನೆ - Formation of Past, Future and Present Tense Sentences with Verb Forms
3. Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation

5.0 Relevance to future subjects

Sl.No.	Semester	Subject	Topics
			-
			-

6.0 Relevance to Real World

Sl.No	Real World Mapping

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details

8.0 Books Used and Recommended to Students

Text Books

Balake Kannada

Reference books

1. ಸಂಕ್ಷಿಪ್ತ ಕನ್ನಡ ನಿಘಂಟು (ಪರಿಷತ್ತು), ಕನ್ನಡ ಸಾಹಿತ್ಯ ಪರಿಷತ್, ಬೆಂಗಳೂರು
2. ಕನ್ನಡ ಕಲಿ ಪಠ್ಯಪುಸ್ತಕ – ಲಿಂಗದೇವರು ಹಳೆಮನೆ, ಪ್ರಸಾರಾಂಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/ Animation/ Videos Recommended

Website and Internet Contents References

10.0 Magazines/Journals Used and Recommended to Students

Sl. No	Magazines/Journals	Website
3		

11.0 Examination Note

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 25 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 25 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 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.

12.0 Course Delivery Plan

Module	Lecture No./Practical Session	Content of Lecture	% of Portion
Module-1	L-1	Introduction, Necessity of learning a local language. Methods to learn the Kannada language.	20
	L-2	Easy learning of a Kannada Language: A few tips. Hints for correct and polite conservation, Listening and Speaking Activities, Key to Transcription.	
	L-3	ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು Personal Pronouns, Possessive Forms, Interrogative words.	
Module-2	L-1	ನಾಮಪದಗಳ ಸಂಬಂಧಾರ್ಥಕ ರೂಪಗಳು, ಸಂದೇಹಾಸ್ಪದ ಪ್ರಶ್ನೆಗಳು ಮತ್ತು ಸಂಬಂಧವಾಚಕ ನಾಮಪದಗಳು Possessive forms of nouns, dubitive question and Relative nouns	20
	L-2	ಗುಣ, ಪರಿಮಾಣ ಮತ್ತು ವರ್ಣಬಣ್ಣ ವಿಶೇಷಣಗಳು, ಸಂಖ್ಯಾವಾಚಕಗಳು Qualitative, Quantitative and Colour Adjectives, Numerals	
	L-3	ಕಾರಕ ರೂಪಗಳು ಮತ್ತು ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು - ಸಪ್ತಮಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯ - (ಆ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case	
Module-3	L-1	ಚತುರ್ಥಿ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯದ ಬಳಕೆ ಮತ್ತು ಸಂಖ್ಯಾವಾಚಕಗಳು -Dative Cases, and Numerals	20
	L-2	ಸಂಖ್ಯಾಗುಣವಾಚಕಗಳು ಮತ್ತು ಬಹುವಚನ ನಾಮರೂಪಗಳು - Ordinal numerals and Plural markers	
	L-3	ನ್ಯೂನ / ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾಪದಗಳು ಮತ್ತು ವರ್ಣ ಗುಣವಾಚಕಗಳು Defective / Negative Verbs and Colour Adjectives	
Module-4	L-1	ಅಪ್ಪಣೆ / ಒಪ್ಪಿಗೆ, ನಿರ್ದೇಶನ, ಪ್ರೋತ್ಸಾಹ ಮತು ಒತ್ತಾಯ ಆರ್ಥರೂಪ ಪದಗಳು ಮತ್ತು ವಾಕ್ಯಗಳು Permission, Commands, encouraging and Urging words (Imperative words and sentences)	20
	L-2	ಸಾಮಾನ್ಯ ಸಂಭಾಷಣೆಗಳಲ್ಲಿ ದ್ವಿತೀಯ ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ಸಂಭವನೀಯ ಪ್ರಕಾರಗಳು Accusative Cases and Potential Forms used in General Communication	

	L-2	."ಇರು ಮತ್ತು ಇರಲ್ಲ" ಸಹಾಯಕ ಕ್ರಿಯಾಪದಗಳು, ಸಂಭಾವ್ಯಸೂಚಕ ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಕ್ರಿಯಾ ಪದಗಳು Helping Verbs"iru and iralla", Corresponding Future and Negation Verbs	
	L-3	ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ Comparitive, Relationship, Identification and Negation Words	
Module-5	L-1	ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು Different types of forms of Tense, Time and Verbs	20
	L-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	
	L-3	Kannada Vocabulary List : ಸಂಭಾಷಣೆಯಲ್ಲಿ ದಿನೋಪಯೋಗಿ ಕನ್ನಡ ಪದಗಳು - Kannada Words in Conversation	

13.0 QUESTION BANK

Note: Fill in the blankto translating the given English word to Kannada word.

Q.1) We_____
a) avaru b)ivaru c)avlud d)naavu

Q.2) She_____
a) avanu b)adu c)avaLu d)idu

Q.3) It_____
a) naavu b)adu c)niivu d)ivaru

Q.4) You_____
a) naavu b)adu c)niivu d)ivaru

Q.5) They_____
a) avara b)avaru c)avarind d)ivaru

Note: Substitute the correct word to the under lined words in the following sentences.

Q.6) avaru huuDugar iddare
a) huDugaru b) huDuga c) huuDaga d) huDuug

Q.7) avaLu huDuugi iddaLe
a) huuDugi b) huDugi c) Girl d) Lady

Q.8) adu mani iruttade
a) home b) house c) mane d) college

Q.9) Santosh kaalejige huguttare
a) hoguttaLe b) baruttane c) hoguttane d) goining

Q.10) Ravi haasTelanalli iruttani
a) iruttaLe b) iruvaru c) iddare d) iruttane

Q.11) tande_____
a) father b) grand father c)mother d) brother

Q.12) tangi_____
a) small sister b) sister c) yonger sister d) elder sister

Note:Write the English word for the given Kannada word.
Q.13) tamma_____
a) brother b) big brother c) smallbrother d) younger brother
Q.14) snehita_____
a) geLeya b) friend c) snehite d) best friend
Q.15) shikshaka_____
a) teacher b) lecturer c) Professor d) Pricipal

Note:Fill in the blank choosing the right word from the group given below.
Q.16) avaLa_____ eenu?
a) hesaru b) hasar c) hasiru d) name
Q.17) manege_____ baa.
a) early b) late c) beega d) taDavagi
Q.18) niinuiiga_____hogidde?
a) where b) there c) ellege d) ellige
Q.19) Ravi _____ankagaLannu paDediddane.
a) heccu b) more c) hecu d) highest
Q.20) niinu snehitarige ____tegedukonDu baa.
a) haNNugaLannu b) haNNagalannu c) hannugalannu d) haNugalannu

Note:Translate the following Kannada sentences into English.
Q.21) idubyaga ide.
a) It is a bag b) It is a book c) It is a pen d) It is a compass
Q.22) nimma hesaru eenu?
a) What is it's name? b) What is your name?
c) What is that's name? d) What is his name?
Q.23) niinu haastelage beega baa.
a) you come to hostel early. b) you came to hostel early
c) you must come to hostel early d) you come fast to hostel
Q.24) nanage gaNita pustaka beeku.
a) I need not mathematics book b) I want mathematics book
c) I wanted mathematics book d) I need mathematics book
Q.25) yaaru baruttare ?
a) Who will come? b) Who will be come?
c) Who will be coming? d) Who is coming?

Note: Translate the following English words into Kannada words.
Q.26) Friend
a) snehita b) tamma c) tangi d) brother
Q.27) Home
a) college b) mane c) house d) room
Q.28) Who
a) yaruu b) yaarinda c) yaaravaru d) yaaru
Q.29) When
a) yaavaaga b) yaavadu c) yandu d) yandininda

Q.30) What
a) enu b) yantu c) yantadu d) eenu

Note: Translate the following English sentence into Kannada .
Q.31) May I go there.
a) naanu allige hogabahude b) naanualligehoguttene
c) naan uallige hogalu sadhyavide d) naan uallige hoguvaniddene
Q.32) I am writing an assignment.
a) naanu assignment bareyuvaniddene. b) naanu assignment barediddene.
c) naanu assignment bareyuttene. d) naanu assignment bareyuttiddene.

Q.33) Who told him?
a) avanige yaaru heLidaru? b) avanige yaaru heLiddare
c) avanige yaaru heLuttare d) avanige yaaru heLabahudu
Q.34) He is my friend.
a) avanu nanna snehita iddane b) avanu nanna tamma iddane
c) avaLu nanna tangi iddaLe d) avaLu nanna akka iddaLe
Q.35) She is girl
a) avaLu gruhiNi iddaLe b) avaLu huDugi iddaLe
c) avanu huDuga iddane d) avaLu tangi iddaLe

Note: Change the word as per model given. Example:avana +adu =avanadu.
Q.36) chikka
a) chikkadu b) chakkadu c) chukkadu d) chokkadu
Q.37) doDDa
a) doDDadu b) doDDudu c) doDDada d) duDDudu
Q.38) oLLeya
a) oLLayadu b) oLLeeyadu c) oLeyadu d) oLLeyadu
Q.39) keTTa
a) keTTavanu b) keTTadu c) keTadu d) keTudu
Q.40) keLagina
a) melinadu b) hindinadu c) keLaginadu d) mundinadu

Note : Transform the following words of Kannada as per the given model. Example:kaTTe+-alli kaTTeyalli
Q.41) mane
a) maniyalli b) maneyolage c) maneyalli d) manegaLalli
Q.42) toTa
a) toTadalli b)holadalli c) toTadoLage d) huudoTadalli
Q.43) bavi
a) bavigaLalli b) baviyalli c) baviyoLage d) bavinalli
Q.44) byagu
a) byaginoLage b) byaginalli c) bogiyalli d) bogiyoLage
Q.45) uuru
a) uuralli b) uurinoLage c) urinalli d) uriinalli

Note : Transform the following words to Kannada as per the given model Example: -mane-manege
Q.46) uuru

a) uurige b) uurinoLage c) uurivarige d) uroTTige

Q.47) avanu
a) avanige b) avarige c) ivarige d) avaLige

Q.48) akka
a) akkanavarige b) akkange c) avakkage d) akkanige

Q.49) naanu_____
a) nanage b) nimage c) avarige d) ivarige

Q.50) amma_____
a) ammanavarige b) ammanige c) ammaLige d) ammavarige

Prepared by Smt.B.S.Koteppagol	1st year co-ordinator	Principal

Subject Title	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Subject Code	BKSKK207	CIE Marks	50
		SEE Marks	50
Number of Lecture Hrs / Week	1	Total Marks	100
Total Number of Lecture Hrs	15	Exam Hours	1 H
Credits: 1			

FACULTY DETAILS:		
Name: Smt. B S KOTEPPAGOL	Designation: Asst. Professor	Experience: 06
No. of times course taught:7	Specialization: MA IN KANNADA	

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
1	Kannada medium students	1-10 Standard	kannada Language

2.0 Course Objectives

1. ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸಿ ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
3. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
4. ಕನ್ನಡ ಶಬ್ದಸಂಪತ್ತಿನ ಪರಿಚಯ ಮತ್ತು ಕನ್ನಡ ಭಾಷೆಯ ಬಳಕೆ ಹಾಗೂ ಕನ್ನಡದಲ್ಲಿ ಪತ್ರ ವ್ಯವಹಾರವನ್ನು ತಿಳಿಸಿಕೊಡುವುದು.

3.0 Course Outcomes

1. ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ.
3. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.
4. ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.

4.0 ಅಣಧಿಜ ಅಂಟಿಣಜಟಿಣ

ಘಟಕ -1 ಲೇಖನಗಳು

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

ಘಟಕ -2 ಆಧುನಿಕ ಪೂರ್ವದ ಕಾವ್ಯ ಭಾಗ

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

ಘಟಕ -3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ

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

ಘಟಕ -4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ

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

ಘಟಕ -5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

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

5.0 Relevance to future subjects

Sl.No.	Semester	Subject	Topics
			-
			-

6.0 Relevance to Real World

Sl.No	Real World Mapping

7.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details

8.0 Books Used and Recommended to Students

Text Books
1.ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಸಮೀಕ್ಷೆ – ಎಚ್ ತಿಪ್ಪೇರುದ್ರಸ್ವಾಮಿ.
2. ಕರ್ನಾಟಕ ಗತವೈಭವ – ಆಲೂರ ವೆಂಕಟರಾಯ
3. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ರಂ. ಶ್ರೀ ಮುಗಳಿ
4. ಕನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ತ.ಸು. ಶಾಮರಾಯ
5. ಹೊಸಗನ್ನಡ ಸಾಹಿತ್ಯ ಚರಿತ್ರೆ – ಎಲ್. ಎಸ್. ಶೇಷಗಿರಿರಾವ್.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/ Animation/ Videos Recommended

Website and Internet Contents References

10.0 Magazines/Journals Used and Recommended to Students

Sl. No	Magazines/Journals	Website

11.0 Examination Note

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 25 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 25 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 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.

12.0 Course Delivery Plan

Module	Lecture No./Practical Session	Content of Lecture	% of Portion
ಘಟಕ –1	L-1	ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ	20
	L-2	ಕರ್ನಾಟಕದ ಏಕೀಕರಣ : ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ	
	L-3	ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ	
ಘಟಕ –2	L-1	ವಚನಗಳು : ಬಸವಣ್ಣ, ಅಕ್ಕಮಹಾದೇವಿ, ಅಲ್ಲಮಪ್ರಭು, ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯ, ಜೇಡರದಾಸಿಮಯ್ಯ, ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ	20
	L-2	ಕೀರ್ತನೆಗಳು : ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ,ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೇ	
	L-3	ತತ್ವಪದಗಳು : ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು - ಶಿಶುನಾಳ ಶರೀಫ	
ಘಟಕ –3	L-1	ಡಿವಿಜಿ ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಆಯ್ದ ಕೆಲವು ಭಾಗಗಳು	20
	L-2	ಕುರುಡು ಕಾಂಚಾಣ : ದಾ.ರಾ. ಬೇಂದ್ರೆ	
	L-3	ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು	
ಘಟಕ -4	L-1	ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ – ಎ. ಎನ್. ಮೂರ್ತಿರಾವ್	20
	L-2	ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ ಎನ್ ಮೂರ್ತಿರಾವ್	
	L-3	ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ	
ಘಟಕ -5	L-1	ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ	20
	L-2	ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ	
	L-3	ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	

13.0 QUESTION BANK

ಘಟಕ -1

1) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ:

1) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಲೇಖನದ ಲೇಖಕರು ಯಾರು?
2) "ಕಬ್ಬಿಗರ ಕಾವ್ಯ" ಕಾವ್ಯ ರಚಿಸಿದ ಕವಿ ಹೆಸರು ಏನು?
3) ಕನ್ನಡದ ಮೊದಲ ಉಪಲಬ್ಧ ಗ್ರಂಥ ಯಾವುದು?
4) ಮಹಾಸತಿ ಎಂದರೆ ಯಾರು?
5) ವಿಜಯನಗರದ ಪ್ರಸಿದ್ಧ ದೊರೆ ಯಾರು ?
6) ಪಂಪ ರಚಿಸಿದ ಕೃತಿಗಳನ್ನು ಹೆಸರಿಸಿ?
7) "ಭರತೇಶ ವೈಭವ' ರಚಿಸಿದ ಕವಿ ಯಾರು?
8) ಹಂಪ ನಾಗರಾಜಯ್ಯ ಜನಿಸಿದ ಊರು ಯವುದು?
9) ಕವಿರಾಜಮಾರ್ಗದ ಕರ್ತೃ ಯಾರು?
10) ಹಂಪ ನಾಗರಾಜಯ್ಯ ಪಡೆದ ಕನ್ನಡದ ಪ್ರತಿಷ್ಠಿತ ಪ್ರಶಸ್ತಿ ಯಾವುದು?

2. ಕರ್ನಾಟಕದ ಏಕೀಕರಣ ; ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ:

1. ಕರ್ನಾಟಕ ಏಕೀಕರಣ ; ಒಂದು ಅಪೂರ್ವ ಚರಿತ್ರೆ. ಇದರ ಲೇಖಕರ ಹೆಸರೇನು?
2. ಪ್ರೊ.. ಜಿ. ವೆಂಕಟಸುಬ್ಬಯ್ಯನವರ ಜನ್ಮ ಸ್ಥಳ ಯಾವುದು?
3. 'ಇಗೊ ಕನ್ನಡ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
4. ಕರ್ನಾಟಕ ಏಕೀಕರಣ ಎಂದರೇನು?
5. ಸರ್. ಥಾಮಸ್ ಮನ್ರೋ ಯಾರು?
6. ಯಾರ ಪ್ರಯತ್ನದಿಂದ 1890ರಲ್ಲಿ ವಿದ್ಯಾವರ್ಧಕ ಸಂಘ ಸ್ಥಾಪನೆಯಾಯಿತು?
7 'ಕರ್ನಾಟಕ ಗತವೈಭವ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
8. ಕರ್ನಾಟಕ ಏಕೀಕರಣವಾದ ವರ್ಷ ಯವುದು?
9. ಮೈಸೂರ ರಾಜ್ಯಕ್ಕೆ ಕರ್ನಾಟಕವೆಂದು ನಾಮಕರಣ ಮಾಡಿದ ವರ್ಷ ಯವುದು?
10. 1955ರಲ್ಲಿ ರಾಯಚೂರಿನಲ್ಲಿ ನಡೆದ ಕನ್ನಡ ಸಾಹಿತ್ಯ ಸಮ್ಮೇಳನದ ಅಧ್ಯಕ್ಷರು ಯಾರಾಗಿದ್ದರು?

3. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ

ವಸ್ತು ನಿಷ್ಠ ಪ್ರಶ್ನೆಗಳು

1) ಜಗತ್ತಿನಲ್ಲಿ ಹೆಚ್ಚು ಮಂದಿ ಮಾತನಾಡುವ ಭಾಷೆಯೆಂಬ ನೆಲೆಯಲ್ಲಿ ಕನ್ನಡಕ್ಕೆ ಎಷ್ಟನೇ ಸ್ಥಾನ ಸಿಕ್ಕಿದೆ?
2) ಕನ್ನಡ ಭಾಷೆ ಯಾವ ಲಿಪಿಯಿಂದ ರೂಪಗೊಂಡಿದೆ?
3) ವಿನೋಬಾ ಭಾವೆಯವರು ಕನ್ನಡ ಭಾಷೆಯ ಲಿಪಿಯನ್ನು ಏನೆಂದು ಕರೆದಿದ್ದಾರೆ?
4) ಸಂವಿಧಾನದ ಎಷ್ಟನೇ ಅನುಚ್ಛೇದದ ಪ್ರಕಾರ ಆಯಾ ರಾಜ್ಯಗಳಲ್ಲಿ ಬಳಕೆಯಾಗುವ ಭಾಷೆಗಳನ್ನೇ ಆಡಳಿತ ಭಾಷೆಯೆಂದು ತೀರ್ಮಾನಿಸಲಾಗಿದೆ?

5) ಯಾವ ವರ್ಷದಲ್ಲಿ ಸಾರ್ವತ್ರಿಕವಾಗಿ ನ್ಯಾಯಾಲಯಗಳ ತೀರ್ಪಿನ ಭಾಷೆ ಕನ್ನಡವೇ ಆಗಿರಬೇಕೆಂದು ಅಂತಿಮ ಆಜ್ಞೆ ಹೊರಡಿಸಲಾಯಿತು?

ಘಟಕ -2

ಆಧುನಿಕ ಪೂರ್ವ ಕಾವ್ಯ ಭಾಗ

1. ವಚನಗಳು:

1. ಕನ್ನಡದ ಮೊದಲ ಆದ್ಯ ವಚನಕಾರ ಯಾರು?
2. ಜೇಡರ ದಾಸಿಮಯ್ಯನ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
3. ಜೇಡರ ದಾಸಿಮಯ್ಯ ಅಳಿಮನದವನ ಭಕ್ತಿಯನ್ನು ಯಾವುದಕ್ಕೆ ಹೋಲಿಸಿದ್ದಾರೆ?
4. ಅಲ್ಲಮ ಪ್ರಭುಗಳ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
5. ಮೃತ್ಯುವಿನ ಬಾಯಿಗೆ ತುತ್ತಾದವರು ಯಾರು ಎಂದು ಅಲ್ಲಮ ಪ್ರಭುಗಳು ಹೇಳಿದ್ದಾರೆ?
6. ಬಸವಣ್ಣನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
7. .ಬಸವಣ್ಣನವರು ಮರಹು ಘನವಾದರೂ ಯಾವುದನ್ನು ಕಿರಿಯದೆನ್ನಬಾರದೆಂದು ಹೇಳಿದ್ದಾರೆ?
8. ಅಕ್ಕಮಹಾದೇವಿಯ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
9. ಚನ್ನಮಲ್ಲಿಕಾರ್ಜುನ ಯಾರನ್ನು ನರಕದಲ್ಲಿಕ್ಕದೆ ಬಿಡುವುದಿಲ್ಲವೆಂದು ಅಕ್ಕಮಹಾದೇವಿ ಹೇಳಿದ್ದಾಳೆ?
10. ಆಯ್ದಕ್ಕಿ ಮಾರಯ್ಯನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
11. ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮನವರ ವಚನಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
12. ಆಯ್ದಕ್ಕಿ ಲಕ್ಕಮ್ಮ ಯಾರಿಗೆ ಬಡತನವಿಲ್ಲ ಎಂದು ಹೇಳಿದ್ದಾಳೆ?

2. ಕೀರ್ತನೆಗಳು:

1) ಪುರಂದರದಾಸರ ಕೀರ್ತನೆಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
2) 'ಅದರಿಂದೇನು ಫಲ ಇದರಿಂದೇನು ಫಲ' ಕೀರ್ತನೆ ರಚಿಸಿದ ದಾಸರ ಹೆಸರೇನು?
3) ಕನಕದಾಸರ ಕೀರ್ತನೆಗಳ ಅಂಕಿತನಾಮ ಯಾವುದು?
4)'ತಲ್ಲಣಿಸದಿರು ಕಂಡ್ಯ ತಾಳು ಮನವೆ' ಕೀರ್ತನೆ ರಚಿಸಿದ ದಾಸರ ಹೆಸರೇನು?

3. ತತ್ಪದಗಳು (ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು)

1) 'ಸಾವಿರ ಕೊಡಗಳ ಸುಟ್ಟು' ಈ ತತ್ವಪದವನ್ನು ರಚಿಸಿದವರು ಯಾರು?

ಘಟಕ -3

ಆಧುನಿಕ ಕಾವ್ಯ ಭಾಗ

1. ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ

1) ಡಿ.ವಿ.ಜಿ. ಯವರು ಎಲ್ಲಿ ಮತ್ತು ಯಾವಗ ಜನಿಸಿದರು?
2) 'ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗ' ಕೃತಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
3) ಪದ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿ
   ಹುಲ್ಲಾಗು ಬೆಟ್ಟದಡಿ, ಮನೆಗೆ _____ ಯಾಗು ।
   ಕಲ್ಲಾಗು ಕಷ್ಟಗಳ ಮಳೆಯ ವಿಧಿ ಸುರಿಯೆ ॥

   _____ ।
   ಎಲ್ಲರೊಳಗೊಂದಾಗು ಮಂಕುತಿಮ್ಮ ॥
4) ಹೊಸಚಿಗುರು ಹಳೆ ಬೇರು ಕೂಡಿರಲು _____

2. ಕುರುಡು ಕಾಂಚಾಣಾ

1) ದ. ರಾ. ಬೇಂದ್ರೆಯವರ ಪೂರ್ಣ ಹೆಸರೇನು?
2) ದ. ರಾ. ಬೇಂದ್ರೆಯವರು ಎಲ್ಲಿ ಜನಿಸಿದರು?
3) ದ. ರಾ. ಬೇಂದ್ರೆಯವರ ಕಾವ್ಯನಾಮ ಯಾವುದು?
4) ಬೇಂದ್ರೆಯವರ ಯಾವ ಕವನ ಸಂಕಲನಕ್ಕೆ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿ ಲಭಿಸಿದೆ?
5) ಕುರುಡು ಕಾಂಚಾಣಾ ಕವನವನ್ನು ಯಾವುದರಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
6) ಪದ್ಯವನ್ನು ಪೂರ್ಣಗೊಳಿಸಿ
   ಕುರುಡು ಕಾಂಚಾಣಾ ಕುಣಿಯುತಲಿತ್ತು
   _____
   ಕುರುಡು ಕಾಂಚಾಣ.

3. ಹೊಸಬಾಳಿನ ಗೀತೆ

1) ಕುವೆಂಪುರವರು ಎಲ್ಲಿ ಮತ್ತು ಯಾವಗ ಜನಿಸಿದರು?
2) ಕುವೆಂಪುರವರ ಪೂರ್ಣ ಹೆಸರೇನು?
3) ಕುಪ್ಪಳ್ಳಿ ವೆಂಕಟಪ್ಪ ಪುಟ್ಟಪ್ಪನವರ ಕಾವ್ಯನಾಮ ಯಾವುದು?
4) 'ಹೊಸಬಾಳಿನ ಗೀತೆ' ಕವನವನ್ನು ಯಾವುದರಿಂದ ಆರಿಸಿಕೊಳ್ಳಲಾಗಿದೆ?
5) 'ನೆನಪಿನ ದೋಣಿ' ಇದು ಯಾರ ಆತ್ಮ ಚರಿತ್ರೆ?
6) 'ರಾಷ್ಟ್ರಕವಿ' ಪ್ರಶಸ್ತಿ ಪಡೆದ ಕವಿ ಯಾರು?
7) ಕುವೆಂಪುರವರ ಯಾವ ಕಾವ್ಯಕ್ಕೆ ಜ್ಞಾನಪೀಠ ಪ್ರಶಸ್ತಿ ಲಭಿಸಿದೆ?
8) ಕಾನೂರು ಹೆಗ್ಗಡತಿ ಕಾದಂಬರಿಯನ್ನು ರಚಿಸಿದವರು ಯಾರು?
9) 'ರಸಋಷಿ' ಎಂದು ಕರೆಯಿಸಿಕೊಂಡ ಕವಿ ಯಾರು?

ಘಟಕ -4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ

1. ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ – ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ

ಪ್ರಶ್ನೆ 1) ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ – ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ ಲೇಖನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಎ.ಎನ್.ಮೂರ್ತಿರಾವ್‌ರ ಪೂರ್ಣ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 3) 'ಚಿತ್ರಗಳು ಪತ್ರಗಳು' ಎಂಬ ಕೃತಿಗೆ ಯಾವ ಪ್ರಶಸ್ತಿ ದೊರೆತಿದೆ?
ಪ್ರಶ್ನೆ 4) 'ಸಂಜೆ ಗಣ್ಣಿನ ಹಿನ್ನೋಟ' ಆತ್ಮಚರಿತ್ರೆ ಕೃತಿ ಬರೆದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 5) 'ಕೃಷ್ಣರಾಜಸಾಗರ ಕಣ್ಣಂಬಾಡಿ ಆಣೆಕಟ್ಟನ್ನು ಕಟ್ಟಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 6) ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಯಾವ ರಾಜ್ಯ ಮನೆತನದಲ್ಲಿ ದಿವಾನರಾಗಿ ಕೆಲಸ ಮಾಡಿದರು?
ಪ್ರಶ್ನೆ 7) ಮೈಸೂರು ದಿವಾನರ ಹುದ್ದೆಗೆ ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ರಾಜಿನಾಮೆ ನೀಡಲು ಕಾರಣವಾದ ವರದಿ
ಪ್ರಶ್ನೆ 8) ಸರ್. ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರ ಹುಟ್ಟೂರು ಯಾವುದು?
ಪ್ರಶ್ನೆ 9) ಸರ್.ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರು ಪ್ರಯಾಣ ಹೊರಟ್ಟಿದ್ದಾಗ ಅವರ ಸೂಟ್ಕೇಸನಲ್ಲಿ ಯಾವ ಪುಸ್ತಕ ಇರುತಿತ್ತು?
ಪ್ರಶ್ನೆ 10) ಎಂ.ವಿಶ್ವೇಶ್ವರಯ್ಯನವರಿಗೆ 'ಸರ್' ಪದವಿ ನೀಡಿ ಗೌರವಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 11) ನಾಲ್ವಡಿ ಕೃಷ್ಣರಾಜ ಒಡೆಯರು ನೇಮಿಸಿದ ಆಯೋಗ ಯಾವುದು?
ಪ್ರಶ್ನೆ 12) ಮಂಡ್ಯ ಜಿಲ್ಲೆಯಲ್ಲಿ ಅನ್ನಬ್ರಹ್ಮಣ ಅವತಾರ ಮಾಡಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 13) ಭದ್ರಾವತಿ ಕಬ್ಬಿನ ಮತ್ತು ಉಕ್ಕಿನ ಕಾರ್ಖಾನೆ ನಿರ್ಮಿಸಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 14) ಕೈಗಾರೀಕರಣ ಆಗದೆ ಇದ್ದರೆ ಭವಿಷ್ಯದ ಭಾರತಕ್ಕೆ ಮತ್ತು ನಮ್ಮ ನಾಡು ಕರ್ನಾಟಕಕ್ಕೆ ಉಜ್ವಲ ಭವಿಷ್ಯವಿಲ್ಲ ಎಂಬ ಮಾತನ್ನು ಹೇಳಿದವರು ಯಾರು?
ಪ್ರಶ್ನೆ 15) ಕೈಗಾರಿಕೆಗಳನ್ನು ಬೆಳೆಸದಿದ್ದರೆ ಭಾರತಕ್ಕೆ ಉಳಿಗಾಲವಿಲ್ಲ ಎಂದು ಮನಗಂಡವರು ಯಾರು?
ಪ್ರಶ್ನೆ 16) 'ಭಾರತ ರತ್ನ' ಪ್ರಶಸ್ತಿ ಪಡೆದ ಕನ್ನಡದ ಮೊದಲ ವ್ಯಕ್ತಿ ಯಾರು?

2. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ

ಪ್ರಶ್ನೆ 1) ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ ಲೇಖನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಭಾರತೀಯ ಕರಕುಶಲ ಕಲೆಗಳಿಗೆ ಯಾವ ಕಾಲದಿಂದ ಅಪಾರ ಬೇಡಿಕೆ ಇದೆ?
ಪ್ರಶ್ನೆ 3) ಭಾರತದಿಂದ ರಫ್ತಾಗುತ್ತಿದ್ದ ವಿವಿಧ ಬಗೆಯ ಕರಕುಶಲ ವಸ್ತುಗಳ ಬಗ್ಗೆ ವಿದೇಶಿ ಬರಹಗಳಲ್ಲಿ ಪ್ರಸ್ತಾಪಿಸಿರುವ ಬರಹಗಾರರುಗಳು ಯಾರು?
ಪ್ರಶ್ನೆ 4) ಭಾರತದಲ್ಲಿ ಬೇರೆ ಬೇರೆ ಬಣ್ಣಗಳನ್ನು ನೀಡುವ ಸುಮಾರು ಎಷ್ಟು ಗಿಡಗಳಿವೆ?

ಘಟಕ -5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ

1. ಯುಗಾದಿ

ಪ್ರಶ್ನೆ 1) ಯುಗಾದಿ ಕಥೆಯನ್ನು ಬರೆದ ಕಥೆಗಾರರ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 2) ವಸುಧೇಂದ್ರ ಕಥೆಗಾರರು ಎಲ್ಲಿ ಜನಿಸಿದರು?
ಪ್ರಶ್ನೆ 3) ಯುಗಾದಿ ಕಥೆಯಲ್ಲಿಯ ಎರಡು ಮುಖ್ಯ ಪಾತ್ರಗಳು ಯಾವುವು?

ಪ್ರಶ್ನೆ 4) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ಹೆಂಡತಿಯ ಹಸರೇನು?
ಪ್ರಶ್ನೆ 5) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ಸ್ನೇಹಿತನ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 6) ಪ್ರಹ್ಲಾದ ಯಾವ ಕಂಪನಿಯಲ್ಲಿ ಕೆಲಸ ಮಾಡುತ್ತಿದ್ದ?
ಪ್ರಶ್ನೆ 7) ಪ್ರಹ್ಲಾದನ ಪತ್ನಿಯ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 8) 'ರೂಢಿಯನ್ನು ಕಟ್ಟುವುದು ಕಷ್ಟ ; ಮುರಿಯುವುದೂ ಇನ್ನೂ ಕಷ್ಟೆ ; ಮರೆಯುವುದಂತೂ ಇನ್ನೂ ಕಷ್ಟ ! ಈ ಮಾತು ಯಾವ ಕಥೆಯಲ್ಲಿ ಬಂದಿದೆ?
ಪ್ರಶ್ನೆ 9) ಗೋಪಣ್ಣ ಮಾಸ್ತರರ ವಿದ್ಯಾರ್ಥಿನಿಯ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 10) ಕಾಸಿಂಸಾಬನ ಮಗ ಯಾರು? ಇಸ್ಮಾಯಿಲ್.

2. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ

ಪ್ರಶ್ನೆ 1) ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ_ಪ್ರವಾಸ ಕಥನವನ್ನು ಬರೆದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 2) ಹಂಪಿ ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಪತಿಯಾಗಿ ಸೇವೆ ಸಲ್ಲಿಸಿದ ಲೇಖಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 3) ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ_ಪ್ರವಾಸ ಕಥನವನ್ನು ಯಾವ ಪ್ರವಾಸ ಕಥನ ಕೃತಿಯಿಂದ ಆಯ್ದುಕೊಳ್ಳಲಾಗಿದೆ?
ಪ್ರಶ್ನೆ 4) ಜಾನಪದ ಅಕಾಡೆಮಿಯ ಅಧ್ಯಕ್ಷರು ಯಾರು?
ಪ್ರಶ್ನೆ 5) ಸಂಗೀತ ಪುರವು ಈ ಹಿಂದೆ ಯಾರ ಊರಾಗಿತ್ತು?
ಪ್ರಶ್ನೆ 6) ನಾಗವಳ್ಳಿ ಮತ್ತು ಹಾಡುವಳ್ಳಿಗಳ ಸುತ್ತಮುತ್ತಲಿನ ದಟ್ಟ ಕಾಡಿನ ಒಡಲೊಳಗೆ ವಾಸವಾಗಿರುವ ಜನಾಂಗದ ಹೆಸರೆನು?
ಪ್ರಶ್ನೆ 7) ಲೇಖಕರ ಗುಂಪಿನ ಮಾರ್ಗದರ್ಶಕರು ಯಾರು?
ಪ್ರಶ್ನೆ 8) ಮೆಗಾನೆ ಗ್ರಾಮದಲ್ಲಿ ವಾಸವಾಗಿರುವ ಬುಡಕಟ್ಟು ಜನಾಂಗದ ಹೆಸರೇನು?
ಪ್ರಶ್ನೆ 9) ಕುಣಬಿ ಜನಾಂಗದವರು ಮೂಲತ; ಯಾವ ರಾಜ್ಯದ ಹಿನ್ನೆಲೆಯನ್ನು ಹೊಂದಿದ್ದಾರೆ?

ಪ್ರಶ್ನೆ 10) ಕುಣಬಿ ಜನಾಂಗದವರ ಮುಖ್ಯವಾದ ಹಬ್ಬ ಯಾವುದು?
ಪ್ರಶ್ನೆ 11) ಹಾಡಿಯ (70 ವರ್ಷದ) ಯಜಮಾನ ಯಾರು?
ಪ್ರಶ್ನೆ 12) ತಾಳಗುಪ್ಪದ ಗಿರಿಜನ ಆಶ್ರಮ ಶಾಲೆಯ ಮಾಸ್ತರ ಯಾರು?
ಪ್ರಶ್ನೆ 13) 'ಗೂಬೆ ಕೂರಿಸು' ಪದದ ಅರ್ಥ
ಪ್ರಶ್ನೆ 14) ಹಾಡಳ್ಳಿಗೆ ಹಿಂದೆ ಯಾವ ಹೆಸರಿನಿಂದ ಕರೆಯುತ್ತಿದ್ದರು?

Prepared by Smt.B.S.Koteppagol	6/3/24. 1st year co-ordinator	Principal