RV Educational Institutions ®
RV College of Engineering ®

Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi

Approved by AICTE, New Delhi

Go, change the world

Scheme & Syllabus of

III & IV Semesters (2021 Scheme)

(AS PER NEP-2020 GUIDELINES)

BACHELOR OF ENGINEERING (B.E)
IN

INDUSTRIAL ENGINEERING AND MANAGEMENT

(ACADEMIC YEAR 2022-2023)

DEPARTMENT VISION

Imparting innovation and value based education in Industrial Engineering and Management for steering organizations to global standards with an emphasis on sustainable and inclusive development.

DEPARTMENT MISSION

- To impart scientific knowledge, engineering and managerial skills for driving organizations to global excellence.
- To promote a culture of training, consultancy, research and entrepreneurship interventions among the students.
- To institute collaborative academic and research exchange programs with national and globally renowned academia, industries and other organizations.
- To establish and nurture centers of excellence in the niche areas of Industrial and Systems Engineering.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO1. Conceive, design, implement and operate integrated systems, focus on appropriate measures of performance at strategic, tactical and operational levels.

PEO2. Develop competency to adapt to changing roles for achieving organizational excellence.

PEO3. Design and develop sustainable technologies and solutions for betterment of society.

PEO4. Pursue entrepreneurial venture with a focus on creativity and innovation for developing newer products, processes and systems.

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO	Description
PSO1	Design, develop, implement and improve integrated systems that include people, materials, information, equipment and energy.
PSO2	Apply statistical and simulation tools, optimization and meta heuristics techniques for analysis of various systems leading to better decision making.
PSO3	Demonstrate the engineering relationships between the management tasks of planning, organization, leadership, control, and the human element in various sectors of economy.

Lead Society: Institute of Industrial Engineers (IIE)

ABBREVIATIONS

Sl. No.	Abbreviation	Meaning
1.	VTU	Visvesvaraya Technological University
2.	BS	Basic Sciences
3.	CIE	Continuous Internal Evaluation
4.	SEE	Semester End Examination
5.	PE	Professional Core Elective
6.	GE	Global Elective
7.	HSS	Humanities and Social Sciences
8.	PY	Physics
9.	CY	Chemistry
10.	MA	Mathematics
11.	AS	Aerospace Engineering
12.	AI & ML	Artificial Intelligence & Machine Learning
13.	BT	Biotechnology
14.	CH	Chemical Engineering
15.	CS	Computer Science & Engineering
16.	CV	Civil Engineering
17.	EC	Electronics & Communication Engineering
18.	EE	Electrical & Electronics Engineering
19.	EI	Electronics & Instrumentation Engineering
20.	ET	Electronics & Telecommunication Engineering
21.	IM	Industrial Engineering & Management
22.	IS	Information Science & Engineering
23.	ME	Mechanical Engineering

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Bachelor of Engineering in

INDUSTRIAL ENGINEERING AND MANAGEMENT

III SEMESTER

Sl. No.	Course Code	Course Title	Credit Allocation				BoS	Category	CIE Duration (H)	Max Marks CIE		SEE Duration (H)	Max Marks SEE	
			L	T	P	Total				Theory	Lab		Theory	Lab
1	21MA31C	Integral Transforms, Optimization And Numerical Techniques	3	1	0	**4**	MA	Theory	1.5	**100**	--	**3**	**100**	--
2	21IM32	Mechanics of Materials	3	0	1	**4**	IM	Theory+Lab	1.5	**100**	**50**	**3**	**100**	**50**
3	21IM33	Work System Design	3	0	1	**4**	IM	Theory+Lab	1.5	**100**	**50**	**3**	**100**	**50**
4	21IM34	Manufacturing Processes	3	0	1	**4**	IM	Theory+Lab	1.5	**100**	**50**	**3**	**100**	**50**
5	21DMA37	Bridge Course Mathematics	2 (A)	0	0	**Audit**	MA	Theory	1	**100**	--	--	--	--
6	21IM39	Design Thinking Lab	0	0	2	**2**	IM	Lab	1	--	50	2	--	50
7	21IMI310	Summer Internship - I	0	0	1	**1**	IM	Internship	1	--	**50**	**2**	--	**50**
						19								

* Summer Internship-1 will be done after the II sem for 03 Weeks

*ENGINEERING MATHEMATICS - III			
Sl.No	**COURSE TITLE**	**COURSE CODE**	**BRANCHES**
1	Linear Algebra, Laplace Transform and Combinatorics	21MA31A	CS,IS & AI
2	Discrete and Integral Transforms	21MA31B	EC,EE,EI,TE
3	Integral Transforms, Optimization And Numerical Techniques	21MA31C	AS, BT,CH,CV,IM,ME
**** MANDATORY COURSES**			
Sl.No	**COURSE TITLE**	**COURSE CODE**	**BRANCHES**
1	Environmental Technology	21BT32A	All circuit Branches
2	Biology for Engineers	21BT32B	BT & AS
3	Engineering Materials	21ME32	ME, CH & IM
***** Bridge Course: Audit course for lateral entry diploma students**			
Sl.No	**COURSE TITLE**	**COURSE CODE**	**BRANCHES**
1	Bridge Course Mathematics	21DMA37	AS,BT,CH,CV,EC,EE,EI, IM,ME&TE
2	Bridge Course C Programming	21DCS37	CS,IS & AI

Bachelor of Engineering in

INDUSTRIAL ENGINEERING AND MANAGEMENT

IV SEMESTER

Sl. No.	Course Code	Course Title	Credit Allocation				BoS	Category	CIE Duration (H)	Max Marks CIE		SEE Duration (H)	Max Marks SEE	
			L	T	P	Total				Theory	Lab		Theory	Lab
1	21IM41	Statistics for Data Analytics	3	0	1	**4**	IM	Theory+Lab	1.5	100	50	3	100	50
2	21BT42A	Environmental Technology	2	0	0	**2**	BT	Theory	1	50	--	2	50	--
3	21IM43	CAD/CAM and Robotics	3	0	1	**4**	IM	Theory+Lab	1.5	100	50	3	100	50
4	21IM44	Marketing Management	3	0	0	**3**	IM	Theory	1.5	100	--	3	100	--
5	21IM45	Financial Accounting and Management	3	1	0	4	IM	Theory	1.5	100	--	3	100	--
6	21IM4AX	Professional Elective – Group A (Local Elective)	2	0	0	**2**	IM	MOOC	1	50	--	2	50	--
7	21HS46A / 21HS46V	Kannada Course: Aadalitha Kannada / Vyavaharika Kannada	1	0	0	**1**	HSS	Theory	1	**50**	--	**2**	**50**	--
	21HSAE46 A/B/C/D/E***	Ability Enhancement course	0	0	1	**1**	HSS	Lab	1	--	**50**	**2**	--	**50**
8	21DCS47	Bridge Course: C Programming	2 (A)	1	0	**Audit**	CS	Theory	1.5	50	--	--	--	--
9	21HSU48	Universal Human Values and Professional Ethics	2	0	0	**2**	HSS	Theory	1	50	--	2	50	--
						23								

* Summer Internship-II will be done after the IV sem for 04 Weeks

*ENGINEERING MATHEMATICS - IV			
Sl.No	**COURSE TITLE**	**COURSE CODE**	**BRANCHES**
1	Graph Theory, Statistics and Probability Theory	21MA41A	CS, IS &AI
2	Linear Algebra, Statistics and Probability Theory	21MA41B	EC,EE,EI,TE
3	Engineering Mathematics -IV	21MA41C	AS, CH, CV, ME
**** MANDATORY COURSES**			
Sl.No	**COURSE TITLE**	**COURSE CODE**	**BRANCHES**
1	Engineering Materials	21EC42	EC,EE,EI,TE
2	Biology for Engineers	21BT42B	Circuit branches (CS,IS& AI)
3	Environmental Technology	21BT42A	All Non circuit branches
**** Bridge Course: Audit course for lateral entry diploma students**			
Sl.No	**COURSE TITLE**	**COURSE CODE**	**BRANCHES**
1	Bridge Course Mathematics	21DMA48	CS,IS & AI
2	Bridge Course C Programming	21DCS48	AS,BT,CH,CV,EC,EE,EI,IM,ME & TE

GROUP A: PROFESSIONAL ELECTIVES (MOOC COURSES)			
Sl. No.	**Course Code**	**Course Title**	**Duration**
1.	21IM4A1	Programming, Data Structures And Algorithms Using Python	8 Weeks
2.	21IM4A2	Foundation Course in Managerial Economics	8 Weeks
3.	21IM4A3	Mechatronics	8 Weeks
4.	21IM4A4	Mechanical Measurement systems	8 Weeks
5.	21IM4A5	Mechanics of Machining	8 Weeks
6.	21IM4A6	User-centric Computing for Human-Computer Interaction	8 Weeks
7.	21IM4A7	Data Base Management System	8 Weeks
8.	21IM4A8	Managing change in organizations	8 Weeks

# Ability Enhancement Courses			
Sl. No	**COURSE TITLE**	**COURSE CODE**	**BRANCHES**
1	National Service Scheme (NSS)	21HSAE39A	Common for all the branches. Minimum one course under any vertical is mandatory, more than one also permitted.
2	National Cadet Corps (NCC)	21HSAE39B	
3	Physical Education	21HSAE39C	
4	Music / Dance / Lights Camera Drama	21HSAE39D1 / 2 / 3	
5	Art / Photography	21HSAE39E1 / 2	

Semester: III						
INTEGRAL TRANSFORMS, OPTIMIZATION AND NUMERICAL TECHNIQUES (Theory) (Common to BT, CH, CV, IM, ME)						
Course Code	**:**	21MA31C		**CIE**	**:**	**100 Marks**
Credits: L:T:P	**:**	3:1:0		**SEE**	**:**	**100 Marks**
Total Hours	**:**	45L+15T		**SEE Duration**	**:**	**3.00 Hours**

Unit-I	**09 Hrs**
Laplace Transform: Existence and uniqueness of Laplace Transform (LT), transform of elementary functions, region of convergence. Properties - Linearity, scaling, s-domain shift, differentiation in the s-domain, division by t, differentiation and integration in the time domain. Transform of unit impulse function and periodic functions (square wave, saw-tooth wave, triangular wave, full and half wave rectifier).	
Unit – II	**09 Hrs**
Inverse Laplace Transform and solution to differential equations: Inverse Laplace transforms – properties, evaluation using different methods. Convolution theorem (without proof), problems. Applications to solve ordinary linear differential equations.	
Unit –III	**09 Hrs**
Fourier Series: Periodic function, even and odd functions. Dirichlet's conditions, Euler's formulae for Fourier series, problems on time periodic signals (square wave, half wave rectifier, saw-tooth wave and triangular wave), Fourier sine series, Fourier cosine series.	
Unit –IV	**09 Hrs**
Linear Programming: Mathematical formulation of Linear Programming Problem (LPP). Solving LPP using Graphical, Simplex and Big M methods.	
Unit –V	**09 Hrs**
Numerical Methods: Numerical solutions to partial differential equations – Finite difference approximation to derivatives, solution of Laplace equation in two dimension, heat and wave equations in one dimension (explicit methods).	

Course Outcomes: After completing the course, the students will be able to	
CO1	Illustrate the fundamental concepts of Laplace and inverse Laplace transforms, Fourier series, linear programming and numerical methods.
CO2	Apply the acquired knowledge of Laplace and inverse Laplace transforms, Fourier series, linear programming and numerical methods to solve the problems of engineering applications.
CO3	Analyze the solution of the problems using appropriate techniques of Laplace and inverse Laplace transforms, Fourier series, linear programming and numerical methods to the real world problems arising in many practical situations.
CO4	Interpret the overall knowledge of integral transforms Fourier series, linear programming and numerical methods gained to engage in life-long learning.

Reference Books	
1	Higher Engineering Mathematics, B.S. Grewal, 44th Edition, 2015, Khanna Publishers, ISBN: 978-81-933284-9-1.
2	Higher Engineering Mathematics, B.V. Ramana, 11th Edition, 2010, Tata McGraw-Hill, ISBN: 13-978-07-063419-0; ISBN: 10-0-07-063419-X.
3	Advanced Engineering Mathematics, E. Kreyszig, 10th Edition (Reprint), 2016. John Wiley & Sons, ISBN: 978-0470458365.
4	Numerical Methods for Engineers, Steven C Chapra and Raymond P Canale, McGraw Hill Publishing Co., 8th edition, 2021, ISBN: 978-9-35-460136-1.

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**50%**	**50%**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to **40 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**40**	
MATLAB	**20**	
Model presentation/ case study/ video preparation	**20**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**

Semester: III						
MECHANICS OF MATERIALS (Theory and Practice)						
Course Code	**:**	**21IM32**		**CIE**	**:**	**150 Marks**
Credits: L:T:P	**:**	**3:0:1**		**SEE**	**:**	**150 Marks**
Total Hours	**:**	**42L+ 28P**		**SEE Duration**	**:**	**3 Hours + 3 Hours**

Unit-I	**08 Hrs**
FERROUS NON-FERROUS MATERIALS COMPOSITE MATERIALSANDPOLYMERS AND ELASTOMERS:: Properties, composition and applications, 4 basic steps in material selection process, Materials selection chart ,strength to cost , density to young's Modulus	
Unit – II	**09 Hrs**
MECHANICAL BEHAVIOUROF METALS FRACTURE FATIGUE: Stress- strain diagrams to show ductile and brittle behaviour of materials, Types of fracture Types of fatigue loading with example, Mechanism of fatigue, fatigue properties, fatigue testing and SN diagram.	
Unit –III	**09 Hrs**
PHASE DIAGRAM AND FE-C EQUILIBRIUM DIAGRAM: PHASE, Gibbs phase rule, HumeRothery Rules, Binary eutectic and Eutectoid system, Iron-Iron carbide phase diagram-.Steel & Cast Iron-composition, properties and applications.	
Unit –IV	**08 Hrs**
TORSION OF CIRCULAR SHAFTS Introduction to BMD SFD Diagram, Pure torsion-torsion equation of circular shafts, Strength and stiffness, Torsional rigidity, torsional flexibility and polar modulus Power transmitted by shaft solid and hollow circular sections Tutorials	
Unit –V	**08 Hrs**
THIN AND THICK CYLINDERS Thin and thick cylinders subjected to pressure change in length, diameter and volume Lames equations (compound cylinders not included) Tutorials	

Course Outcomes: After completing the course, the students will be able to	
CO1	Understand behavior of various materials such as metals, composites and special materials
CO2	Analyze materials, composition and their phase transformation
CO3	Understand the torsion in the shafts.
CO4	Analyze the pressure change in Thick and Thin cylinder

Reference Books	
1	WilliamDCallister,"MaterialScienceandEngineering",JohnWileyandSons,19976th edition, ISBN 9812-53-052-5
2	SydneyHAvner,"IntroductiontoPhysicalMetallurgy"McGrawHillBookCompany,1994, ISBN 0-07-Y85018-6
3	Strength of Materials, Ramamrutham Dhanapath Rai Publishers, New Delhi
4	Strength of Materials, S.S BhavikattiVikas Publications House pvt. Ltd.

Laboratory Component	
Cycle-I	Cycle-II
Tension test Compression test Impact test Hardness test	Analysis of Simple & Compound bars Subjected to Axial Loads. Analysis of Trusses subjected to point loads. Analysis of Beams Subjected to concentrate & UDL loads. Analysis of Shafts subjected to twisting moment

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**50%**	**50%**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS.**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to **40 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**40**	
Case Study-based Teaching-Learning	**10**	
Open Ended Exercises	**20**	
Video based seminar (4-5 minutes per student)	**10**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**
PRACTICALS	**50**	**50**
TOTAL MARKS FOR THE COURSE	**150**	**150**

Semester: III						
WORK SYSTEMS DESIGN (Theory and Practice)						
Course Code	**:**	**21IM33**		**CIE**	**:**	**150 Marks**
Credits: L:T:P	**:**	**3:0:1**		**SEE**	**:**	**150 Marks**
Total Hours	**:**	**42L+ 28P**		**SEE Duration**	**:**	**3 Hours + 3 Hours**

Unit-I	**09 Hrs**
Introduction to Work Systems and Productivity: Pyramidal structure of work, Importance of Time, Physical work systems, work system as a field of professional practice, productivity (includes numericals). **Manual Work and Worker-Machine Systems:** Manual work systems, Worker-machine systems and Automated work systems. Numericals on cycle time analysis of manual work and worker-machine systems.	
Unit – II	**09 Hrs**
Introduction to Methods Engineering and Operations Analysis: Evolution and scope of methods engineering, Application of Methods engineering, Basic Data collection and Analysis techniques (includes case problems), Methods engineering and automation. **Charting and Diagramming techniques for Operations Analysis:** Overview, Network diagrams, Traditional IE charting and Diagramming techniques, Block diagrams and process maps. principles of motion economy and work design.	
Unit –III	**09 Hrs**
Introduction to Work Measurement: Determination of Time Standards, Prerequisites for valid time standards, Allowances in Time standards, Methods of determining time standards ranked by relative accuracy, Methods of determining time standards ranked by relative application speed. **Direct Time Study:** Procedure for standard time determination, Numericals on determining time standards for pure manual tasks and worker machine tasks. **Predetermined Motion Time Systems:** Conceptual overview of PMTS and MTM, Basic MOST, Additional versions of MOST, MOST for windows.	
Unit –IV	**08 Hrs**
Lean Production - Elimination of waste: Production of defective parts, over production and excessive inventories, other forms of waste. **Just in Time Production:** Pull system of production control, set up time reduction, stable and reliable production operations. **Autonomation:** Stopping the process, error prevention and Total productive maintenance**. Worker Involvement:** Continuous improvement, Visual management and 5S, Standardized work procedures (Conceptual Treatment only) .	
Unit –V	**08 Hrs**
Introduction to Ergonomics and Human Factors: Overview of Ergonomics, Understanding the interactions in Human –Machine system, Topic Areas in Ergonomics-Physical Ergonomics, Cognitive Ergonomics, Physical Work Environment. **Occupational Safety and Health:** Industrial Accidents and Injuries, Occupational Disorders and diseases.	

Course Outcomes: After completing the course, the students will be able to	
CO1	Recognize the relevance of industrial engineering principles for productivity improvement in the organizations.
CO2	Demonstrate the relevance of methods engineering and operational analysis approach in designing / re-designing of Lean Work Systems.
CO3	Apply engineering work measurement principles in analysing and measurement of work in work systems.
CO4	Summarize the importance of Ergonomics in the design and management of integrated work systems.

Reference Books	
1	Work Systems – The Methods, Measurement & Management of Work, Mikell P Groover, 2017, Pearson India Education, ISBN: 978-93-325-8124-1
2	Introduction to work study, George Kanawaty, 4th revised Edition, 1992, ILO, ISBN: 9221071081.
3	Motion and Time study for Lean Manufacturing, Fred E.Meyers and James R.Stewart, 3rd Edition, 2002, Prentice Hall, ISBN:0-13-031670-9.
4	Human Factors in Engineering Design, Sanders.M.S and E J Mc Cormick, 7th Edition,1993, Mc Graw – Hill, ISBN: 10 : 0070449023
e-Book	
1	Handbook of Industrial Engineering Technology and Operations Management, Third Edition, Edited by GAVRIEL SALVENDY, JOHN WILEY & SONS, INC.2001 https://pdfcoffee.com/handbook-of-industrial-engineering-3rd-editionpdf-pdf-free.html

Laboratory Component
• Exercises based on Methods Engineering • Exercises based on Work Measurement • Exercises based on Physical, Cognitive and Environmental Ergonomics

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**50%**	**50%**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS.**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to **40 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**40**	
Case Study-based Teaching-Learning	**10**	
Open Ended Exercises	**20**	
Video based seminar (4-5 minutes per student)	**10**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**
PRACTICALS	**50**	**50**
TOTAL MARKS FOR THE COURSE	**150**	**150**

Semester: III						
MANUFACTURING PROCESS (Theory and Practice)						
Course Code	**:**	**21IM34**		**CIE**	**:**	**150 Marks**
Credits: L:T:P	**:**	**3:0:1**		**SEE**	**:**	**150 Marks**
Total Hours	**:**	**42L +28P**		**SEE Duration**	**:**	**3 Hours + 3 Hours**

Unit-I	**08 Hrs**
Introduction to Manufacturing: Manufacturing Processes, Production Systems, Recent Developments in Manufacturing. **Casting Process:** Overview of Casting Technology, Heating and Pouring, Solidification and Cooling, Sand Casting, Other Expendable-Mould Casting Processes, Permanent-Mould Casting Processes, Foundry Practice	
Unit – II	**09 Hrs**
Metal Forming: Overview of Metal Forming, Hot working & cold working, principle of rolling & applications, forging operations, smith forging, drop forging, press forging, Principle of extrusion. Over view of Metal spinning and Hydro Forming techniques. **Special Casting Processes:** Shell molding, precision investment casting, die casting, centrifugal casting, and continuous casting	
Unit –III	**08 Hrs**
Welding Process: Arc Welding, Resistance Welding, Oxyfuel Gas Welding, Thermit welding, electron beam welding, Fusion-Welding Processes, Solid-State Welding, Weld Quality, Weldability, Brazing, Soldering, Adhesive Bonding, defects in welding.	
Unit –IV	**09 Hrs**
Metal Cutting Operations: Overview of Machining Technology, Theory of Chip Formation in Metal Machining, Force Relationships and the Merchant Equation, Power and Energy Relationships in Machining, Cutting Temperature, Machining and Part Geometry, Turning and Related Operations, Drilling and Related Operations, Milling, Machining Centers and Turning Centers, Tool Life, Tool Materials, Tool Geometry.	
Unit –V	**08 Hrs**
Advanced Machining Processes: Introduction, Chemical Machining, Electrochemical Machining, Electrochemical Grinding, Electrical-discharge Machining, Laser-beam Machining, Electron-beam Machining, Water-jet Machining, Abrasive-jet Machining, Hybrid Machining Systems, Subtractive processes, Additive processes and Virtual prototyping.	

Course Outcomes: After completing the course, the students will be able to	
CO1	Explain the basic principles and methodology of various manufacturing processes that are used for the production of different products.
CO2	Compare and contrast the advantages and limitations of different manufacturing processes
CO3	Identify the suitable manufacturing process to develop a product considering quality, economic and environmental aspects
CO4	Analyze the various hardware and software components used in smart manufacturing

Reference Books	
1	Fundamentals of Modern Manufacturing: Materials, Processes and Systems, Fifth Edition, Mikell P. Groover, Wiley publications, 978-1-118-231463
2	Manufacturing Technology: Foundry Forming and Welding, P.N. Rao, 2nd Edition, 1998,TMH, ISBN: 0-07-463180-2.
3	Manufacturing Processes, J.P.Kaushish, 2nd Edition, 2010, PHI Learning Pvt. Ltd, ISBN: 978-81-203-4082-4
4	Fundamentals of Metal Machining & Machine Tools, G. Boothroyd, 3rd Edition 2004, Mc Graw Hill, ISBN: 978-1-5-7442659 -3.

Laboratory Component
1. Testing of Moulding sand and Core sand Preparation of specimen and conduction of the following tests: a) Compression/ Shear /Tensile tests, Permeability test, Grain fineness test, Clay content test 2. Preparation of moulds - two box method: using split pattern. Match plate pattern & Cores. 3. Preparation of models involving the following lathe operations: Plain Turning, Taper Turning, Step Turning, Thread Cutting, Facing, Knurling, and Eccentric Turning. 4. Cutting of gear teeth using milling machine 5. Demonstration of welding experiments 6. Demonstration of surface grinding. 7. Demonstration of 3D printing 8. Simulation of manufacturing systems. 9. Experiential learning with the focus on smart manufacturing systems: Understanding hardware and software components.

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**50%**	**50%**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS.**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to **40 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**40**	
Case Study-based Teaching-Learning	**10**	
Open Ended Exercises	**20**	
Video based seminar (4-5 minutes per student)	**10**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**
PRACTICALS	**50**	**50**
TOTAL MARKS FOR THE COURSE	**150**	**150**

Semester: III						
Bridge Course: MATHEMATICS (Common to all branches)						
Course Code	**:**	**21DMA37**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Audit Course				**SEE Duration**	**:**	**2.00 Hours**

UNIT-I	**05 Hrs**
Differential Calculus: Partial derivatives – Introduction, simple problems. Total derivative, composite functions. Jacobians – simple problems.	
UNIT – II	**05 Hrs**
Vector Differentiation: Introduction, simple problems in terms of velocity and acceleration. Concepts of gradient, divergence – solenoidal vector function, curl – irrotational vector function and Laplacian, simple problems.	
UNIT –III	**06 Hrs**
Differential Equations: Higher order linear differential equations with constant coefficients, solution of homogeneous equations-Complementary functions. Non-homogeneous equations –Inverse differential operator method of finding particular integral based on input function (force function).	
Unit –IV	**05 Hrs**
Numerical Methods: Solution of algebraic and transcendental equations – Intermediate value property, Newton-Raphsonmethod. Solution of first order ordinary differential equations – Taylor series and 4^{th} order Runge- Kutta methods. Numerical integration – Simpson's $1/3^{rd}$, $3/8^{th}$ and Weddle's rules. (All methods without proof).	
Unit –V	**05 Hrs**
Multiple Integrals: Evaluation of double integrals, change of order of integration. Evaluation of triple integrals. Applications – Area, volume and mass – simple problems.	

CO1:	Illustrate the fundamental concepts of partial differentiation, double integrals, vector differentiation, solutions of higher order linear differential equations and numerical methods.
CO2:	Derive the solution by applying the acquired knowledge of total derivatives of implicit functions, Jacobians, homogeneous linear differential equations, velocity and acceleration vectors to the problems of engineering applications.
CO3:	Evaluate the solution of the problems using appropriate techniques of differential and
	integral calculus, vector differentiation, differential equations and numerical methods to the real-world problems arising in many practical situations.
CO4:	Compile the overall knowledge of differential and integral calculus, vector differentiation, differential equations and numerical methods gained to engage in life – long learning.

Reference Books	
1	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th Edition, 2015, ISBN: 978-81-933284-9-1.
2	Higher Engineering Mathematics, B.V. Ramana, 11th Edition, 2010, Tata McGraw-Hill, ISBN: 978-0-07-063419-0.
3	N.P. Bali & Manish Goyal, A Text Book of Engineering Mathematics, Lakshmi Publications, 7th Edition, 2010, ISBN: 978-81-31808320.
4	Advanced Engineering Mathematics, E. Kreyszig, 10th Edition (Reprint), 2016. John Wiley & Sons, ISBN: 978-0470458365.

Continuous Internal Evaluation (CIE); Theory (50 Marks)

CIE is executed by way of quizzes (Q) and tests (T**)**. A minimum of two quizzes are conducted and each quiz is evaluated for 10 marks adding up to 20 marks. The two tests are conducted for 30 marks each and the sum of the marks scored from two tests is reduced to 30. **Total CIE is 20(Q) +30(T)=50 Marks.**

Semester: III						
Design Thinking Lab						
Course Code	**:**	**21IM39**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**0:0:2**		**SEE**	**:**	**50 Marks**
Hours	**:**	**26P**		**SEE Duration**	**:**	**02 Hours**

Guidelines for Design Thinking Lab:

1. The Design Thinking Lab (DTL) is to be carried out by a team of two-three students.
2. Each student in a team must contribute equally in the tasks mentioned below.
3. Each group has to select a theme that will provide solutions to the challenges of societal concern. Normally three to four themes would be identified by the by the department
4. Each group should follow the stages of Empathy, Design, Ideate, prototype and Test for completion of DTL.
5. After every stage of DTL, the committee constituted by the department along with the coordinators would evaluate for CIE. The committee shall consist of respective coordinator & two senior faculty members as examiners. The evaluation will be done for each student separately.
6. The team should prepare a Digital Poster and a report should be submitted after incorporation of any modifications suggested by the evaluation committee.

The Design Thinking lab tasks would involve:

1. Carry out the detailed questionnaire to arrive at the problem of the selected theme. The empathy report shall be prepared based on the response of the stake holders.
2. For the problem identified, the team needs to give solution through thinking out of the box innovatively to complete the ideation stage of DTL
3. Once the idea of the solution is ready, detailed design has to be formulated in the Design stage considering the practical feasibility.
4. If the Design of the problem is approved, the team should implement the design and come out with prototype of the system.
5. Conduct thorough testing of all the modules in the prototype developed and carry out integrated testing.
6. Demonstrate the functioning of the prototype along with presentations of the same.
7. Prepare a Digital poster indicating all the stages of DTL separately. A Detailed project report also should be submitted covering the difficulties and challenges faced in each stage of DTL.
8. Methods of testing and validation should be clearly defined both in the Digital poster as well as the report.

The students are required to submit the Poster and the report in the prescribed format provided by the department.

Course Outcomes: After completing the course, the students will be able to	
CO 1:	Interpreting and implementing the empathy, ideate and design should be implemented by applying the concepts learnt.
CO 2:	The course will facilitate effective participation by the student in team work and development of communication and presentation skills essential for being part of any of the domains in his / her future career.
CO 3:	Appling project life cycle effectively to develop an efficient prototype.
CO 4:	Produce students who would be equipped to pursue higher studies in a specialized area or carry out research work in an industrial environment.

Scheme of Evaluation for CIE Marks: Evaluation will be carried out in three phases:

Phase	Activity	Weightage
I	Empathy, Ideate evaluation	10M
II	Design evaluation	15M
III	Prototype evaluation, Digital Poster presentation and report submission	25M
	Total	**50M**

Scheme of Evaluation for SEE Marks:

Sl. No.	Evaluation Component	Marks
1.	Written presentation of synopsis: Write up	5M
2.	Presentation/Demonstration of the project	15M
3.	Demonstration of the project	20M
4.	Viva	05M
5.	Report	05M
	Total	**50M**

Semester III							
Course Title: SUMMER INTERNSHIP-I (Practice)							
Course Code	**:**	**21IMI310**			**CIE Marks**	**:**	**50 Marks**
Credits: L:T:P	**:**	**0:0:2**			**SEE Marks**	**:**	**50 Marks**
Total Hours	**:**	**3 Weeks**			**SEE Duration**	**:**	**1 Hours**

Guidelines	**3Weeks**

1. A minimum of 1 credit of internship after I year may be counted towards B.E. degree program.
2. During II semester to III semester transition, Three weeks of internship is mandatory.
3. Internship report and certificate need to be submitted at the end of the internship to the concerned department for the evaluation.
4. Internship evaluation will be done during III semester for 1 credit in two phases.
5. Students can opt the internship with the below options:

A. **Within the respective department at RVCE (Inhouse) Departments** may offer internship opportunities to the students through the available tools so that the students come out with the solutions to the relevant societal problems that could be completed within THREE WEEKS.

B. At RVCE Centre of Excellence/Competence

RVCE hosts around 16 CENTER OP EIXCELLENCE in various domains and around 05 CENTER OP COMPETENCE. The details ofthese could be obtained by visiting the website https:/ /rvce.edu.in / rvce-center-excellence. Each center would be providing the students relevant training/internship that could be completed in three weeks.

C. At Intern Shala

Intern Shala is India's no.1 internship and training platform with 40000+ paid internships in Engineering. Students can opt any internship for the duration of three weeks by enrolling on to the platform through https: / /internsha1a.com

D. At Engineering Colleges nearby their hometown

Students who are residing out of Bangalore, should take permission from the nearing Engineering College of their hometown to do the internship. The nearby college should agree to give the certificate and the letter/email stating the name of the student along with the title of the internship held with the duration of the internship in their official letter head.

E. At Industry or Research Organizations

Students can opt for interning at the industry or research organizations like BEL, DRDO, ISRO, BHEL, etc.. through personal contacts. However, the institute/industry should provide the letter of acceptance through hard copy/email with clear mention of the title of the work assigned along with the duration and the name of the student.

Procedures for the Internship:

1. Request letter/Email from the office of respective departments should go to Places where internships are intended to be carried out with a clear mention of the duration of Three Weeks. Colleges/Industry/CoEs/CoCs will confirm the training slots and the number of seats allotted for the internship via confirmation letter/ Email.
2. Students should submit a synopsis of the proposed work to be done during internship program. Internship synopsis should be assessed or evaluated by the concerned Colleges/Industry/CoEs/CoC. Studentson joining internship at the concerned Colleges/Industry/CoEs/CoCs submit the Daily log of student's dairy from the joining date.
3. Students will submit the digital poster of the training module/project after completion of internship.
4. Training certificate to be obtained from industry.

Course Outcomes: After completing the course, the students will be able to

CO1:	Develop communication, interpersonal, critical skills, work habits and attitudes necessary for employment.
CO2:	Assess interests, abilities in their field of study, integrate theory and practice and explore career opportunities prior to graduation.
CO3:	Explore and use state of art modern engineering tools to solve societal problems with affinity towards the environment and involve in professional ethical practice.
CO4:	Compile, document and communicate effectively on the internship activities with the engineering community.

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
Phase – I	**20**	**50**
Phase- II	**30**	
TOTAL MARKS FOR THE COURSE	**50**	

Semester: IV						
STATISTICS FOR DATA ANALYTICS (Theory and Practice)						
Course Code	**:**	**21IM41**		**CIE**	**:**	**150 Marks**
Credits: L:T:P	**:**	**3:0:1**		**SEE**	**:**	**150 Marks**
Total Hours	**:**	**42L + 28P**		**SEE Duration**	**:**	**3 Hours + 3 Hours**

Unit-I	**07 Hrs**
Data Summary and Presentation: Data types, tabular and graphical displays: Stem and Leaf diagrams, Histograms, Box plots, Radar diagrams. **Concepts of Probability:** Sample spaces and Events, Interpretations of probability, Addition rules, Conditional probability, Multiplication and Total probability rules, Independence, Bayes Theorem. Numerical Problems	
Unit-II	**09 Hrs**
Concepts of Random Variables: Random Variables, Discrete and continuous random variables. Probability distributions and mass functions, Numerical Problems **Discrete Probability Distributions:** Discrete uniform, Binominal, Poisson, Geometric, Negative binomial, Hyper geometric distributions, Applications, Numerical Problems.	
Unit-III	**09 Hrs**
Continuous Probability Distributions: Continuous uniform, Normal, Normal approximations, Exponential, Erlang, Gamma, Weibull distributions, Applications, Numerical Problems. **Sampling Distribution:** Sampling distribution, Central Limit Theorem, Sampling distribution of means and derived quantities, Numerical Problems.	
Unit-IV	**07 Hrs**
Simple Linear Regression and Correlation: Empirical models, Simple Linear Regression, Properties of Least square Estimators and Estimation of variances, Common abuses of regression, Prediction of new observations, Correlation, Numerical Problems. Interpretation of graphical output from software packages such as Minitab	
Unit-V	**08 Hrs**
Statistical Inference for a single sample: Hypothesis testing, Inference on the mean of a normal population (variance known and unknown), Inference on the variance of a Normal population, Testing for Goodness of Fit, Tests of association, Numerical Problems **Interval Estimation:** Confidence Intervals on mean (variance known and unknown), and variance of a normal population	

Course Outcomes: After completing the course, the students will be able to	
CO1	Describe and report data set using data analysis, presentation and interpretation techniques to understand various phenomena in the fields of science and engineering.
CO2	Apply various statistical processing techniques to handle a set of data to estimate probabilities.
CO3	Apply an appropriate statistical tool and analyze a specific set of data to estimate and draw conclusions about population parameters
CO4	Draw inferences about population parameters and relations between variables based on analysis of sample data

References Books	
1.	Engineering Statistics, Douglas C. Montgomery, George C. Runger, Norma FarisHubele, 5th Edition, 2011, John Wiley & Sons, Inc., ISBN-13: 978- 0-470-63147-8
2.	Applied statistics and Probability for Engineers, Douglas C Montgomery, George C Runger, Wiley, 4th Edition, 2007, Asia Student Edition, ISBN: 978-81-265-2315-3.
3.	Statistics for Management, Richard I Levin, David S Rubin, 7th Edition, 1997, Prentice Hall India, ISBN: 9780134762920.
4.	Probability and Statistics for Engineers and Scientists, Walpole, Myers, Myers, Ye, 8th Edition, 2007, Pearson Education Inc., ISBN: 978-81-317-1552-9.
5.	Softwares : Microsoft Excel / Minitab / Matlab / R
6.	Online resources: a) http://172.16.44.44/nnptel.html - choose NOC: Introduction to Data Analytics(Course sponsored by Aricent) b) https://onlinecourses.nptel.ac.in/noc22_mg31/preview -Introduction to probability and Statistics c) https://newonlinecourses.science.psu.edu/statprogram/undergraduate-studies d) https://www.khanacademy.org/math/statistics-probability

Laboratory Component
• Exercises based on Descriptive statistics and Data presentation using Tableau and Excel
• Exercises based on Data Summary and Probability Distributions using R Studio
• Exercises based on Data Cleaning using R Studio.

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**50%**	**50%**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS.**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 marks adding upto 100 marks. Final test marks will be reduced to **40 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**40**	
Case Study-based Teaching-Learning	**10**	
Open Ended Exercises	**20**	
Video based seminar (4-5 minutes per student)	**10**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**
PRACTICALS	**50**	**50**
TOTAL MARKS FOR THE COURSE	**150**	**150**

Semester IV						
ENVIRONMENTAL TECHNOLOGY (Theory) (Common to all branches)						
Course Code	**:**	**21BT42A**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**26 L**		**SEE Duration**	**:**	**90 min**

Unit I	**08 Hrs**
Introduction: Climate action – Paris convention, Sustainable Developmental Goals in relation to environment, Components of environment, Ecosystem. Environmental education, Environmental acts & regulations, role of non-governmental organizations (NGOs), EMS: ISO 14000, Environmental Impact Assessment. Environmental auditing.	
Unit II	**09 Hrs**
Pollution and its remedies: Air pollution – point and non-point sources of air pollution and their controlling measures (particulate and gaseous contaminants). Noise pollution, Land pollution (sources, impacts and remedial measures), **Water management:** Advanced water treatment techniques, water conservation methods. **Waste management:** Solid waste, e-waste & biomedical waste – sources, characteristics & disposal methods. Concepts of Reduce, Reuse and Recycling of the wastes. **Waste to Energy:** Different types of Energy, Conventional sources & Non-conventional sources of energy: Solar, Hydro Electric, Wind, Nuclear, Biomass & Biogas Fossil Fuels and Hydrogen.	
Unit III	**09 Hrs**
Environmental design: Green buildings, green materials, Leadership in Energy and Environmental Design (LEED), Hydroponics, Organic Farming, Biofuels, IC engine to E mobility transition and its impacts, Carbon Credits, Carbon Foot Prints, Opportunities for Green Technology Markets, Carbon Sequestration. **Resource recovery system:** Processing techniques, Materials recovery systems, Biological conversion (composting and anaerobic digestion). Thermal conversion products (Combustion, Incineration, Gasification, Pyrolysis, use of Refuse Derived Fuels). Case studies.	

Reference Books	
1.	Shashi Chawla, A Textbook of Environmental Studies, McGraw Hill Education, 2017, ISBN: 1259006387,
2.	Richard A Schneider and Jerry A Nathanson, Basic Environmental Technology, Pearson, 6th Edition, 2022. ISBN: 9789332575134,
3.	G. Tyler Miller (Author), Scott Spoolman (Author), (2020) Environmental Science – 15th edition, Publisher: Brooks Cole, ISBN-13: 978-1305090446 ISBN-10: 130509044
4.	Howard S. Peavy, Donald R. Rowe and George Tchobanoglous. 2000. Environmental Engineering, McGraw Hill Education, First edition (1 July 2017). ISBN-10: 9351340260, ISBN-13: 978-9351340263

Course Outcomes: After completing the course, the students will be able to	
CO1:	Identify the components of environment and exemplify the detrimental impact of anthropogenic activities on the environment.
CO2:	Differentiate the various types of wastes and suggest appropriate safe technological methods to manage the waste.
CO3:	Apply different renewable energy resources for sustainable development of clean energy.
CO4:	Adopt the appropriate recovering methods to recover the essential resources from the wastes for reuse or recycling.

Experiential learning topics	
Assessment of the environment of certain big campuses/areas/industries etc, a case study	
1	Development of data sheet
2	Survey and its record
3	Identifying the problems associated
4	Provide a solution for the identified problem

Experiments to be performed	
1	Data development
2	Working model (in silico or demo model)
3	Preparing a report
4	Brainstorming of the work carried out.

Experiential learning evaluation will be evaluated based on the experiments and the preparation, presentation of the topics, equal weightage is given for experiments and theory.

IV Semester						
CAD/CAM and Robotics (Theory and Practice)						
Course Code	**:**	**21IM43**		**CIE**	**:**	**150 Marks**
Credits: L:T:P	**:**	**3:0:1**		**SEE**	**:**	**150 Marks**
Total Hours	**:**	**42L + 28P**		**SEE Duration**	**:**	**03 + 03 Hours**

Unit-I	**08 Hrs**
Fundamentals of CAD: Introduction, The CAD system definition, Reasons for implementing CAD. Design process (Shigley Model), Application of computers in design, benefits of CAD. **Principle of Interactive computer Graphics**: Graphic primitives, Line drawing algorithms, Bresenham's circle algorithm, Scan conversion, Rendering, Z buffer algorithm, Reflection, Shading	
Unit-II	**09Hrs**
Numerical & Computer control in Production system: NC procedure, NC coordinate systems, Elements & Classification of NC system, Functions & Features of CNC, DNC Concepts, and Components & Types of DNC. **NC part programming & computer aided part programming:** Manual part programming, Computer Assisted part programming, Computer assisted NC part programming, APT Language.	
Unit-III	**08 Hrs**
Automation: Introduction, Definition of Automation, Mechanization vs. Automation, Advantages of Automation, Goals of Automation, Social Issues of Automation, Low Cost Automation, Types of Automation Current Emphasis in Automation, Reasons for Automation, Reasons for not Automation, Issues for Automation in Factory Operations, Strategies for Automation.	
Unit-IV	**09 Hrs**
Robotics: Introduction, History of Robots, Definition of a Robot, Industrial Robot, Laws of Robotics Motivating Factors, Advantages and Disadvantages of Robots, Characteristics of an Industrial Robot, Components of an Industrial Robot, Comparison of the Human and Robot Manipulator, Robot Wrist and End of Arm Tools, Robot Terminology, Robotic Joints, Classification of Robots.	
Unit-V	**08Hrs**
Robotic Sensors & Robot End Effectors: Introduction, Types of Sensors in Robots, Exteroceptors or External Sensors, Introduction to End Effector, Classification of End Effectors, Grippers, Selection of Gripper, Gripping Mechanisms. **Robot Programming**: Introduction, Robot Programming, Robot Programming Techniques, On-line Programming, Lead-Through Programming, Walk-Through Programming or Teaching Off-line Programming, Overview of Robot Programming Languages, Robot Languages, Types of Robot Languages	

Laboratory Component
Part – I
• Two experiments on Simulation of Turning and milling operation on CNC Train software. • Four experiments on CNC turning & milling machines.
Part – II
• Experiments on robot programming to perform simple task

Course Outcomes: After completing the course, the students will be able to	
CO1	Describe the Elements of CNC technology and their role in CAD/CAM environment
CO2	Apply the principles of automation in manufacturing technology to improve overall organizational productivity
CO3	Summarize the different types of transfer and feeder devices used in automation.
CO4	Understanding the functionality and limitations of robotic actuators and sensors

Reference Books	
1.	CAD / CAM, Ibrahim Zeid, 1st Edition, 2000, McGraw Hill, ISBN – 0070728577.
2.	Industrial Automation and Robotics, A. K. Gupta, S. K. Arora 3rd Edition, 2013, University Science press.
3.	Automation, Production System and Computer Integrated Manufacturing, Mikell.P.Groover, 3rd Edition, 2007, PHI New Delhi, ISBN – 0132393212
4.	Computer Aided Design and Manufacturing,K. Lalit Narayan, K Mallikarjuna Rao & M.M.M Sarcar, 1st edition, 2008, PHI New Delhi, ISBN-978-81-203-3342-0

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**50%**	**50%**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS.**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to **40 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**40**	
Case Study-based Teaching-Learning	**10**	
Open Ended Exercises	**20**	
Video based seminar (4-5 minutes per student)	**10**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**
PRACTICALS	**50**	**50**
TOTAL MARKS FOR THE COURSE	**150**	**150**

Semester: IV						
MARKETING MANAGEMENT (Theory)						
Course Code	**:**	**21IM44**		**CIE Marks**	**:**	**100 Marks**
Credits: L:T:P	**:**	**3:0:0**		**SEE Marks**	**:**	**100 Marks**
Total Hours	**:**	**42L**		**SEE Duration**	**:**	**3 Hours**

UNIT-I	**07Hrs**
Introduction to Digital Marketing: Principles of Digital Marketing; Digital Marketing Channels; Tools to Create Buyer Persona; Competitor Research Tools, Website Analysis Tools, etc. **Content Marketing:** Content Marketing Concepts & Strategies; Planning, Creating, Distributing & Promoting Content; Optimize Website UX & Landing Pages; Measure Impact; Metrics & Performance; Using Content Research for Opportunities, etc.	
UNIT-II	**08Hrs**
Social Media Marketing: Introduction; Major Social Media Platforms for Marketing; Developing Data-driven Audience & Campaign Insights; Social Media for Business; Creation & Optimization of Social Media Campaigns, etc. **Search Engine Optimization:** Search Engine Optimization Fundamentals; Keywords and SEO Content Plan; SEO & Business Objectives; Writing SEO Content; On-site & off-site SEO; Optimize Organic Search Ranking, etc.	
UNIT-III	**07Hrs**
Web Analytics & Google Analytics: Google Analytics Tools; Web Analytics Tools, etc. **E-mail Marketing:** Effective E-mail Campaigns; E-mail Plan; E-mail Marketing Campaign Analysis; Measuring Conversions & keeping up, etc.	
UNIT-IV	**07Hrs**
Web Design: Web design, optimization of websites; Publishing a basic website; User-centered Design and Website Optimization; Design Principles and Website Copy; Website Metrics & Developing Insight, etc. **Mobile Marketing:** Difference between mobile advertising and marketing, utilizing mobile marketing for sales promotions, online applications, etc.	
UNIT-V	**07Hrs**
Conversion Optimization: What is AIDAS and its role; website optimization; what visitors want to see on the website; how to optimize key element and increase the effect of landing on a particular page **Digital Analytics:** Evolution of Digital Analytics, information about end-to-end customer experience, analyst's influence on business, role as a change agent, etc.	

Course Outcomes: After completing the course, the students will be able to	
CO1	Differentiate the benefits drawn by updated marketing mix from traditional marketing mix for effective marketing management there by to stay competitive in today's global market-place.
CO2	Develop an effective holistic marketing atmosphere to efficiently face the challenges in dynamically changing market.
CO3	Formulate a potential marketing plan to effectively reach the targeted market segments, by delivering the value to targeted customers through practicing sound marketing research.
CO4	Create new channels to improvise marketing to achieve and maintain competitive position in globalized market-place.

Reference Books	
1.	Marketing Management, Philip Kotler, Kevin Lane Keller, 15th Edition, 2016, Pearson, ISBN:978-93-325-5718-5
2.	Digital Marketing - Strategy, Implementation & Practice, Dave Chaffey, Fiona Ellis – Chadwick, 7th Edition, 2019, Pearson, ISBN - 9781292241623, 1292241624
3.	Marketing Research, Donald S Tull, Del I Hawkins, 6th Edition, Prentice Hall India, ISBN: 8120309618
3.	Marketing Management - A South Asian Perspective, Philip Kotler, Kevin Lane Keller, Abrahan Koshy, MithileshwarJha, 14th Edition, 2013, Pearson, ISBN –978-81-317-6716-0
4.	Marketing Research, David A. Aaker, V. Kumar, George S. Day, 9th Edition, 2008, John Wiley & Sons, ISBN: 978-265-1791-6

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**50%**	**50%**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS.**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto100 marks. Final test marks will be reduced to **40 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**40**	
Case Study-based Teaching-Learning	**10**	
Open Ended Exercises	**20**	
Video based seminar (4-5 minutes per student)	**10**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**
TOTAL MARKS FOR THE COURSE	**100**	**100**

Semester: IV						
FINANCIAL ACCOUNTING AND MANAGEMENT (Theory)						
Course Code	**:**	**21IM45**		**CIE**	**:**	**100 Marks**
Credits: L:T:P	**:**	**3:1:0**		**SEE**	**:**	**100 Marks**
Total Hours	**:**	**42L + 14T**		**SEE Duration**	**:**	**3.0 Hours**

UNIT-I	**09Hrs**
Overview and Financial Environment: Financial Management - an Overview, The financial systems. Fundamental Valuation Concept - Risk & Return	
UNIT-II	**09 Hrs**
Financial Accounting: Generally Accepted Accounting Practices (GAAP), difference between financial and cost accounting, Book keeping: double-entry accounting, journal & ledger posting.	
UNIT-II	**09 Hrs**
Financial Statements: Trial balance, preparation of Trading and Profit & Loss account, Balance sheet. (numericals with simple adjustments)	
UNIT-V	**07 Hrs**
Long -Term Financing – sources of long term finance, raising long term finance, Securities Market.	
UNIT-V	**08Hrs**
Working Capital Management–Working Capital policy , Cash Budgeting, Working Capital Financing	

Course Outcomes: After completing the course, the students will be able to	
CO1:	Explain the fundamental principle of finance and functions of the financial system.
CO2:	Demonstrate the ability to communicate accounting data effectively and provide knowledgeable recommendations.
CO3:	Apply appropriate judgment derived from knowledge of accounting theory, to financial analysis and decision making.
CO4:	Illustrate the strategies for financing long term and working capital in organizations.

Reference Books	
1.	Fundamentals of Financial Management, Prasanna Chandra, 7th Edition, 2020, McGraw-Hill Education (India), ISBN – 13:978-93-89811-26-1
2.	Financial Accounting, P.C. Tulsian& Bharat Tulsian, 2nd Edition, 2016, S. Chand & Company Ltd., ISBN : 978-93-525-3333-6
3.	Financial Management, M. Y. Khan, P. K. Jain, 8th edition, 2019, McGraw-Hill Education (India), ISBN –13:978-93 – 5316 – 218-4
4.	Financial Accounting, Dr. S N Maheshwari&Dr.Suneel K Maheshwari, CA Sharad k Maheshwari, 6th Edition, 2018, Vikas Publishing house Pvt Ltd., ISBN : 978-93-5271-853-5

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50% (CIE)**	**50% (SEE)**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to **20 MARKS.**	*****
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to **40 MARKS**	*****
Test – II		
EXPERIENTIAL LEARNING	**40**	*****
Case Study-based Teaching-Learning	**10**	*****
Sector wise study & consolidation (viz., Engg. Semiconductor Design, Healthcare & Pharmaceutical, FMCG, Automobile, Aerospace and IT/ITeS)	**20**	
Video based seminar (4-5 minutes per student)	**10**	
MAXIMUM MARKS FOR THE THEORY	**100 MARKS**	**100 MARKS**

Semester: IV						
Programming, Data Structures And Algorithms Using Python (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A1**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**

UNIT-I	**10Hrs**
Informal introduction to programming, algorithms and data structures via gcd, Downloading and installing Python, gcd in Python: variables, operations, control flow - assignments, condition-als, loops, functions. Python: types, expressions, strings, lists, tuples Python memory model: names, mutable and immutable values List operations: slices etc Binary search Inductive function definitions: numerical and structural induction Elementary inductive sorting: selection and insertion sortIn-place sorting.	
UNIT-II	**10 Hrs**
Basic algorithmic analysis: input size, asymptotic, complexity() notation Arrays vs lists Merge sort | Quicksort Stable sorting. Dictionaries More on Python functions: optional arguments, default values Passing functions as arguments Higher order functions on lists: map, alter, list comprehension. Exception handling Basic input/output Handling files String processing. Backtracking: N Queens, recording all solutions Scope in Python: local, global, nonlocal names| Nested functions Data structures: stack, queue |Heaps. Abstract datatypes, Classes and objects in Python "Linked" lists: find, insert, delete Binary search trees: find, insert, delete Height-balanced binary search trees.	
UNIT-III	**10 Hrs**
Efficient evaluation of recursive definitions: memoization Dynamic programming: examples | Other programming languages: C and manual memory management Other programming paradigms: functional programming.	

Course Outcomes: After completing the course, the students will be able to	
CO1	Understand and explore the fundamental concepts of various data structures.
CO2	Analyze and represent various data structures and its operations
CO3	Design algorithms using different data structures like Stack, Queue, List, Tree and hashing
CO4	Implement programs with suitable data structure based on the requirements of the real-time application.

Reference Books	
1	Data Structures using C and C++, YedidyahLangsam Moshe J. Augenstein and Aaron M. Tenenbaum, 2 nd Edition, 2009, PHI/Pearson.
2	Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, 4th Revised Edition, 2013, Addison-Wesley, ISBN-13: 9780132847377
3	Data Structures Using C, Reema Thareja, 1st Edition, 2011, Oxford Higher Education.
4	Fundamentals of Data Structures, Ellis Horowitz, SartajSahni, Illustrated Edition, Computer Science Press.

Semester: IV						
Foundation Course in Managerial Economics (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A2**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**

UNIT-I	**10Hrs**
Introduction, Demand and Supply, Elasticity of demand and supply, Government intervention and efficiency.	
UNIT-II	**10 Hrs**
Producer theory and cost curves, Market structures and perfect competition, Monopoly	
UNIT-III	**10 Hrs**
Monopolistic competition, Oligopoly	

Course Outcomes: After completing the course, the students will be able to	
CO1:	Explain the principles of management theory & recognize the characteristics of an organization.
CO2:	Demonstrate the importance of key performance areas in strategic management and design appropriate organizational structures and possess an ability to conceive various organizational dynamics.
CO3:	Select & Implement the right leadership practices in organizations that would enable systems orientation.
CO4:	Understand the basic concepts and principles of Micro economics and Macroeconomics.

Reference Books	
1	Management, Stephen Robbins, Mary Coulter & NeharikaVohra, 10th Edition, 2014, Pearson Education Publications, ISBN: 978-81-317-2720-1.
2	Management, James Stoner, Edward Freeman & Daniel Gilbert Jr, 6th Edition, 2009, PHI, ISBN: 81-203-0981-2.
3	Principles of Microeconomics, Steven A. Greenlaw, David Shapiro, 2nd Edition, 2017, ISBN:978-1-947172-34-0
4	Macroeconomics: Theory and Policy, Dwivedi D.N, 3rd Edition, 2010, McGraw Hill Education; ISBN-13: 978-0070091450.

Semester: IV						
Mechatronics (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A3**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**

UNIT-I	**10Hrs**
Introduction to mechatronics, Electric Circuits and Semiconductor Electronics, Sensors and transducers	
UNIT-II	**10 Hrs**
Actuators and mechanisms, Signal conditioning, Microprocessors and microcontrollers	
UNIT-III	**10 Hrs**
Modeling and system response, Design and mechatronics.	

Course Outcomes: After completing the course, the students will be able to	
CO1:	Describe the functions of Mechatronic systems in a modern automobile
CO2:	Evaluate the performance of an engine by its parameters
CO3:	Analyse the automotive exhaust pollutants as per emission norms
CO4:	Demonstrate communication of control modules using a On-Board Diagnostic kit

Reference Books	
1	Automotive Technology – A systems approach, Jack Erjavec, 5th Edition, Delamr Cengage Learning, ISBN-13: 978-1428311497
2	Automotive Engineering Fundamentals, Richard Stone and Jeffrey K. Ball, 2004, SAE International, ISBN: 0768009871
3	Bosch Automotive Handbook, Robert Bosch, 9 th Edition, 2004, ISBN: 9780768081527
4	Understanding Automotive Electronics, William B Ribbens, 5th Edition, Butterworth– Heinemann, ISBN 0-7506-7008-8

Semester: IV						
Mechanical Measurement systems (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A4**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**

UNIT-I	**10Hrs**
Basic concepts of measurement, functional elements of instruments, classification of measuring instruments, methods of correction for interfering and modifying inputs, static characteristics of measuring instruments. Static characteristics of measuring instruments, loading effect and impedance matching, statistical analysis, Chi-square test, least square method	
UNIT-II	**10 Hrs**
Uncertainty analysis, problem solving, generalized model of a measuring system, zero and first order system, first order system- step response. First order system- ramp response, first order system- impulse response, first order system frequency response, second order system- step response. Second order system- ramp response, second order system- impulse and frequency response, higher order systems, compensation, transducers. Transducers, flow measurement, temperature measurement.	
UNIT-III	**10 Hrs**
Strain gauges, piezoelectric transducers pressure measurement, force and torque measurement, displacement and acceleration measurement. Sound measurement, thermo physical properties measurement, flow visualization, air pollution sampling and measurement, problem solving.	

Course Outcomes: After completing the course, the students will be able to	
CO1:	Selecting suitable mechanical measuring instruments for basic and special requirement in the industries.
CO2:	Calibrating and analysing the characteristics of measuring instruments.
CO3:	Designing the fits and tolerances to improve the existing performance.
CO4:	Determine error and analysing uncertainty in the measurements.

Reference Books	
1	Engineering Metrology, Jain R.K., 17th edition, 1994, Khanna Publishers, ISBN: 71-7409-024-x
2	Mechanical Measurements, Beckwith T.G, and N. Lewis Buck, 5th Edition, 1991, Addison Wesley, ISBN: 81-7808-055-9
3	Electrical and Electronic Measurements and Instrumentation, A.K.Sawhney, 18th Edition, 2008, Dhanpat Rai and Sons, ISBN 8177000160
4	MEMS Mechanical Sensors, Stephen Beeby, 2004, Artech House, ISBN 1-58053-536-4

Semester: IV						
Mechanics of Machining (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A5**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**

UNIT-I	**10 Hrs**
Deformation of metals, Mechanism of plastic deformation, Machining processes: Single edge tool, types of chips. Tool geometry: single point cutting tool specifications, Tool specifications, conversion of tool angles, Multi-point cutting tools, Mechanics of orthogonal cutting, force relationships Determination of stress, strain, and strain rate, measurement of shear angle, other analysis for force relationships.	
UNIT-II	**10 Hrs**
Mechanics of oblique cutting, Measurement of cutting forces Thermal aspects of machining: Temperatures in orthogonal cutting, Tool wear and tool life and tool life equations, Economics in machining. Practical machining operations: Turning and shaping & planning operation, milling and drilling, Grinding of metals and mechanics of grinding process	
UNIT-III	**10 Hrs**
Abrasive machining and finishing operations, CNC machines and CNC programming Introduction to advanced machining processes.	

Course Outcomes: After completing the course, the students will be able to	
CO1:	Understand the cutting tool geometry, mechanism of chip formation and mechanics of orthogonal cutting.
CO2:	Identify basic parts and operations of machine tools including lathe, shaper, planer, drilling, boring, milling and grinding machine
CO3:	Select a measuring instrument to inspect the dimensional and geometric features of a given component.
CO4:	Select a machining operation and corresponding machine tool for a specific application in real time.

Reference Books	
1	Manufacturing technology by PN Rao
2	Production technology by RK Jain
3	Production Engineering, K.C Jain & A.K Chitaley, PHI Publishers
4	Technology of machine tools, S.F.Krar, A.R. Gill, Peter SMID, TMH (I)

Semester: IV						
User-centric Computing for Human-Computer Interaction (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A6**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**

UNIT-I	**10Hrs**
Introduction to user-centric design – case studies, historical evolution, issues and challenges and current trend. Engineering user-centric systems – relation with software engineering, iterative life-cycle, prototyping, guidelines, case studies User-centric computing – framework, introduction to models, model taxonomy. Computational user models (classical) – GOMS, KLM, Fitts' law, Hick-Hymans law.	
UNIT-II	**10 Hrs**
Computational user models (contemporary) 2D and 3D pointing, constrained navigation, mobile typing, touch interaction. Formal models – case study with matrix algebra, specification and verification of properties, formal dialog modeling.	
UNIT-III	**10 Hrs**
Empirical research – research question formulation, experiment design, data analysis, statistical significance test. User-centric design evaluation – overview of evaluation techniques, expert evaluation, user evaluation, model-based evaluation with case studies.	

Course Outcomes: After completing the course, the students will be able to	
CO1:	Design and Development of HCI Systems using Principles of Interactive Design, Design Rules, Implementation Support, Evaluation Techniques, Universal Design, User Support including the Effective and Affective User Experience.
CO2:	Design and Development of HCI Systems using suitable Tools
CO3:	Design and Development of HCI Systems using the basic concepts of Groupware, Ubiquitous Computing, Augmented Reality, Virtual Reality & Mixed Reality and Applications.
CO4:	Understanding/Recognizing Ethical Issues such as Copyright infringement while developing HCI systems using Principles of Human Psychology and Context-aware Processing.

Reference Books	
1	Julie A. Jacko, The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications, 3rd Edition, CRC Press, 2012.
2	Jason Jerald, "The VR Book: Human-Centered Design for Virtual Reality", Association for Computing Machinery and Morgan and Claypool Publishers, 2015.
3	Kelly S. Hale, Kay M. Stanney (Eds.), "Handbook of Virtual Environments: Design, Implementation, and Applications", CRC Press, Second Edition, 2015.
4	Samit Bhattacharya, "Human-Computer Interaction: User Centric Computing for Design", McGraw Hill Education (India) Pvt. Ltd, First Edition, 2019.

Semester: IV						
Data Base Management System (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A7**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**
UNIT-I						**10Hrs**
Course Overview, Introduction to RDBMS, Structured Query Language (SQL), Relational Algebra, Entity-Relationship Model.						
UNIT-II						**10 Hrs**
Relational Database Design, Application Development, Case Studies, Storage and File Structure Indexing and Hashing, Query Processing.						
UNIT-III						**10 Hrs**
Query Optimization, Transactions (Serializability and Recoverability), Concurrency Control, Recovery Systems, Course Summarization.						

Course Outcomes: After completing the course, the students will be able to	
CO1:	Understand and explore the needs and concepts of relational and NoSQL database.
CO2:	Apply the knowledge of logical database design principles to real time issues.
CO3:	Analyze and design relational and NoSQL data model concepts
CO4:	Develop applications using relational and NoSQL database.

Reference Books	
1	Fundamentals of Database Systems, Elmasri and Navathe, 7th Edition, 2016,Pearson Education, ISBN-13: 978-0-13-397077-7.
2	NoSQL A brief guide to the emerging world of Polyglot Persistence, Pramod J Sdalage, Martin Fowler, 2012, Addison-Wesley, ISBN 978-0-321-82662-6,
3	Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke, 3rd Edition, 2003, McGraw-Hill, ISBN : 978-0072465631.

Semester: IV						
Managing change in organizations (Elective-A: Professional Electives, Mooc Course)						
Course Code	**:**	**21IM4A8**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**Online Exam**

UNIT-I	**10Hrs**
Nature of Organizational Change, Perspectives of Organizational Change, image of change managers, Type of change: Incremental vs. transformation. Identifying the need for change: external and internal pressure for change; Scope of change: culture, strategy, technology, people management system, structure. Diagnosing organizational change: models and frameworks for change; managing resistance to change.	
UNIT-II	**10 Hrs**
Implementing change: Organizational development approaches to change; contingency and process based approaches. Linking vision and mission with change; leading change, politics of change, factors affecting Change. Communicating change, strategies for change communication, sustaining change; Evaluating change, the role of change agents.	
UNIT-III	**10 Hrs**
Organizational change and innovation, Linking change management with organizational learning and learning organizations. Case examples and successful change management efforts in Indian organizations, Turnaround strategies, strategic convergence and learning from change, organizational effectiveness and change.	

Course Outcomes: After completing the course, the students will be able to	
CO1:	Explain the concept of change management, its types and the reasons of change.
CO2:	Analyzes organizational change and requirements of change.
CO3:	Evaluates the opportunities of change.
CO4:	Determines in which cases organizational change is needed.

Reference Books	
1	Managing Transitions: Making the Most of Change by William Bridges and Susan Bridges, 3rd edition
2	Our Iceberg Is Melting: Changing and Succeeding Under Any Conditions by John Kotter and Holger Rathgeber, 10th edition
3	Who Moved My Cheese by Spencer Johnson and Kenneth Blanchard
4	Switch: How to Change Things When Change Is Hard by Chip Heath and Dan Heath

BE - III / IV Semester – Common to All

ಬಳಕೆ ಕನ್ನಡ - baLake Kannada (Kannada for Usage)

ಕನ್ನಡ ಕಲಿಕೆಗಾಗಿ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಪುಸ್ತಕ - (Prescribed Textbook to Learn Kannada)

ವಿಷಯ ಸಂಕೇತ (Course Code)	21KBK39/49	ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನದ ಅಂಕಗಳು (Continuous Internal Evaluation Marks)	50
ಒಂದು ವಾರಕ್ಕೆ ಬೋಧನಾ ಅವಧಿ (Teaching Hours / Week (L:T:P: S)	0:2:0:1	ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯ ಅಂಕಗಳು (Semester End Examination Marks)	50
ಒಟ್ಟು ಬೋಧನಾ ಅವಧಿ Total Hours of Pedagogy	25 ಗಂಟೆಗಳು	ಒಟ್ಟು ಅಂಕಗಳು (Total Marks)	100
ಕ್ರೆಡಿಟ್ಸ್ (Credits)	01	ಪರೀಕ್ಷೆಯ ಅವಧಿ (Exam Hours)	01 ಗಂಟೆ

ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು (Course Learning Objectives):

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

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

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

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

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
3. Key to Transcription.
4. ವೈಯಕ್ತಿಕ, ಸ್ವಾಮ್ಯಸೂಚಕ/ಸಂಬಂಧಿತ ಸಾರ್ವನಾಮಗಳು ಮತ್ತು ಪ್ರಶ್ನಾರ್ಥಕ ಪದಗಳು - **Personal Pronouns, Possessive Forms, Interrogative words**

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

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 – (ಅ, ಅದು, ಅವು, ಅಲ್ಲಿ) Predictive Forms, Locative Case**

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

Module-3

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

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

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
6. ಹೋಲಿಕೆ (ತರತಮ) , ಸಂಬಂಧ ಸೂಚಕ ಮತ್ತು ವಸ್ತು ಸೂಚಕ ಪ್ರತ್ಯಯಗಳು ಮತ್ತು ನಿಷೇಧಾರ್ಥಕ ಪದಗಳ ಬಳಕೆ- Comparitive, Relationship, Identification and Negation Words

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

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**

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಅನುಕೂಲಗಳು ಮತ್ತು ಫಲಿತಾಂಶಗಳು: **course Outcomes (Course Skill** Set): 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.

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). 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 Tests each of **20 Marks (duration 01 hour**)

a. First test at the end of 5th week of the semester
b. Second test at the end of the 10th week of the semester
c. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks : 1.** First assignment at the end of 4th week of the semester

7. 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**)

8. 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**

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

ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯು ಈ ಕೆಳಗಿನಂತಿರುತ್ತದೆ - **Semester End Exam (SEE):**

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

2. The question paper will have 50 questions. Each question is set for 01 mark.
3. SEE Pattern will be in MCQ Model for 50 marks. Duration of the exam is 01 Hour.

Textbook :

ಬಳಕೆ ಕನ್ನಡ

ಲೇಖಕರು : ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ

ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

BE - **III/IV Semester – Common to all**

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ

ವಿಷಯ ಸಂಕೇತ (Course Code)	21KSK39/49	ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನದ ಅಂಕಗಳು	50
ಒಂದು ವಾರಕ್ಕೆ ಬೋಧನಾ ಅವಧಿ (Teaching Hours / Week (L:T:P: S)	0:2:0:1	ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯ ಅಂಕಗಳು	50
ಒಟ್ಟು ಬೋಧನಾ ಅವಧಿ Total Hours of Pedagogy	25 ಗಂಟೆಗಳು	ಒಟ್ಟು ಅಂಕಗಳು	100
ಕ್ರೆಡಿಟ್ಸ್ (Credits)	01	ಪರೀಕ್ಷೆಯ ಅವಧಿ	01 ಗಂಟೆ

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯದ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

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.

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

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

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

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

ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

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	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.
ಘಟಕ -3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ	
1. ಡಿವಿಜಿ ರವರ ಮಂಕುತಿಮ್ಮನ ಕಗ್ಗದಿಂದ ಅಯ್ದ ಕೆಲವು ಭಾಗಗಳು 2. ಕುರುಡು ಕಾಂಚಾಣ : ದಾ.ರಾ. ಬೇಂದ್ರೆ 3. ಹೊಸಬಾಳಿನ ಗೀತೆ : ಕುವೆಂಪು	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.
ಘಟಕ -4 ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ	
1. ಡಾ. ಸರ್. ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ : ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ - ಎ ಎನ್ ಮೂರ್ತಿರಾವ್ 2. ಕರಕುಶಲ ಕಲೆಗಳು ಮತ್ತು ಪರಂಪರೆಯ ವಿಜ್ಞಾನ : ಕರೀಗೌಡ ಬೀಚನಹಳ್ಳಿ	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.
ಘಟಕ -5 ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನ	
1. ಯುಗಾದಿ : ವಸುಧೇಂದ್ರ 2. ಮೆಗಾನೆ ಎಂಬ ಗಿರಿಜನ ಪರ್ವತ : ಹಿ.ಚಿ. ಬೋರಲಿಂಗಯ್ಯ	
ಬೋಧನೆ ಮತ್ತು ಕಲಿಕಾ ವಿಧಾನ	ಪುಸ್ತಕ ಆಧಾರಿತ ಬ್ಲಾಕ್ ಬೋರ್ಡ್ ವಿಧಾನ, ಪ್ರಮುಖ ಅಂಶಗಳ ಚಾರ್ಟ್ ಗಳನ್ನು ಬಳಸುವುದು, ಪಿಪಿಟಿ ಮತ್ತು ದೃಶ್ಯ ಮಾಧ್ಯಮದ ವಿಡಿಯೋಗಳನ್ನು ಬಳಸುವುದು, ವಿದ್ಯಾರ್ಥಿಗಳೊಂದಿಗೆ ಚಟುವಟಿಕೆಗಳ ಮುಖಾಂತರ ಚರ್ಚಿಸುವುದು.

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಕಲಿಕೆಯಿಂದ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಆಗುವ ಪರಿಣಾಮಗಳು (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.

ಮೌಲ್ಯಮಾಪನದ ವಿಧಾನ (Assessment Details- both CIE and SEE) :

(methods of CIE - MCQ, Quizzes, Open book test, Seminar or micro project)
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 40% marks individually both in CIE and 35% marks in SEE to pass. Theory Semester End Exam (SEE) is conducted for 50 marks (01 hour duration). Based on this grading will be awarded.

Continuous Internal Evaluation:
Three Tests each of **20 Marks (duration 01 hour**)

a. First test at the end of 5th week of the semester
b. Second test at the end of the 10th week of the semester
c. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks : 1.** First assignment at the end of 4th week of the semester

2. 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**)

3. 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**
CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

ಸೆಮಿಸ್ಟರ್ ಅಂತ್ಯದ ಪರೀಕ್ಷೆಯು ಈ ಕೆಳಗಿನಂತಿರುತ್ತದೆ - Semester End Exam (SEE):

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

1. The question paper will have 50 questions. Each question is set for 01 mark.

SEE Pattern will be in MCQ Model for 50 marks. Duration of the exam is 01 Hour.

ಪಠ್ಯಪುಸ್ತಕ :

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ

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

ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

Semester: IV						
Course Title: National Service Scheme (Practical)						
Course Code	**:**	**21HSAE46A**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**L + T + 13 P**		**SEE Duration**	**:**	**2 Hours**

Prerequisites:

1. Students should have service-oriented mindset and social concern.
2. Students should have dedication to work at any remote place, any time with available resources and proper timemanagement for the other works.
3. Students should be ready to sacrifice some of the timely will and wishes to achieve service-oriented targets ontime.

Content	**13 Hours**

Students must take up any one activity on below mentioned topics and has to prepare contents for awareness and technical contents for implementation of the projects and has to present strategies for implementation of the same. Compulsorily must attend one camp.

CIE will be evaluated based on their presentation, approach, and implementation strategies.

(Any one of the below mentioned activity)

1. Helping local schools to achieve good result and enhance their enrolment in Higher/technical/ vocational education.
2. Preparing an actionable business proposal for enhancing the village/ farmer income and approach for implementation.
3. Developing Sustainable Water management system for rural/ urban areas and implementation approaches.
4. Setting of the information imparting club for women leading to contribution in social and economic issues.
5. Spreading public awareness/ government schemes under rural outreach program. (Minimum 5 programs)
6. Contribution to any national level initiative of Government of India. For eg. Digital India, Skill India, Swachh Bharat, Atmanirbhar Bharath, Make in India, Mudra scheme, Skill development programs etc..
7. Social connect and responsibilities
8. Plantation and adoption of plants. Know your plants
9. Organic farming, Indian Agriculture (Past, Present and Future) Connectivity for marketing
10. Waste management – Public, Private and Govt organization, 5 R's
11. Water conservation techniques – Role of different stakeholders - Implementation
12. Govt. School Rejuvenation and assistance to achieve good infrastructure.
13. Organize National integration and social harmony events/ workshops / seminars. (Minimum 2 programs)

AND <u>ONE NSS-CAMP</u>

Course Outcomes: After completing the course, the students will be able to	
CO1:	Understand the importance of his/her responsibilities towards society.
CO2:	Analyze the environmental and societal problems/ issues and will be able to design solutions for thesame.
CO3:	Evaluate the existing system and to propose practical solutions for the same for sustainable development.
CO4:	Implement government or self-driven projects effectively in the field.

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50%**	**50%**
	CIE	**SEE**
Presentation 1- Selection of topic- (phase 1) Justification for Importance, need of the hour withsurveyed data.	**10**	*****
EXPERIENTIAL LEARNING Presentation 2 (phase 2) Content development, strategies for implementationmethodologies.	**10**	*****
Case Study-based Teaching-Learning	**10**	Implementation strategies of the project with report
Sector wise study & consolidation	**10**	
Video based seminar (4-5 minutes per student)	**10**	
TOTAL MARKS FOR THE COURSE	**50 MARKS**	**50 MARKS**

Semester: IV						
Course Title: National Cadet Corps (Practical)						
Course Code	**:**	**21HSAE46B**		**CIE**	**:**	**50 Marks**
Credits: L: T:P	**:**	**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**15 P**		**SEE Duration**	**:**	**2 Hrs**

Unit 1	**7 Hrs**
Drill (Contact Hrs. 12). Foot Drill- Drill ki Aam Hidayaten, Word ki Command, Savdhan, Vishram, Aram Se, Murdna, Kadvar Sizing, Teen Line Banana, Khuli Line, Nikat Line, Khade Khade Salute Karna	
Unit 2	**3 Hrs**
Weapon Training (WT): Introduction & Characteristics of 7.62 Self Loading rifle, Identification of rifle parts	
Unit 3	**3 Hrs**
Adventure activities: Trekking and obstacle course	
Unit 4	**2 Hrs**
Social Service and Community Development (SSCD): Students will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, All National Festival	

Course Outcomes: Cadets will be able to: -	
CO1	Understand that drill as the foundation for discipline and to command a group for common goal.
CO2	Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents and identifying the parts of weapon
CO3	Understand that trekking will connect human with nature and cross the obstacles to experience army way of life.
CO4	Understand the various social issues and their impact on social life, Develop the sense of self-less social service for better social & community life.

Reference Books	
1	NCC Cadet Hand Book by R K Gupta, Ramesh Publishing House, New Delhi, Book code:R-1991, ISBN: 978-93-87918-57-3, HSN Code: 49011010
2	nccindia.ac.in

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50%**	**50%**
	CIE	SEE
Drill Skill Test	**20**	*****
Weapon Training	**10**	*****
Adventure activities	**10**	Report on adventure and social service activities
Social service activities	**10**	
TOTAL MARKS FOR THE COURSE	**50 MARKS**	**50 MARKS**

Semester: IV						
PHYSICAL EDUCATION (SPORTS & ATHLETICS) (Practical)						
Course Code	**:**	**21HSAE46C**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**30 P**		**SEE Duration**	**:**	**2.30 Hours**

Introduction of Physical Education and Sports			
General & Specific warm up exercises Conditioning exercises Any 2 Major Games Intramural Competitions			
Choose any one according to serial no			
1. Kho-Kho	Giving Kho, Single chain, Pole dive, Pole turning, 3-6 Up	**6. Kabaddi**	Hand touch, Chain hold, Ankle hold, Thigh hold, Getting bonus
2. Throwball	Service, Receive, Spin pass, Simple pass, Jump throw	**7. Volleyball**	Attack, Block, Service, Upper hand pass, Lower hand pass
3. Netball	Step with ball, Shooting, Passing, Blocking	**8. Handball**	Step with ball, Shooting, Passing,Blocking, Dribbling
4. Softball	Catching, Pitching, Slugging, Base Running, Stealing	**9. Football**	Dribbling, Chest Drop, Ball Control,Thigh Drop, Shooting
5. Ball badminton	Service, Fore hand receive, Back hand receive, Spin smash, Rally	**10. Table Tennis**	Service, Fore hand receive, Back hand receive, Smash, Rally

Course Outcomes: After completing the course, the students will be able to	
CO1	Understand the basic principles and practices of Physical Education and Sports.
CO2	Instruct the Physical Activities and Sports practices for Healthy Living
CO3	To develop professionalism among students to conduct, organize & Officiate Physical Education and Sports events at schools and community level

Topics for Viva:

1. On rules and regulations pertaining to the games / sports
2. On dimensions of the court, size / weight of the ball and standards pertaining to that sports / game
3. Popular players and legends at state level / National level/ International level
4. Recent events happened and winner / runners in that particular sport / game
5. General awareness about sport / game, sports happenings in the college campus

Reference Books	
1	Muller, J. P. (2000). Health, Exercise and Fitness. Delhi: Sports.
2	Vanaik.A (2005) Play Field Manual, Friends Publication New Delhi
3	IAAF Manual

4	M.J Vishwanath, (2002) Track and Field Marking and Athletics Officiating Manual, Silver Star Publication, Shimoga
5	Steve Oldenburg (2015) Complete Conditioning for Volleyball, Human Kinestics.
Note: Skills of Sports and Games (Game Specific books) may be referred	

ASSESSMENT AND EVALUATION PATTERN CIE-50 MARKS		
Activity book- **10** marks		
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marksadding up to **20 MARKS.**	
Quiz-II		
Test – I	Demonstration of skills is evaluated for10 marks adding up to **20 MARKS.**	
Test – II		
ASSESSMENT AND EVALUATION PATTERN SEE-50 MARKS		
Practical	**30 marks**	
Viva voce	**20 marks**	
Total	**50 marks**	

Rubric for CIE (2022 Scheme)		
Sl. No.	**Content**	**Marks**
1	Attendance	10
2	Performing Skills (Any Two)	20
3	Court measurement (Markings)	20
	Total:	**50**

Rubric for SEE (2022 Scheme)		
Sl. No.	**Content**	**Marks**
1	Performing Skills (Any Two)	30
2	Viva	20
	Total:	**50**

Semester: IV						
Course Title: Music (Practical)						
Course Code	**:**	**21HSAE46D**		**CIE**	**:**	**50 Marks**
Credits: L:T:P		**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**13P**		**SEE Duration**	**:**	**2 Hours**

Prerequisites:

1. Students should know basics of music.
2. Students should have dedication to learn and improve on their musical skills.
3. Students should have participated in musical events and have basic knowledge on how to present their music.

Content	**13 Hours**

1. Introduction to different genres of music
2. Evolution of genres in India: Inspiration from the world
3. Ragas, time and their moods in Indian Classical Music
4. Identification of ragas and application into contemporary songs
5. Adding your touch to a composition
6. Maths and Music: A demonstration
7. Harmonies in music
8. Chords: Basics and application into any song
9. Music Production-I
10. Music Production-II

Students have to form groups of 2-4 and present a musical performance/ a musical task which shall be given bythe experts. The experts shall judge the groups and award marks for the same.
CIE will be evaluated based on their presentation, approach and implementation strategies. Students need to submit their certificates of any event they participated or bagged prizes in. This shall also be considered for CIE evaluation.

Course Outcomes: After completing the course, the students will be able to	
CO1	Understand basics of Music and improve their skills
CO2	Appreciate the impacts on health and well being
CO3	Perform and present music in a presentable manner
CO4	Develop skills like team building and collaboration

Reference Books	
1.	Music Cognition: The Basics by Henkjan Honing
2.	Basic Rudiments Answer Book - Ultimate Music Theory: Basic Music Theory Answer Book by Glory StGermain
3.	Elements Of Hindustani Classical Music by Shruti Jauhari
4.	Music in North India: Experiencing Music, Expressing Culture (Global Music Series) by George E. Ruckert

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50%**	**50%**
	CIE	**SEE**
Presentation 1- Selection of topic- (phase 1)	**10**	*****
EXPERIENTIAL LEARNING Presentation 2 (phase 2)	**10**	*****
Case Study-based Teaching-Learning	**10**	Implementation strategies of theproject with report
Sector wise study & consolidation	**10**	
Video based seminar (4-5 minutes per student)	**10**	
TOTAL MARKS FOR THE COURSE	**50 MARKS**	**50 MARKS**

Semester: IV						
Course Title: Dance (Practical)						
Course Code	**:**	**21HSAE46D**		**CIE**	**:**	**50 Marks**
Credits: L:T:P		**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**13P**		**SEE Duration**	**:**	**2 Hours**

Prerequisites:

1. Students should have the will and interest to learn dancing.
2. Students should have a positive mindset.
3. Students should be willing to interact and cooperate in group activities.

Content	**13 Hours**

1. Introduction to Dance
2. Preparing the body for dancing by learning different ways to warm up.
3. Basics of different dance forms i.e. classical, eastern, and western.
4. Assessing the interest of students and dividing them into different styles based on interaction.
5. Advancing more into the styles of interest.
6. Understanding of music i.e. beats, rhythm, and other components.
7. Expert sessions in the respective dance forms.
8. Activities such as cypher, showcase to gauge learning.
9. Components of performance through demonstration.
10. Introduction to choreographies and routines.
11. Learning to choreograph.
12. Choreograph and perform either solo or in groups.

Course Outcomes: After completing the course, the students will be able to	
CO1:	Understand the fundamentals of dancing.
CO2:	Adapt to impromptu dancing.
CO3:	Ability to pick choreography and understand musicality.
CO4:	To be able to do choreographies and perform in front of a live audience.

Reference Books	
1	Dance Composition: A practical guide to creative success in dance making by Jacqueline M. Smith-Autard

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50%**	**50%**
	CIE	**SEE**
Presentation 1- Selection of topic- (phase 1)	**10**	*****
EXPERIENTIAL LEARNING Presentation 2 (phase 2)	**10**	*****
Case Study-based Teaching-Learning	**10**	Implementation strategies of the project with report
Sector wise study & consolidation	**10**	
Video based seminar (4-5 minutes per student)	**10**	
TOTAL MARKS FOR THE COURSE	**50 MARKS**	**50 MARKS**

Semester: III						
Course Title: Lights Camera Drama (Practical)						
Course Code	**:**	**21HSAE46D**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**13P**		**SEE Duration**	**:**	**2 Hours**

Prerequisites:

1. Students should have creative oriented mindset and social concern.
2. Students should have dedication to work with their classmates for long hours until a collective goal is reached.
3. Students should be ready to sacrifice some of the timely will and wishes to achieve targets on time.

Content	13 Hours

1. **Break the ICE**
2. **Introduction to freedom** Talk to each and every single person for a period of 5 complete minutes**.** This is aimed at to make everyone in the room comfortable with each other. This helps everyone get over social anxiety, Shyness and Nervousness.
3. **Ura**
4. **Rhythm Voice Projection, Voice Modulation, Weeping & Coughing** Voice projection is the strength of speaking or singing whereby the voice is used powerfully and clearly. It is a technique employed to command respect and attention, as when a teacher talks to a class, or simply to be heard clearly, as used by an actor in a theatre.
5. **It's Leviosa, Not Leviosaaa!**
6. **Speech work: Diction, Intonation, Emphasis, Pauses, Pitch and Volume Tempo Dialogues delivery.** The art of dialogue delivery plays a vital role in in ensuring the efficacy of communication especially from the dramatic aspect of it, this unit discusses some tips to help the young actors improve their dialogue delivery skills:
7. **Elementary, My dear Watson.**
8. **Responsibilities of an actor tools of an actor character analysis** Observations aspects, Stage presence,concentration, conviction, confidence, energy and directionality.
9. **Show time**
10. **Pick a genre: COMEDY, THRILLER, HORROR, and TRAGEDY: Showcase a performance.** Stylized acting with reference to historical and mythological plays. **Mime**: conventional, occupational and pantomime **Monoacting:** different types of characters

Course Outcomes: After completing the course, the students will be able to	
CO1:	Develop a range of Theatrical Skills and apply them to create a performance.
CO2:	Work collaboratively to generate, develop and communicate ideas.
CO3:	Develop as creative, effective, independent and reflective students who are able to make inform edchoices in process and performance.

CO4:	Develop an awareness and understanding of the roles and processes undertaken in contemporary professional theatre practice.

CIE's will be evaluated through mono-acting or dialogue. The students need to use whatever they've learnt through the course of the drama class. Judges/Teachers can award the marks accordingly. Certificates wonoutside of college, can be submitted for evaluation as well.

For SEE's. Students need to form groups of 4-6. They need to pick a genre and enact a play of at least 20mins long. The venue will be IEM auditorium. No mics should be used. They will be given 2 weeks to prepare.

Reference Books	
1	The Empty Space by Peter Brook
2	The Viewpoints Book: A Practical Guide to Viewpoints and Composition by Anne Bogart and Tina Landau

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50%**	**50%**
	CIE	**SEE**
Presentation 1- Selection of Script (phase 1)	**10**	*****
EXPERIENTIAL LEARNING Presentation 2 (phase 2)	**10**	*****
Case Study-based Teaching-Learning	**10**	Implementation strategies of the project with report
Interpretation of Script	**10**	
Performance based seminar (20 mins long)	**10**	
TOTAL MARKS FOR THE COURSE	**50 MARKS**	**50 MARKS**

Semester: IV						
Course Title: Art (Practical)						
Course Code	**:**	**21HSAE46E**		**CIE**	**:**	**50 Marks**
Credits: L:T:P		**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**13P**		**SEE Duration**	**:**	**2 Hours**

Prerequisites:

Although there are no prerequisite qualifications for this subject, students must have a basic understanding of and interest in the fields of art and design in order to enroll in it.

Content	**13 Hours**

1. Use points, line and curves to create various shapes and forms
2. Use of shapes and forms to create various objects and structures
3. Recognizing distinctions in objects when viewed from various perspectives and grasping basic notions of perspective
4. Students will be introduced to the significance of color in art, as well as the principles of color theory and application.
5. Applied the concepts of unity, harmony, balance, rhythm, emphasis and proportion, abstraction and stylization tocreate a composition.
6. Learn how to use which materials and for what types of art and textures.
7. Use of the above concepts to create art through the medium of collage, mosaic, painting, mural, batik, tie and dye.
8. Real world application of the above concepts in the form of book cover design and illustration, cartoon, poster,advertisements, magazine, computer graphics and animation
9. Familiarization with the many art forms and techniques of expression found throughout India.

AND

ONE EDUCATIONAL VISIT TO AN ART MUSEUM / INSTITUTE / GALLERY

Students must turn in assignments for each of the above said topics on a weekly basis and have to compulsorily take part in the museum visit. CIE will be evaluated based on a still life piece, a composition using any one of the media of composition and a presentation on Indian art styles and creation of a piece pertaining to the presented art style.

Reference Books	
1.	Catching the Big Fish: Meditation, Consciousness, and Creativity by David Lynch
2.	Art & Fear: Observations on the Perils (and Rewards) of Artmaking by David Bayles & Ted Orland

Course Outcomes: After completing the course, the students will be able to	
CO1:	To use lines, shapes, and colors to depict the various sentiments and moods of life and nature.
CO2:	To use one's creativity to develop forms and color schemes, as well as the ability to portray them effectively indrawing and painting on paper.
CO3:	To develop the ability to properly use drawing and painting materials (surfaces, tools and equipment, and so on).
CO4:	To improve their observation abilities by studying everyday items as well as numerous geometrical and non- geometrical (i.e. organic) shapes found in life and nature and to hone their drawing and painting talents in response to these insights.

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50%**	**50%**
	CIE	SEE
Presentation 1- Selection of topic- (phase 1)	**10**	*****
EXPERIENTIAL LEARNING Presentation 2 (phase 2)	**10**	*****
Case Study-based Teaching-Learning	**10**	Implementation strategies of the project with report
Sector wise study & consolidation	**10**	
Video based seminar (4-5 minutes per student)	**10**	
TOTAL MARKS FOR THE COURSE	**50 MARKS**	**50 MARKS**

Semester: IV						
Course Title: Photography (Practical)						
Course Code	**:**	**21HSAE46E**		**CIE**	**:**	**50 Marks**
Credits: L:T:P		**0:0:1**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**13P**		**SEE Duration**	**:**	**2 Hours**

Prerequisites:

1. Students should know basics of photography and cinematography.
2. Students should have dedication to learn and improve on their photography and film making skills.
3. Students should have participated in photography events.
4. Students should have a DSLR camera.

Content	**13 hours**

1. Introduction to photography.
2. Understanding the terminologies of DSLR.
3. Elements of photography.
4. Introduction to script writing, storyboarding.
5. Understanding the visualization and designing a set.
6. Basics of film acting
7. Video editing using software
8. Introduction to cinematography.
9. Understanding about lighting and camera angles.
10. Shooting a short film.

Students must form groups of 2-4 and present a short film which shall be given by the experts. The experts shalljudge the groups and award marks for the same.
CIE will be evaluated based on their presentation, approach and implementation strategies. Students need to submit their certificates of any event they participated or bagged prizes in. This shall also be considered for CIEevaluation.

Course Outcomes: After completing the course, the students will be able to	
CO1:	Understand basics of photography and videography and improve their skills
CO2:	Appreciate the skills acquired from photography
CO3:	Perform and present photos and films in a presentable manner
CO4:	Develop skills like team building and collaboration

Reference Books	
1.	Read This If You Want to Take Great Photographs – Henry Carroll
2.	The Digital Photography Book: Part 1 – Scott Kelby

ASSESSMENT AND EVALUATION PATTERN		
WEIGHTAGE	**50%**	**50%**
	CIE	**SEE**
Presentation 1- Selection of topic- (phase 1)	**10**	*****
EXPERIENTIAL LEARNING Presentation 2 (phase 2)	**10**	*****
Case Study-based Teaching-Learning	**10**	Implementationstrategies of theproject with report
Sector wise study & consolidation	**10**	
Video based seminar (4-5 minutes per student)	**10**	
TOTAL MARKS FOR THE COURSE	**50 MARKS**	**50 MARKS**

Semester: IV						
Course Title: Bridge Course – C Programming (Theory) (Common to all Branches)						
Course Code	**:**	**21DCS37**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**---**
Total Hours	**:**	**30L**		**SEE Duration**	**:**	**2 Hours**

Unit-I	**08 Hrs**
Introduction-Perspectives **Business Domains:** Programming. **Applications:** Design games, GUI, DBMS, Embedded Systems, Compilers and Operating Systems. **Introduction to Computer Concepts:** Introduction to Computer Hardware, Software and its Types. **Introduction to C programming:** Programming paradigms, Basic structure of C program, Process of compiling and running a C program, Features of C language, Character set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Pre-processor directives. **Handling Input and Output operations and operators:** Formatted input/output functions, Unformatted input/output functions with programming examples using all functions.	
Unit – II	**10 Hrs**
Operators: Introduction to operator set, Arithmetic operators, Relational operators, Logical Operators, Assignment operators, Increment and Decrement operators, Conditional operators, Bit-wise operators, Special operators. **Expressions:** Arithmetic expressions, evaluation of expressions, Precedence of arithmetic operators, Type conversion in expressions, Operator precedence and associativity. **Decision Making and Branching:** Decision making with 'if' statement, Simple 'if' statement, the 'if…else' statement, nesting of 'if…else' statements, The 'else if' ladder, The 'switch' statement, The '*?:'* operator, The '*goto'* statement.	
Unit –III	**12 Hrs**
Programming Constructs: Decision making and looping: The 'for','while','do-while' statements with examples, Jumps in loops**. Arrays:** Introduction to Arrays, Types of arrays, Declaration arrays, Initializing dimensional arrays (One Dimensional and Multidimensional Array) with examples. **String Operations:** Introduction, Declaration and Initializing String Variables using arrays, String operations and functions with examples. **Functions:** Need for Functions, Types of functions (User Defined and Built –In), working with functions, Definition, declaration and its scope. **Pointers:** Introduction, Benefits of using pointers, Declaration and Initialization of pointers, Obtaining a value of a variable.	

Course Outcomes: After completing the course, the students will be able to:-	
CO 1	Apply logical skills to solve the engineering problems using C programming constructs.
CO 2	Evaluate the appropriate method/data structure required in C programming to develop solutions by investigating the problem.
CO 3	Design a sustainable solution using C programming with societal and environmental concern by engaging in lifelong learning for emerging technology
CO 4	Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by exhibiting team work through oral presentation and written reports.

Reference Books	
1.	Programming in C, P. Dey, M. Ghosh, 2011, 2nd Edition, Oxford University press, ISBN (13): 9780198065289.
2.	Algorithmic Problem Solving, Roland Backhouse, 2011, Wiley, ISBN: 978-0-470-68453-5
3.	The C Programming Language, Kernighan B.W and Dennis M. Ritchie, 2015, 2nd Edition, Prentice Hall, ISBN (13): 9780131103627.
4.	Turbo C: The Complete Reference, H. Schildt, 2000, 4th Edition, Mcgraw Hill Education, ISBN-13: 9780070411838.
5.	Rasberry pi: https://www.raspberrypi.org/documentation/
6.	Nvidia: https://www.nvidia.com/en-us/
7.	Ardunio: https://www.arduino.cc/en/Tutorial/BuiltInExamples
8.	Scratch software: https://scratch.mit.edu/

PRACTICE PROGRAMS

Implement the following programs using cc/gcc compiler

1. Develop a C program to compute the roots of the equation $ax^2 + bx + c = 0$.
2. Develop a C program that reads N integer numbers and arrange them in ascending or descending order using selection sort and bubble sort technique.
3. Develop a C program for Matrix multiplication.
4. Develop a C program to search an element using Binary search and linear search techniques.
5. Using functions develop a C program to perform the following tasks by parameter passing to read a string from the user and print appropriate message for palindrome or not palindrome.
6. Develop a C program to compute average marks of 'n' students (Name, Roll_No, Test Marks) and search a particular record based on 'Roll_No'.
7. Develop a C program using pointers to function to find given two strings are equal or not.
8. Develop a C program using recursion, to determine GCD , LCM of two numbers and to perform binary to decimal conversion.

ASSESSMENT AND EVALUATION PATTERN		
	CIE	**SEE**
WEIGHTAGE	**100%**	**---**
QUIZZES		
Quiz-I	Each quiz is evaluated for 10 marks adding up to 1**0 MARKS.**	
Quiz-II		
THEORY COURSE (Bloom's Taxonomy Levels: Remembering, Understanding, Applying, Analyzing, Evaluating, and Creating)		
Test – I	Each test will be conducted for 50 Marks adding upto 100 marks. Final test marks will be reduced to 3**0 MARKS**	
Test – II		
EXPERIENTIAL LEARNING	**10**	
TOTAL MARKS FOR THE COURSE	**50**	**---**

Semester: IV						
Universal Human Values 2 (Theory & Practical)						
Course Code	**:**	**21HSU48**		**CIE**	**:**	**50 Marks**
Credits: L:T:P	**:**	**2:0:0**		**SEE**	**:**	**50 Marks**
Total Hours	**:**	**28 Hrs**		**SEE Duration**	**:**	**2.00 Hours**

Unit-I	**05 Hrs**
Course Introduction - Need, Basic Guidelines, Content and Process for Value Education: Purpose and motivation for the course, recapitulation from Universal Human Values-I, Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations, Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario, Method to fulfil the above human aspirations: understanding and living in harmony at various levels. Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.	
Unit – II	**06 Hrs**
Understanding Harmony in the Human Being - Harmony in Myself!: Understanding human being as a co-existence of the sentient 'I' and the material 'Body', Understanding the needs of Self ('I') and 'Body' - happiness and physical facility, Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer), Understanding the characteristics and activities of 'I' and harmony in 'I', Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail, Programs to ensure Sanyam and Health. Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease	
Unit –III	**06 Hrs**
Understanding Harmony in the Family and Society- Harmony in Human Human Relationship: Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship, Understanding the meaning of Trust; Difference between intention and competence, Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship, Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals, Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family. Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives	

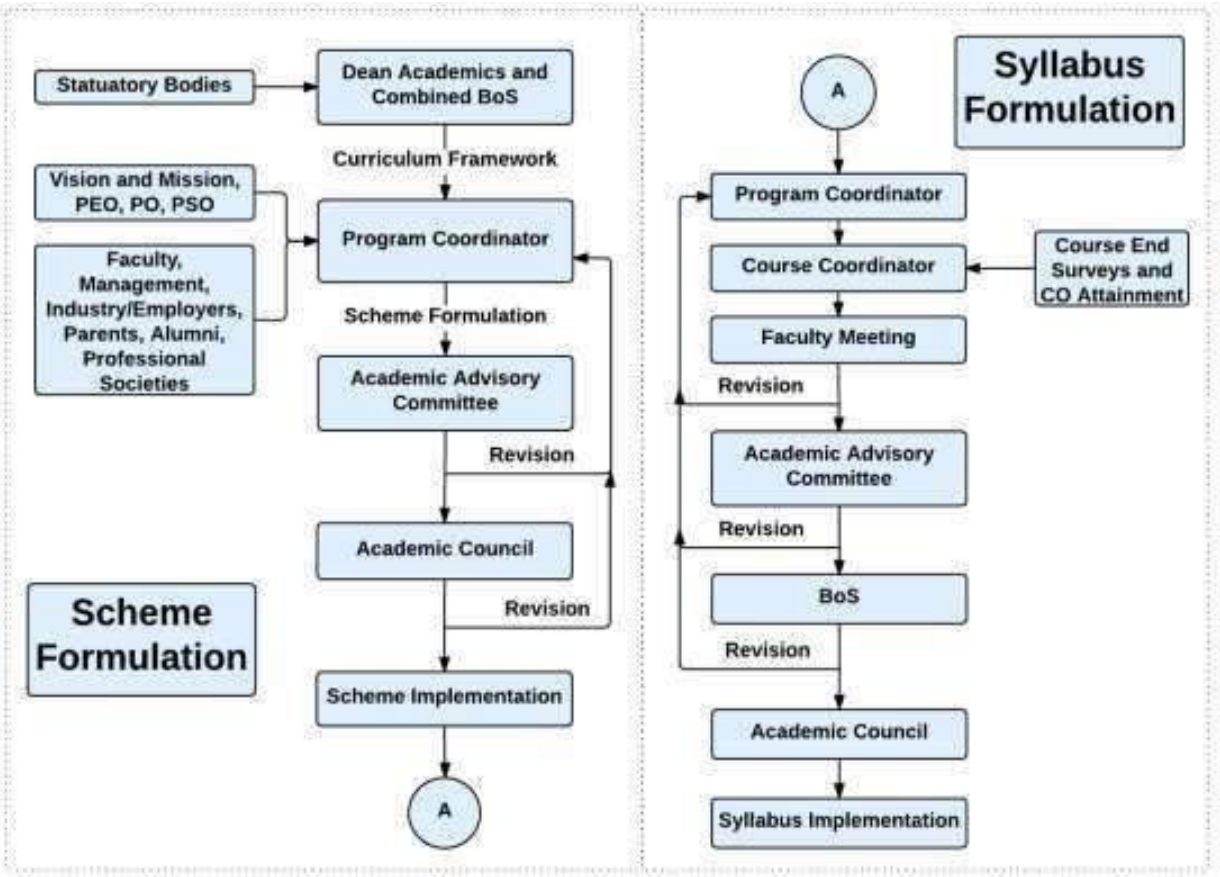
Unit –IV	05 Hrs
Understanding Harmony in the Nature and Existence - Whole existence as Coexistence: Understanding the harmony in the Nature, Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature, Understanding Existence as Co-existence of mutually interacting units in all pervasive space, Holistic perception of harmony at all levels of existence. Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.	
Unit –V	**06 Hrs**
Implications of the above Holistic Understanding of Harmony on Professional Ethics, Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order, Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems, Case studies of typical holistic technologies, management models and production systems, Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations, Sum up. Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.	

Course Outcomes: After completion of the course the students will be able to	
CO1	By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions,
CO2	While keeping human relationships and human nature in mind. They would have better critical ability.
CO3	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO4	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction

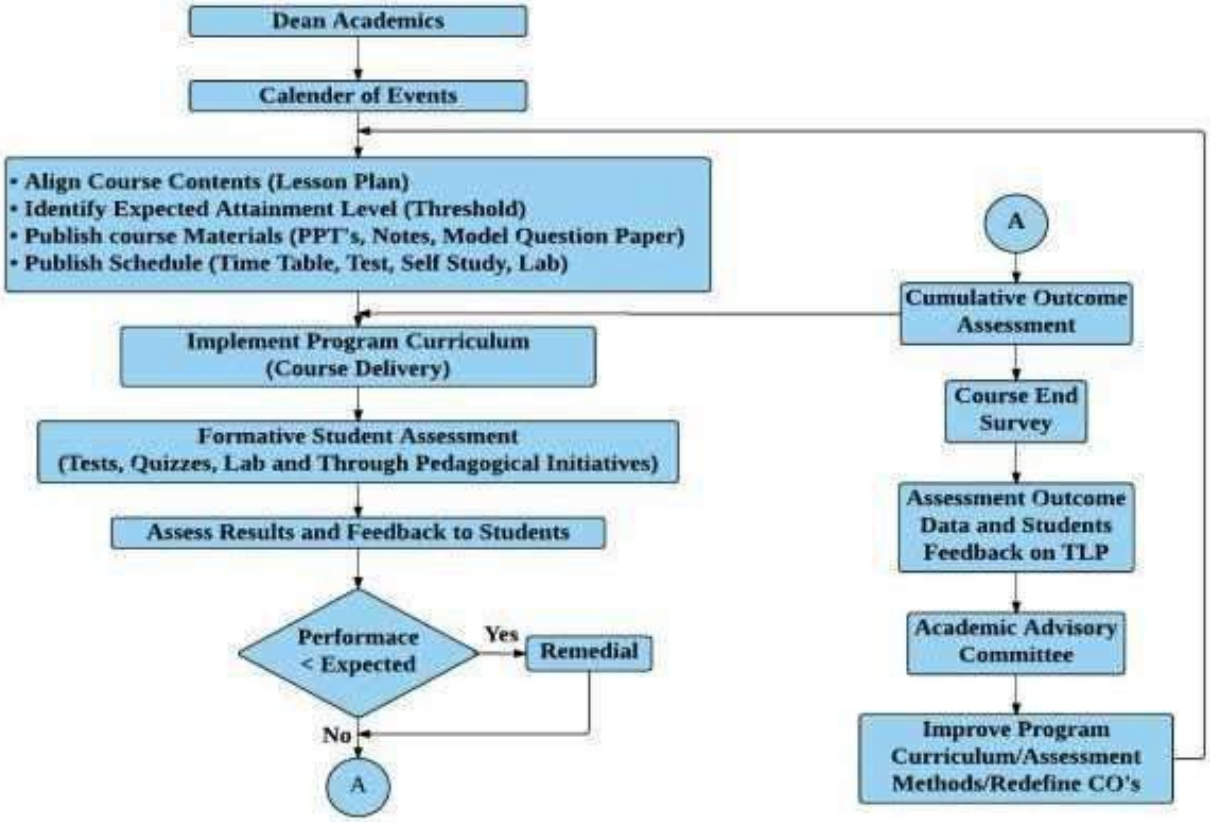
Reference Books	
1	Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2	Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004
3	The Story of Stuff (Book).
4	The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5	Small is Beautiful - E. F Schumacher.
6	Slow is Beautiful - Cecile Andrews.

ASSESSMENT AND EVALUATION PATTERN
This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation. Example: Assessment by faculty mentor: 10 marks Self-assessment: 10 marks Assessment by peers: 10 marks Socially relevant project/Group Activities/Assignments: 20 marks Semester End Examination: 50 marks. The overall pass percentage is 40%. In case the student fails, he/she must repeat the course

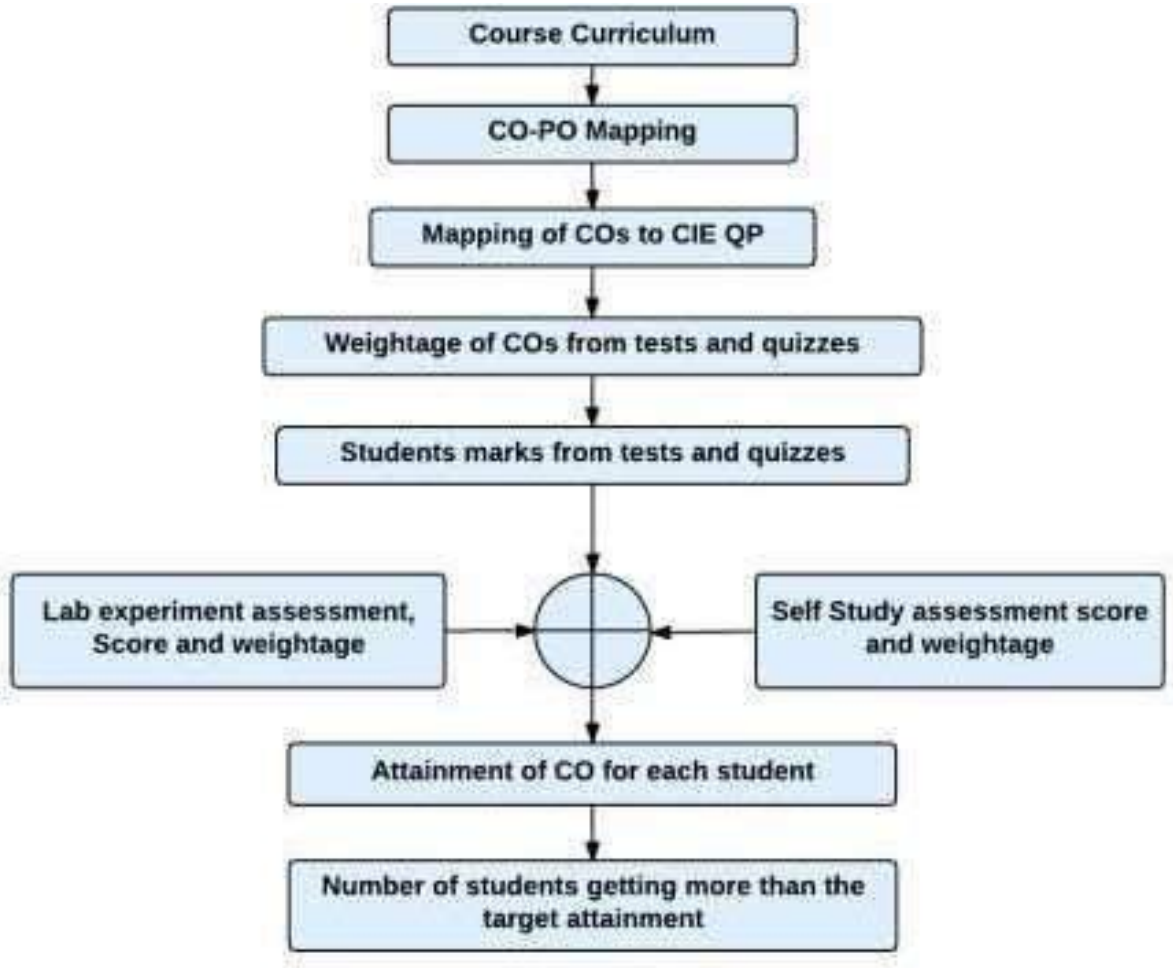
Curriculum Design Process



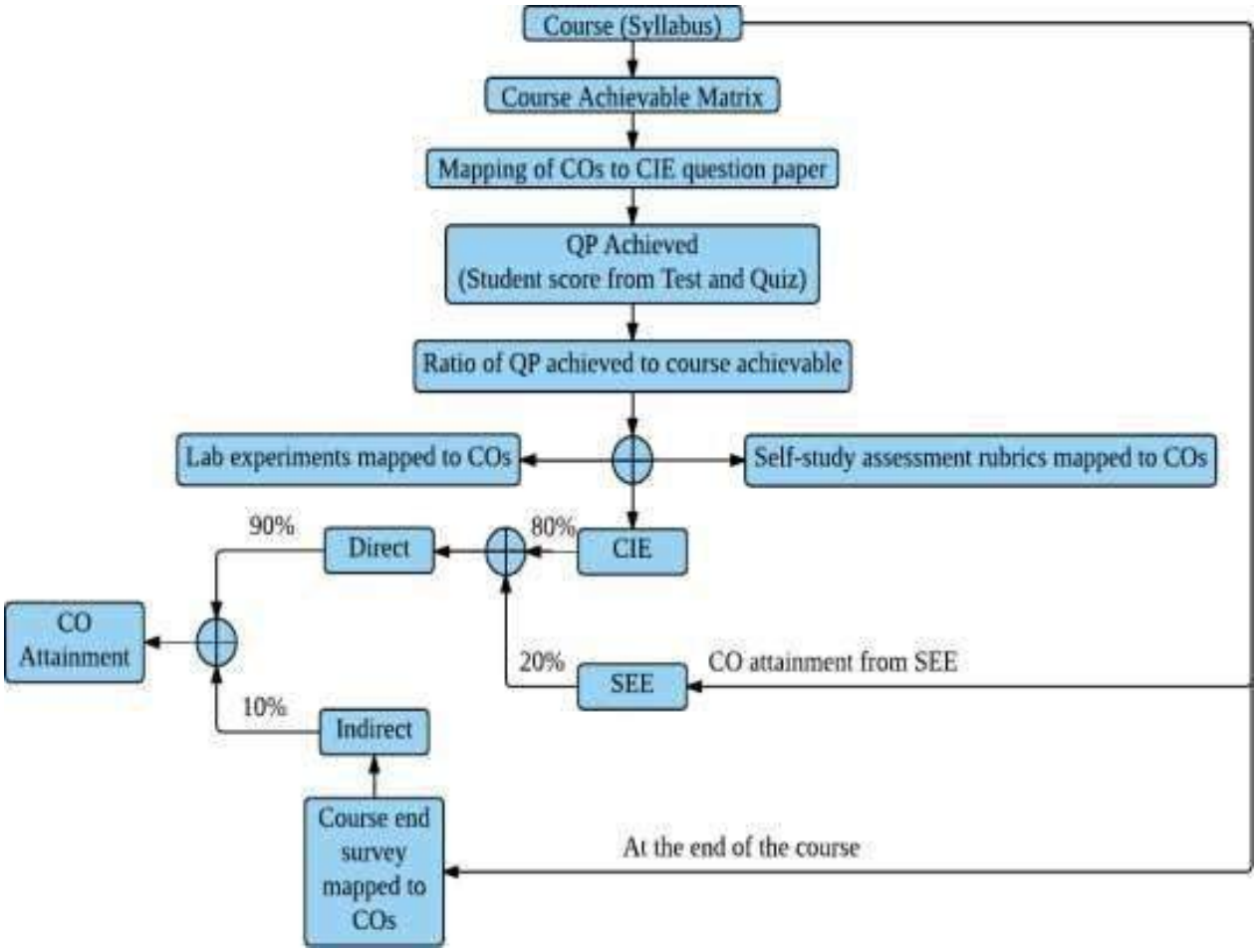
Academic Planning and Implementation



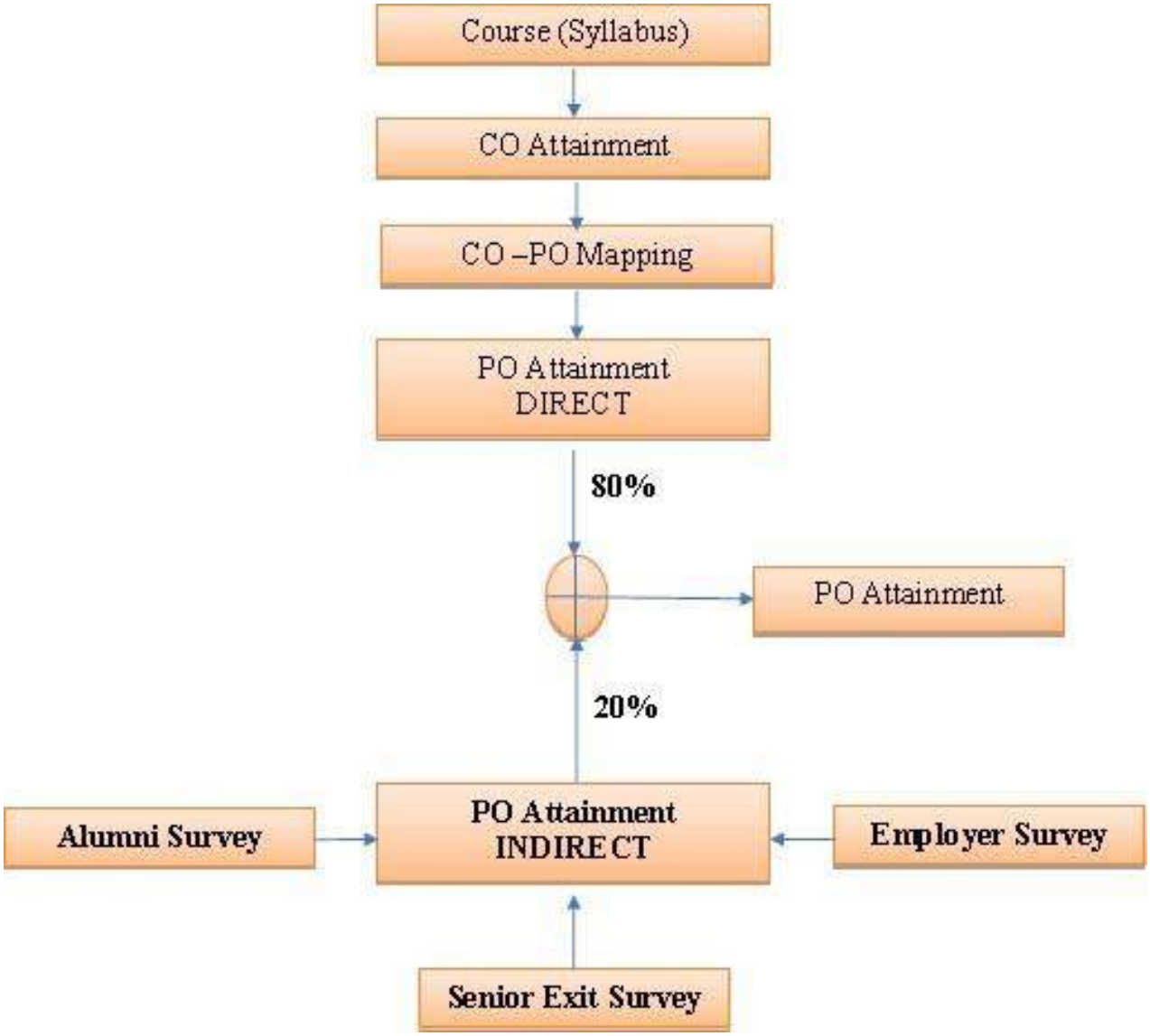
Process for Course Outcome Attainment



Final CO Attainment Process



Program Outcome Attainment Process



PROGRAM OUTCOMES (POs)

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

2. **Problem analysis:** Identify, formulate, 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 public health and safety, and 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 modelling 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 solutionsin 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 teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with the 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.