Academic Program: UG

Academic Year 2022-23

Syllabus

(Under NEP-2020)

Stream: Computer Science and Engineering
Branch: Artificial Intelligence and Machine Learning
I & II Semester B.E

SHRI DHARMASTHALA MANJUNATHESHWARA COLLEGE OF

ENGINEERING & TECHNOLOGY,

DHARWAD – 580 002

(An Autonomous Institute Approved by AICTE & Affiliated to VTU, Belagavi)

Ph: 0836-2447465Fax: 0836-2464638   Web: www.sdmcet.ac.in

SDM College of Engineering & Technology, Dharwad

It is certified that the scheme and syllabus for **I & II** semester of UG program in **Artificial Intelligence and Machine Learning** is recommended by Board of Studies of **Artificial Intelligence and Machine Learning** and **Computer Science and Engineering** Departments and approved by the Academic Council, SDM College of Engineering &Technology, Dharwad. This scheme and syllabus will be in force from the academic year 2022-23 till further revision.

Principal   Chairman BoS & HoD

(Our motto: Innovation through Information Technology)

College Vision and Mission

Vision:

To develop competent professionals with human values.

Mission:

1) To have contextually relevant Curricula.
2) To promote effective Teaching Learning Practices supported by Modern Educational Tools and Techniques.
3) To enhance Research Culture.
4) To involve Industrial Expertise for connecting classroom content to real life situations.
5) To inculcate Ethics and impart soft-skills leading to overall Personality Development.

SDMCET- Quality Policy

- In its quest to be a role model institution, committed to meet or exceed the utmost interest of all the stake holders.

SDMCET- Core Values

- Competency
- Commitment
- Equity
- Team work and
- Trust

Program Outcomes (POs):

Sl. No	(A)Description of Program Outcomes
Engineering Graduates will demonstrate:	
1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3	**Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
(B) Description of Program Specific Outcomes (PSOs)	
13	An ability to develop logical reasoning, coding skills, analysis and mathematical modeling.
14	An ability to modify, debug, test and adapt software modules for varied applications.

SDM College of Engineering and Technology
Department of Information Science and Engineering
Outcome-Based Education (OBE) and Choice Based Credit System(CBCS) (Effective from the academic year 2022-23)

I Semester   **(Chemistry Group)**
Stream: Computer Science and Engineering
Branch: Artificial Intelligence and Machine Learning

Sl.No	Course and course code		Coursetitle	TD/PSB	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	Practical /Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	TotalMarks	
					L	T	P	S					
1	ASC(IC)	22MATS11	Mathematics –I for CSE Stream	Maths	2	2	2	0	03	50	50	100	04
2	ASC(IC)	22CHES12	Chemistry for CSE stream	Chemistry	2	2	2	0	03	50	50	100	04
3	ESC	22POP13	Principles of Programming Using C	ISE	2	0	2	0	03	50	50	100	03
4	ESC-I	22ESC142	Introduction to Electrical Engineering (Engineering Science Course-I)	EEE	3	0	0	0	03	50	50	100	03
5	ETC-I	22ETC15H	Introduction to Internet of Things (IOT) (Emerging Technology Course-I)	ISE	3	0	0	0	03	50	50	100	03
6	AEC	22PWS16	Professional Writing Skills in English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMS	22ICO17	Indian Constitution	Humanities	1	0	0	0	01	50	50	100	01
8	HSMS	22SFH18	Scientific Foundations of health	ISE	1	0	0	0	01	50	50	100	01
	TOTAL									400	400	800	20

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

SDM College of Engineering and Technology
Department of Artificial Intelligence and Machine Learning
Outcome-Based Education (OBE) and Choice Based Credit System(CBCS) (Effective from the academic year 2022-23)

II Semester   **(Physics Group)**
Stream: Computer Science and Engineering
Branch: Artificial Intelligence and Machine Learning

Sl.No	Course and Course Code		Course Title	TD/PSB	Teaching Hours/Week				Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	SDA	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	ASC(IC)	22MATS21	Mathematics --II for CSE Stream	Maths	2	2	2	0	03	50	50	100	04
2	ASC(IC)	22PHYS22	Physics for CSE Stream	Physics	2	2	2	0	03	50	50	100	04
3	ESC	22CED23	Computer-Aided Engineering Drawing	Mech Engg dept	2	0	2	0	03	50	50	100	03
4	ESC-II	22ESC243	Introduction to Electronics Engineering (Engineering Science Course-II)	ECE	3	0	0	0	03	50	50	100	03
5	PLC-II	22ETC25B	Introduction to Python Programming (Programming Language Course-II)	AIML	2	0	2	0	03	50	50	100	03
6	AEC	22ENG26	Communicative English	Humanities	1	0	0	0	01	50	50	100	01
7	HSMC	22KSK27/ 22KBK27	Samskrutika Kannada / Balake Kannada	Humanities	1	0	0	0	01	50	50	100	01
8	AEC/SDC	22IDT28	Innovation and Design Thinking	ISE	1	0	0	0	01	50	50	100	01
TOTAL										**400**	**400**	**800**	**20**

SDA-Skill Development Activities, **TD/PSB**-Teaching Department / Paper Setting Board, **ASC**-Applied Science Course, **ESC**-Engineering Science Courses, **ETC**-Emerging Technology Course, **AEC**-Ability Enhancement Course, **HSMS**-Humanity and Social Science and management Course, **SDC**-Skill Development Course, **CIE**–Continuous

22MATS11	Mathematics-I for CSE Stream	(2-2-2-0)4

Contact Hours: 40

Course Learning Objectives:

- Familiarize the importance of calculus associated with one variable and multivariable for computer science and engineering.
- Analyze computer science and engineering problems by applying Ordinary Differential Equations.
- Apply the knowledge of modular arithmetic to computer algorithms.
- Develop the knowledge of Linear Algebra to solve the system of equations.

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Apply** the knowledge of calculus to solve problems related to polar curves and learn the notion of partial differentiation to compute rate of change of multivariate functions	-	-	1,2,12
CO-2	**Analyze** the solution of linear and nonlinear ordinary differential equations	-	-	1,2,12
CO-3	**Get** acquainted and **apply** modular arithmetic to computer algorithms	-	1,2	12
CO-4	**Make** use of matrix theory for solving for system of linear equations and **compute** eigen values and eigenvectors	-	1,2	12
CO-5	**Familiarize** with modern mathematical	-		1,2,12

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	1.4	1.4	-	-	-	-	-	-	-	-	-	1.0

Course Contents:

Unit-1

Calculus: Introduction to polar coordinates and curvature relating to Computer Science and engineering. Polar coordinates, Polar curves, angle between the radius vector and the tangent, angle between two curves. Pedal equations. Curvature and Radius of curvature - Cartesian, Parametric, Polar and Pedal forms. Problems. Self-study: Center and circle of curvature, evolutes and involutes. **8 Hrs.**

Unit-2

Series Expansion and Multivariable Calculus: Introduction of series expansion and partial differentiation in Computer Science & Engineering applications. Taylor's and Maclaurin's series expansion for one variable (Statement only) – problems. Indeterminate forms - L'Hospital's rule- Problems. Partial differentiation, total derivative - differentiation of composite functions. Jacobian and problems. Maxima and minima for a function of two variables. Problems. Self-study: Euler's theorem and problems. Method of Lagrange's undetermined multipliers with single constraint. **8 Hrs.**

Unit-3

Ordinary Differential Equations (ODEs) of first order: Introduction to first-order ordinary differential equations pertaining to the applications for Computer Science & Engineering. Linear and Bernoulli's differential equations. Exact and reducible to exact differential equations - Integrating **8 Hrs.**

factors on 1 ($-\partial N \partial x$) and 1 M ($\partial N \partial x - \partial M \partial y$). Orthogonal trajectories, L-R & C-R circuits. Problems. Non-linear differential equations: Introduction to general and singular solutions, Solvable for p only, Clairaut's equations, reducible to Clairaut's equations. Problems. Self-Study: Applications of ODEs, Solvable for x and y.

<p align="center">**Unit-4**</p>

Modular Arithmetic: Introduction of modular arithmetic and its applications in Computer Science and Engineering. Introduction to Congruences, Linear Congruences, The Remainder theorem, Solving Polynomials, Linear Diophantine Equation, System of Linear Congruence's, Euler's Theorem, Wilson Theorem and Fermat's little theorem. Applications of Congruences-RSA algorithm. Self-Study: Divisibility, GCD, Properties of Prime Numbers, Fundamental theorem of Arithmetic. **8 Hrs.**

<p align="center">**Unit-5**</p>

Linear Algebra: Introduction of linear algebra related to Computer Science & Engineering. Elementary row transformation of a matrix, Rank of a matrix. Consistency and Solution of system of linear equations - Gauss-elimination method, Gauss-Jordan method and approximate solution by Gauss-Seidel method. Eigenvalues and Eigenvectors, Rayleigh's power method to find the dominant Eigenvalue and Eigenvector. Self-Study: Solution of system of equations by Gauss-Jacobi iterative method. Inverse of a square matrix by Cayley- Hamilton theorem. **8 Hrs.**

Reference Books:

1) V. Ramana: "Higher Engineering Mathematics" McGraw-Hill Education, 11th Ed., 2017.

2) Srimanta Pal &Subodh C. Bhunia: "Engineering Mathematics" Oxford University Press, 3rd Ed., 2016.

3) N.P Bali and Manish Goyal: "A textbook of Engineering Mathematics" Laxmi Publications, 10th Ed., 2022.

4) C. Ray Wylie, Louis C. Barrett: "Advanced Engineering Mathematics" McGraw – Hill Book Co., Newyork, 6th Ed., 2017.

5) Gupta C.B, Sing S.R and Mukesh Kumar: "Engineering Mathematic for Semester I and II", Mc-Graw Hill Education(India) Pvt. Ltd 2015.

6) H. K. Dass and Er. RajnishVerma: "Higher Engineering Mathematics" S. Chand Publication, 3rd Ed., 2014.

7) James Stewart: "Calculus" Cengage Publications, 7th Ed., 2019.

8) David C Lay: "Linear Algebra and its Applications", Pearson Publishers, 4th Ed., 2018.

9) Gareth Williams: "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6th Ed., 2017.

10) William Stallings: "Cryptography and Network Security" Pearson Prentice Hall, 6th Ed., 2013.

11) David M Burton: "Elementary Number Theory" McGraw Hill, 7th Ed.,2010.

22CHES12	Applied Chemistry for CSE Stream	(2-2-2-0)4

Contact Hours: 40

Course Learning Objectives:

- To enable students to acquire knowledge on principles of chemistry for engineering applications.

- To develop an intuitive understanding of chemistry by emphasizing the related branches of engineering.

- To provide students with a solid foundation in analytical reasoning required to solve societal problems.

Course Outcomes:

Description of the Course Outcome:	Mapping to POs(1-12)		
At the end of the course the student will be able to:	Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1 **Identify** the terms and processes involved in scientific and engineering applications.	-	1	3
CO-2 **Explain** the phenomena of chemistry to describe the methods of engineering processes.	1	-	-
CO-3 **Solve** for the problems in chemistry that are pertinent in engineering applications.	-	2	3
CO-4 **Apply** the basic concepts of chemistry to explain the chemical properties and processes.	1	-	-
CO-5 **Analyze** properties and processes associated with chemical substances in multidisciplinary situations.	-	2	1

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	2.25	2.0	1.0	-	-	-	-	-	-	-	-	-

Course Contents:

Unit-1

Sensors: Introduction, working principle and applications of Conductor   **08 Hrs.**
metric sensors, Electrochemical sensors, Thermometric sensors, and
Optical sensors. Sensors for the measurement of dissolved oxygen
(DO). Electrochemical sensors for the pharmaceuticals, surfactants,
hydrocarbons. Electrochemical gas sensors for SOx and NOx.

Disposable sensors in the detection of biomolecules and pesticides. Energy Systems: Introduction to batteries, construction, working and applications of Lithium ion and Sodium ion batteries. Quantum Dot Sensitized Solar Cells (QDSSC's)- Principle, Properties and Applications. Self-learning: Types of electrochemical sensor, Gas sensor - O2 sensor, Biosensor - Glucose sensors. MO

Unit-2

Memory Devices: Introduction, Basic concepts of electronic memory, History of organic/polymer electronic memory devices, Classification of electronic memory devices, 1. NOTE: Wherever the contact hours is not sufficient, tutorial hour can be converted to theory hours 20.11.2022 types of organic memory devices (organic molecules, polymeric materials, organicinorganic hybrid materials). Display Systems: Photoactive and electroactive materials, Nanomaterials and organic materials used in optoelectronic devices. Liquid crystals (LC's) - Introduction, classification, properties and application in Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light Emitting Diodes (QLED's), Light emitting electrochemical cells. Self-learning: Properties and functions of Silicon (Si), Germanium (Ge), Copper (Cu), Aluminium (Al), and Brominated flame retardants in computers.

08 Hrs.

Unit-3

Corrosion Chemistry: Introduction, electrochemical theory of corrosion, types of corrosion-differential metal and differential aeration. Corrosion control - galvanization, anodization and sacrificial anode method. Corrosion Penetration Rate (CPR) - Introduction and numerical problem. Electrode System: Introduction, types of electrodes. Ion selective electrode – definition, construction, working and applications of glass electrode. Determination of pH using glass electrode. Reference electrode - Introduction, calomel electrode – construction, working and

08 Hrs.

applications of calomel electrode. Concentration cell– Definition, construction and Numerical problems. Analytical Techniques: Introduction, principle and instrumentation of Conductometry; its application in the estimation of weak acid. Potentiometry; its application in the estimation of iron. Self-learning: IR and UV- Visible spectroscopy.

Unit-4

Polymers: Introduction, Molecular weight - Number average, weight average and numerical problems. Conducting polymers – synthesis and conducting mechanism of polyacetylene and commercial applications. Preparation, properties, and commercial applications of graphene oxide. Green Fuels: Introduction, construction and working of solar photovoltaic cell, advantages, and disadvantages. Generation of energy (green hydrogen) by electrolysis of water and its advantages. Self-learning: Regenerative fuel cells **08 Hrs.**

Unit-5

E-Waste: Introduction, sources of e-waste, Composition, Characteristics, and Need of ewaste management. Toxic materials used in manufacturing electronic and electrical products, health hazards due to exposure to e-waste. Recycling and Recovery: Different approaches of recycling (separation, thermal treatments, hydrometallurgical extraction, pyrometallurgical methods, direct recycling). Extraction of gold from E-waste. Role of stake holders in environmental management of e-waste (producers, consumers, recyclers, and statutory bodies). Self-learning: Impact of heavy metals on environment and human health. **08 Hrs.**

Reference Books:

1) Wiley Engineering Chemistry, Wiley India Pvt. Ltd. New Delhi, 2013- 2nd Edition.
2) Engineering Chemistry, Satyaprakash&ManishaAgrawal, Khanna Book Publishing, Delhi.
3) A Text Book of Engg. Chemistry, ShashiChawla, DhanpatRai& Co. (P) Ltd.

4) Essentials of Physical Chemistry, Bahl&Tuli, S.Chand Publishing

5) Applied Chemistry, Sunita Rattan, Kataria 5. Engineering Chemistry, Baskar, Wiley.

6) Engineering Chemistry – I, D. GrourKrishana, Vikas Publishing.

7) A Text book of Engineering Chemistry, SS Dara& Dr. SS Umare, S Chand & Company Ltd., 12th Edition, 2011.

8) A Text Book of Engineering Chemistry, R.V. Gadag and NityanandaShetty, I. K. InternationalPublishing house. 2nd Edition, 2016.

22POP13	Principles of Programming using C	(2-0-2-0)3

Contact Hours: 40

Course Learning Objectives:

- Elucidate the basic architecture and functionalities of a Computer
- Apply programming constructs of C language to solve the real-world
- problems
- Explore user-defined data structures like arrays, structures and pointers in
- implementing solutions to problems
- Design and Develop Solutions to problems using structured programming Constructs such as functions and procedures

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:	Mapping to POs(1,12)		
	Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO 1 Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.		1,2,3	-
CO 2 Apply programming constructs of C language to solve the real world problem		1,2,3	-
CO 3 Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting		1,2,3	-

CO 4	Explore user-defined data structures like structures, unions and pointers in implementing solutions		2,6	-
CO 5	Design and Develop Solutions to problems using modular programming constructs using functions		-	1,2,3

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	1.7	1.8	1.7	-	-	2.0	-	-	-	-	-	-

Course Contents:

Unit-I

Flow-Chart and Algorithm: Solving various scientific, engineering and business related problems of varying complexity. **8 Hrs**

Fundamentals of C Programming Language: Program structure and execution. Character set, data types, operators, type conversion, expression evaluation. Input and output statements.

Unit-II

Decision making and Branching:if statement and its different forms, switch statement. **8 Hrs**

Unit-III

Decision making and Looping: loops and their behaviour – entry and exit controlled loops, conditional and unconditional jump statements, Nested loops. **8 Hrs**

Unit-IV

Arrays: Single and multidimensional arrays, advantages and disadvantages of arrays, searching and sorting **8 Hrs**

Strings: Definition, Different ways of reading and printing strings, string handling functions, applications.

Unit-V

Modular Programming: Declaration, definition and use of functions, passing **8 Hrs**

parameters to function.

Reference Books:

1 E Balagurusamy, "Programming in ANSI C", 6ᵗʰ Edition, Tata McGraw Hill, 2012.

2 Brian W Kernighan & Dennis M Ritchie, "The C programming language", 2ⁿᵈ Edition, Prentice-Hall India,2004.

3 R.G. Dromey., "How to solve it by Computer", Prentice-Hall India,2008

4 B A Forouzan and R F Gilberg, "Computer Program: A structured programming approach using C", 3ʳᵈ Edition, Thomson Learning,2005

5 Brain W. Kernighan and Rob Pike, "The Practice of Programming", Pearson Education Inc.2008.

22ESC142	Introduction to Electrical Engineering	(3-0-0-0)3

Contact Hours: 40

Course Learning Objectives:

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

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	Understand the concepts of various energy sources and Electric circuits.	1	2	3, 5, 6,7,8,12
CO-2	Apply the basic Electrical laws to solve circuits.	1,2	3	4,5,6,12
CO-3	Discuss the construction and operation of various Electrical Machines.	1	2	3,4,5,6,7,8,12
CO-4	Identify suitable Electrical machine for practical implementation.	1	2,3	4,6,7,8,12
CO-5	Explain the concepts of electric power transmission and distribution, electricity billing, circuit protective devices and personal safety measures.	1	3,6	2,5,7,8,11,12

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	3.0	2.0	1.6	1.0	1.0	1.2	1.0	1.0	-	-	1.0	1.0

Course Contents:

Unit-1

Introduction: Conventional and non-conventional energy resources; **08 Hrs.** General structure of electrical power systems using single line diagram approach. Power Generation: Hydel, Nuclear, Solar & wind power generation (Block Diagram approach). DC Circuits: Ohm's Law and its limitations. KCL & KVL, series, parallel, series-parallel circuits. Simple Numerical.

Unit-2

A.C. Fundamentals: Equation of AC Voltage and current, waveform, time **08 Hrs.**
period, frequency, amplitude, phase, phase difference, average value, RMS
value, form factor, peak factor. (only definitions) Voltage and current
relationship with phasor diagrams in R, L, and C circuits. Concept of
Impedance. Analysis of R-L, R-C, R-L-C Series circuits. Active power,
reactive power and apparent power. Concept of power factor. (Simple
Numerical). Three Phase Circuits: Generation of Three phase AC quantity,
advantages and limitations; star and delta connection, relationship between
line and phase quantities (excluding proof

Unit-3

DC Machines: DC Generator: Principle of operation, constructional details, **08 Hrs.**
induced emf expression, types of generators. Relation between induced emf
and terminal voltage. Simple numerical. DC Motor: Principle of operation,
back emf and its significance. Torque equation, types of motors,
characteristics and speed control (armature & field) of DC motors (series &
shunt only). Applications of DC motors. Simple numerical.

Unit-4

Transformers: Necessity of transformer, principle of operation, Types and **08 Hrs.**
construction of singlephase transformers, EMF equation, losses, variation of
losses with respect to load. Efficiency and simple numerical. Three-phase
induction Motors: Concept of rotating magnetic field, Principle of operation,
constructional features of motor, types – squirrel cage and wound rotor. Slip
and its significance simple numerical.

Unit-5

Domestic Wiring: Requirements, Types of wiring: casing, capping. Two way **08 Hrs.**
and three way control of load. Electricity Bill: Power rating of household
appliances including air conditioners, PCs, laptops, printers, etc. Definition of
"unit" used for consumption of electrical energy, two-part electricity tariff,
calculation of electricity bill for domestic consumers. Equipment Safety

measures: Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

Reference Books:

1) Basic Electrical Engineering by D C Kulshreshtha, Tata McGraw Hill, First Edition 2019.

2) A text book of Electrical Technology by B.L. Theraja, S Chand and Company, reprint edition 2014.

3) Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Tata McGraw Hill 4th edition, 2019.

4) Principles of Electrical Engineering & Electronics by V. K. Mehta, Rohit Mehta, S. Chand and Company Publications, 2nd edition, 2015.

5) Fundamentals of Electrical Engineering by Rajendra Prasad, PHI, 3rd edition, 2014.

22ETC15H	Introduction to Internet of Things(IOT)	(3-0-0-0)3

Contact Hours: 40

Course Learning Objectives:

- Understand about the fundamentals of Internet of Things and its building blocks along with their characteristics.

- Understand the recent application domains of IoT in everyday life.

- Gain insights about the current trends of Associated IOT technologies and IOT Analytics.

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1,12)		
		Substantial Level (3)	**Moderate Level (2)**	**Slight Level (1)**
CO 1	**Describe** the evolution of IoT, IoT networking components, and addressing strategies in IoT.	1,2	-	-
CO 2	**Classify** various sensing devices and actuator types	-	3, 4	-
CO 3	**Explain** Associated IOT Technologies	-	3	-
CO 4	**Illustrate** architecture of IOT Applications	-	3, 6	-
CO 5	**Demonstrate** the processing in IoT. **Develop** IoT applications using Arduino by making use of sensors and modules.	4	5	1,9

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	3	3	2	-	2	2	-	-	1	-	-	-

Course Contents:

Unit-1

Basics of Networking: Introduction, Network Types, Layered network **8 Hrs.** models Emergence of IoT: Introduction, Evolution of IoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components Textbook 1: Chapter 1- 1.1 to 1.3 Chapter 4 – 4.1 to 4.4

Unit-2

IoT Sensing and Actuation: Introduction, Sensors, Sensor Characteristics, **8 Hrs.** Sensorial Deviations, Sensing Types, Sensing Considerations, Actuators, Actuator Types, Actuator Characteristics. Textbook 1: Chapter 5 – 5.1 to 5.9

Unit-3

Associated Iot Technologies Cloud Computing: Introduction, **8 Hrs.**
Virtualization, Cloud Models, Service-Level Agreement in Cloud Computing,
Cloud Implementation, Sensor-Cloud: Sensors-as-a-Service. IOT CASE
STUDIES Agricultural IoT – Introduction and Case Studies Textbook 1:
Chapter 10– 10.1 to 10.6; Chapter 12- 12.1-12.2

Unit-4

Iot Case Studies And Future Trends: Vehicular IoT – Introduction **8 Hrs.**
Healthcare IoT – Introduction, Case Studies IoT Analytics – Introduction
Textbook 1: Chapter 13– 13.1; Chapter 14- 14.1-14.2; Chapter 17- 17.1

Unit-5

Arduino Programming: Features of Arduino, Arduino UNO, Arduino IDE, **8 Hrs.**
Arduino sketch structure, Arduino function libraries, Blinking LED example;
Operators, control statements, loops, arrays, string, interrupts, Traffic
Control System example. Integration of Sensors, Actuators and modules
with Arduino: Sensor Types, Sensor Interface with Arduino, Interfacing DHT,
LM35, LDR, Accelerometer and HCSR04 sensors with Arduino; Actuators,
Types of Motor Actuators, Servo motor, Servo library on Arduino; HC05
Bluetooth module, Features, Interfacing HC05 with Arduino, Controlling LED
using Bluetooth; ESP8266 wifi module, Features, Send LM35 sensor data to
cloud using wifi module

Reference Books:

1) SudipMisra, Anandarup Mukherjee, Arijit Roy, "Introduction to IoT", Cambridge University Press 2021.

2) S. Misra, C. Roy, and A. Mukherjee, 2020. Introduction to Industrial Internet of Things and Industry 4.0. CRC Press. 3..

3) Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)",1st Edition, VPT, 2014

4) Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to

Connecting Everything", 1st Edition, Apress Publications, 2013.

5) AmmarRayes, Samer Salam, "Internet of Things From Hype to Reality – The Road to Digitalization", Second Edition, , Springer Nature Switzerland AG 2017, 2019

22PWS16	Professional Writing Skills in English	(1-0-0-0)1

Contact Hours: 15

Course Learning Objectives:

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

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Explain** and **identify** the Common Errors in Writing and Speaking.	-	10	-
CO-2	**Achieve** better Technical writing and Presentation skills.	-	10	-
CO-3	**Read** Technical proposals properly and make them to Write good technical reports.	10	-	-
CO-4	**Acquire** Employment and Workplace communication skills.	-	10	-
CO-5	**Learn** about Techniques of Information Transfer through presentation in different level.	10	-	-

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	-	-	-	-	-	-	-	-	-	2.4	-	-

Course Contents:

Unit-1

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

03 Hrs.

Unit-2

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

03 Hrs.

Unit-3

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

03 Hrs.

Unit-4

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

03 Hrs.

Unit-5

Professional Communication at Workplace: Group Discussion and Professional Interviews, Characteristics and Strategies of a GD and PI's,

03 Hrs.

Intra and Interpersonal Communication Skills at workplace, Non-Verbal Communication Skills and its importance in GD and Interview. Presentation skills and Formal Presentations by Students, Strategies of Presentation Skills.

Reference Books:

1) "Professional Writing Skills in English" published by Fillip Learning – Education (ILS), Bangalore – 2022.

2) "Functional English" (As per AICTE 2018 Model Curriculum) (ISBN-978-93-5350-047-4) Cengage learning India Pvt Limited [Latest Edition 2019].

3) English for Engineers by N.P.Sudharshana and C.Savitha, Cambridge University Press – 2018.

4) Technical Communication by Gajendra Singh Chauhan and Et al, (ISBN-978-93-5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.

5) Technical Communication – Principles and Practice, Third Edition by Meenakshi Raman and Sangeetha Sharma,
   Oxford University Press 2017.

6) High School English Grammar & Composition by Wren and Martin, S Chandh& Company Ltd – 2015.

7) Effective Technical Communication – Second Edition by M Ashraf Rizvi, McGraw Hill Education (India) Private.

22ICO17	Indian Constitution	(1-0-0-0)1

Contact Hours: 15

Course Learning Objectives:

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

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Analyze** the basic structure of Indian Constitution.	-	2	-
CO-2	**Remember** their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.	-	1	-
CO-3	**Know** about our Union Government, political structure & codes, procedures.	-	1	-
CO-4	**Understand** our State Executive & Elections system of India.	-	1	-
CO-5	**Remember** the Amendments and Emergency Provisions, other important provisions given by the constitution.	-	1	-

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	2.0	2.0	-	-	-	-	-	-	-	-	-	-

Course Contents:

Unit-1

Indian Constitution: Necessity of the Constitution, Societies before and after the Constitution adoption. Introduction to the Indian constitution, Making of the Constitution, Role of the Constituent Assembly. Module-2 **03 Hrs.**

Unit-2

Salient features of India Constitution. Preamble of Indian Constitution & Key concepts of the Preamble. Fundamental Rights (FR's) and its Restriction and limitations in different Complex Situations. building. **03 Hrs.**

Unit-3

Directive Principles of State Policy (DPSP's) and its present relevance in Indian society. Fundamental Duties and its Scope and significance in Nation, Union Executive: Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet. M **03 Hrs.**

Unit-4

Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Judicial System of India, Supreme Court of India and other Courts, Judicial Reviews and Judicial Activism. **03 Hrs.**

Unit-5

State Executive and Governer, CM, State Cabinet, Legislature - VS & VP, Election Commission, Elections & Electoral Process. Amendment to Constitution, and Important Constitutional Amendments till today. Emergency Provisions. **03 Hrs.**

Reference Books:

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

3) "Constitution of India, Professional Ethics and Human Rights" by Shubham Singles, Charles E. Haries, and et al: published by Cengage Learning India, Latest Edition – 2019.

4) "The Constitution of India" by Merunandan K B: published by Merugu Publication, Second Edition, Bengaluru.

5) "SamvidhanaOdu" - for Students & Youths by Justice HN NagamohanDhas, Sahayana, Kerekon.

6) M.Govindarajan, S.Natarajan, V.S.Senthilkumar, "Engineering Ethics", Prentice – Hall, 2004.

22SFH18	Scientific Foundations of Health	(1-0-0-0)1

Contact Hours: 15

Course Learning Objectives:

- To know about Health and wellness (and its Beliefs) &its balance for positive mindset.

- To build the healthy lifestyles for good health for their better future.

- To Create a Healthy and caring relationships to meet the requirements of good/social/positive life.

- To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future

- To Prevent and fight against harmful diseases for good health through positive mindset

Course Outcomes:

Description of the Course Outcome:		Mapping to POs(1-12)		
At the end of the course the student will be able to:		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Explain** and **analyze** about Health and wellness (and its Beliefs) & its balance for positive mindset.	-	1,2	-
CO-2	**Develop** the healthy lifestyles for	-	1,2	-

	good health for their better future.				
CO-3	**Build** a Healthy and caring relationships to meet the requirements of good/social/positive life.	-	**1,2**	-
CO-4	**Learn** about Avoiding risks and harmful habits in their campus and outside the campus for their bright future.	-	**1,2**	-
CO-5	**Prevent** and **fight** against harmful diseases for good health through positive mindset.	-	**1,2**	-

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	2.0	2.0	-	-	-	-	-	-	-	-	-	-

Course Contents:

Unit-1

Good Health & It's balance for positive mindset: Health -Importance of **03 Hrs** Health, Influencing factors of Health, Health beliefs, Advantages of good health, Health & Behavior, Health & Society, Health & family, Health & Personality, Psychological disorders-Methods to improve good psychological health, Changing health habits for good health.

Unit-2

Building of healthy lifestyles for better future: Developing healthy diet for **03 Hrs** good health, Food & health, Nutritional guidelines for good health, Obesity & overweight disorders and its management, Eating disorders, Fitness components for health, Wellness and physical function, How to avoid exercise injuries.

Unit-3

Creation of Healthy and caring relationships : Building communication   **03 Hrs**
skills, Friends and friendship - Education, the value of relationship and communication skills, Relationships for Better or worsening of life, understanding of basic instincts of life (more than a biology), Changing health behaviors through social engineering.

Unit-4

Avoiding risks and harmful habits: Characteristics of health compromising   **03 Hrs**
behaviors, Recognizing and avoiding of addictions, How addiction develops, Types of addictions, influencing factors of addictions, Differences between addictive people and non addictive people & their behaviors. Effects of addictions Such as..., how to recovery from addictions.

Unit-5

Preventing & fighting against diseases for good health: How to protect   **03 Hrs**
from different types of infections, How to reduce risks for good health, Reducing risks & coping with chronic conditions, Management of chronic illness for Quality of life, Health & Wellness of youth :a challenge for upcoming future, Measuring of health & wealth status.

Reference Books:

1) "Scientific Foundations of Health" – Study Material Prepared by Dr. L Thimmesha, Published in VTU - University Website.

2) "Scientific Foundations of Health", (ISBN-978-81-955465-6-5) published by Infinite Learning Solutions, Bangalore – 2022.

3) Health Psychology - A Textbook, FOURTH EDITION by Jane Ogden McGraw Hill Education (India) Private Limited - Open University Press.

4) Health Psychology (Second edition) by Charles Abraham, Mark Conner, Fiona Jones and Daryl O'Connor – Published by Routledge 711 Third Avenue, New York, NY 10017.

5) HEALTH PSYCHOLOGY (Ninth Edition) by SHELLEY E. TAYLOR - University of California, Los Angeles, McGraw Hill Education (India) Private Limited - Open University Press.

6) SWAYAM / NPTL/ MOOCS/ We blinks/ Internet sources/ YouTube videos and other materials / notes.

7) Scientific Foundations of Health (Health & Wellness) - General Books published for university and colleges references by popular authors and published by the reputed publisher.

CIE and SEE Evaluation (from 2022-23 batch)

CIE for Non integrated Courses: With LTP 3-0-0 and 4-0-0 or 2-2-0/3-2-0

➢ Two tests + One Improvement test : (20+20+20 each of one hour duration)

  Two higher scores from three tests are taken representing 40 marks

➢ QP pattern: 3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub divisions.

➢ CTA: Minimum two components such as assignments, quiz, seminar, written assignment, any technical activity related to course etc. each of 5 marks. Total CTA marks- 10

➢ CIE= 40(from tests)+10(from CTA)   = 50 marks

➢ SEE: Exam will be conducted for 100 marks with 3 hours duration and will be scaled down to 50 marks. Five modules with built in choice. Each question can be with maximum of three sub divisions.

CIE for Integrated Courses: With LTP 2-0-2 and 3-0-2 and 2-2-2

➢ Theory CIE component:

  Two tests + One Improvement test (20+20+20 each of one hour duration)

➢ Two higher scores from three tests are taken representing 40 marks

➢ QP pattern: 3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub divisions.

➢ Practical CIE component (CTA): Laboratory component. 5 marks for conduction, regularity, involvement, journal etc. Lab Test -5 marks. A test as per the schedule announced will be conducted at the end for 50 marks and scaled down to 5 marks. If the performance is not satisfactory in laboratory the student shall be detained and required to reregister for the course as a whole whenever offered next.

➢ CIE= 40(from tests) +10(from CTA i.e. lab component)   = 50 marks

➢ SEE: Exam will be conducted for 100 marks with 3 hours duration and will be

scaled down to 50 marks. Five modules with built in choice. Each question can be with maximum of three sub divisions. The questions shall be asked to test practical understanding for maximum of 30 marks.

CIE for AEC/HSMS/SDC Courses: With LTP 1-0-0 for 1 Credit

➢ CIE for 1 credit AEC/HSMS Courses with LTP 1-0-0

➢ Two tests + One Improvement test

➢ 20+20+20 each of one hour duration

➢ QP pattern for IA: MCQ 15 questions

➢ Two higher scores from three tests are taken representing 40 marks

➢ CTA: Minimum two components such as assignments ,quiz, seminar, written assignment , any learning activity related to the course etc. each of 5 marks.

➢ CIE= 40(from tests)+10(from CTA)= 50 marks

➢ SEE: Exam will be conducted for 50 marks with 1 hour duration. There will be 50 MCQs. The question paper will contain 10 MCQ questions from each module.

22MATS21	Mathematics-II for CSE Stream	(2-2-2-0)4

Contact Hours: 40

Course Learning Objectives:

- Familiarize the importance of Integral calculus and Vector calculus.
- Learn vector spaces and linear transformations.
- Develop the knowledge of numerical methods and apply them to solve transcendental and differential equations.

Course Outcomes:

Description of the Course Outcome:		Mapping to POs(1-12)		
At the end of the course the student will be able to:		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Apply** the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume.	-	-	1,2,12
CO-2	**Understand** the applications of vector calculus refer to solenoidal, and irrotational vectors, Orthogonal curvilinear coordinates.	-	-	1,2,12
CO-3	**Demonstrate** the idea of Linear dependence and independence of sets in the vector space, and linear transformation	-	1,2	12
CO-4	**Apply** the knowledge of numerical methods in analyzing the discrete data and solving the physical and engineering problems.	-	1,2	12
CO-5	Get **familiarize** with modern	-		1,2,12

mathematical tools namely MATHEMATICA / MATLAB / PYTHON / SCILAB			

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	1.4	1.4	-	-	-	-	-	-	-	-	-	1.0

Course Contents:

Unit-1

Integral Calculus: Introduction to Integral Calculus in Computer Science & Engineering. Multiple Integrals: Evaluation of double and triple integrals, evaluation of double integrals by change of order of integration, changing into polar coordinates. Applications to find Area and Volume by double integral. Problems. Beta and Gamma functions: Definitions, properties, relation between Beta and Gamma functions. Problems. Self-Study: Center of gravity, Duplication formula.
8 Hrs.

Unit-2

Vector Calculus: Introduction to Vector Calculus in Computer Science & Engineering. Scalar and vector fields. Gradient, directional derivative, curl and divergence - physical interpretation, solenoidal and irrotational vector fields. Problems. Curvilinear coordinates: Scale factors, base vectors, Cylindrical polar coordinates, Spherical polar coordinates, transformation between cartesian and curvilinear systems, orthogonality. Problems. Self-Study: Volume integral.
8 Hrs.

Unit-3

Vector Space and Linear Transformations: Importance of Vector Space and Linear Transformations in the field of Computer Science & Engineering. Vector spaces: Definition and examples, subspace, linear span, Linearly independent and dependent sets, Basis and dimension. Problems. Linear transformations: Definition and examples, Algebra of transformations, Matrix of a linear transformation. Change of coordinates, Rank and nullity of a linear operator, rank-nullity theorem. Inner product spaces and orthogonality. Problems. Self-
8 Hrs.

study: Angles and Projections. Rotation, reflection, contraction and expansion.

Unit-4

Numerical methods-1: Importance of numerical methods for discrete data in the field of computer science & engineering. Solution of algebraic and transcendental equations - Regula-Falsi and Newton-Raphson methods (only formulae). Problems. Finite differences, Interpolation using Newton's forward and backward difference formulae, Newton's divided difference formula and Lagrange's interpolation formula (All formulae without proof). Problems. Numerical integration: Trapezoidal, Simpson's (1/3)rd and (3/8)th rules (without proof). Problems. Self-Study: Bisection method, Lagrange's inverse Interpolation.   **8 Hrs.**

Unit-5

Numerical methods -2: Introduction to various numerical techniques for handling Computer Science & Engineering applications. Numerical Solution of Ordinary Differential Equations (ODE's): Numerical solution of ordinary differential equations of first order and first degree - Taylor's series method, Modified Euler's method, Runge-Kutta method of fourth order and Milne's predictor-corrector formula (No derivations of formulae).   **8 Hrs.**

Problems.

Self-Study: Adam-Bash forth method.

1)	Program to compute area, surface area, volume and centre of gravity
2)	Evaluation of improper integrals
3)	Finding gradient, divergent, curl and their geometrical interpretation
4)	Computation of basis and dimension for a vector space and Graphical representation of linear transformation
5)	Computing the inner product and orthogonality

6)	Solution of algebraic and transcendental equations by Ramanujan's, Regula-Falsi and Newton-Raphson method
7)	Interpolation/Extrapolation using Newton's forward and backward difference formula
8)	Computation of area under the curve using Trapezoidal, Simpson's (1/3)rd and (3/8)th rule
9)	Solution of ODE of first order and first degree by Taylor's series and Modified Euler's method
10)	Solution of ODE of first order and first degree by Runge-Kutta 4th order and Milne's predictor-corrector method

Reference Books:

1)   V. Ramana: "Higher Engineering Mathematics" McGraw-Hill Education, 11th Ed., 2017.

2)   Srimanta Pal &Subodh C. Bhunia: "Engineering Mathematics" Oxford University Press, 3rd Ed., 2016.

3)   N.P Bali and Manish Goyal: "A textbook of Engineering Mathematics" Laxmi Publications, 10th Ed., 2022.

4)   C. Ray Wylie, Louis C. Barrett: "Advanced Engineering Mathematics" McGraw – Hill Book Co., Newyork, 6th Ed., 2017.

5)   Gupta C.B, Sing S.R and Mukesh Kumar: "Engineering Mathematic for Semester I and II", Mc-Graw Hill Education(India) Pvt. Ltd 2015.

6)   H. K. Dass and Er. RajnishVerma: "Higher Engineering Mathematics" S. Chand Publication, 3rd Ed., 2014.

7)   James Stewart: "Calculus" Cengage Publications, 7th Ed., 2019.

8)   David C Lay: "Linear Algebra and its Applications", Pearson Publishers, 4th Ed., 2018.

9) Gareth Williams: "Linear Algebra with applications", Jones Bartlett Publishers Inc., 6th Ed., 2017.

22PHYS22	Physics for CSE Stream	(2-2-2-0)4

Contact Hours: 40

Course Learning Objectives:

- To study the essentials of photonics for engineering applications.
- To study the principles of quantum mechanics and its applications in quantum computing.
- To study the electrical properties of materials.
- To study the essentials of physics for computational aspects like design and data analysis.

Course Outcomes:

Description of the Course Outcome:	Mapping to POs(1-12)		
At the end of the course the student will be able to:	Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1 **Describe** the principles of LASERS and Optical fibers and their relevant applications.	1	2,12	-
CO-2 **Discuss** the basic principles of Quantum Mechanics and their application in Quantum Computing.	1,2	12	-
CO-3 **Summarize** the essential properties of superconductors and applications in Quantum Computing.	1,2	12	-
CO-4 **Illustrate** the application of physics in design and data analysis.	1	2,12	3,5
CO-5 **Practice** working in groups to conduct experiments in physics and **perform** precise and honest measurements.	1,8,9	2,5,12	3

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	3.0	2.4	1.0	-	1.5	-	-	3.0	3.0	-	-	2.0

Course Contents:

Unit-1

Laser and Optical Fibers: LASER: Basic properties of a LASER beam, **8 Hrs.** Interaction of Radiation with Matter, Einstein's A and B Coefficients, Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling. Numerical problems. Optical Fiber: Principle and structure, Acceptance angle and Numerical Aperture (NA) and derivation of Expression for NA, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems. Pre-requisite:Properties of light Self-learning: Total Internal Reflection & Propagation Mechanism (Optical Fibers)

Unit-2

Quantum Mechanics: de Broglie Hypothesis and Matter Waves, de Broglie **8 Hrs.** wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg's Uncertainty Principle and its application (Nonexistence of electron inside the nucleus-Non Relativistic), Principle of Complementarity, Wave Function, Time independent Schrodinger wave equation, Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one-dimensional infinite potential well, Waveforms and Probabilities. Numerical problems. Pre-requisite:Wave-Particle dualism Self-learning: de Broglie Hypothesis M

Unit-3

Quantum Computing: Wave Function in Ket Notation: Matrix form of wave **8 Hrs.** function, Identity Operator, Determination of I|0> and I|1>, Pauli Matrices and

its operations on 0 and 1 states, Mention of Conjugate and Transpose, Unitary Matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, Orthogonality Principles of Quantum Information & Quantum Computing: Introduction to Quantum Computing, Moore's law & its end. Single particle quantum interference, Classical & quantum information comparison. Differences between classical & quantum computing, quantum superposition and the concept of qubit. Properties of a qubit: Mathematical representation. Summation of probabilities, Representation of qubit by Bloch sphere Quantum Gates: Single Qubit Gates: Quantum Not Gate, Pauli -Z Gate Hadamard Gate, Pauli Matrices, Phase Gate 14.11.2022 2 (or S Gate), T Gate Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of, Swap gate, Controlled-Z gate, Toffoli gate, Accounting for the extra-ordinary capability of quantum computing, Model Realizations. Pre-requisites: Matrices. Self-learning: Moore's law

Unit-4

Electrical Properties of Materials and Applications Electrical conductivity **8 Hrs.** in metals, Resistivity and Mobility, Concept of Phonon, Matthiessen's rule. Introduction to Super Conductors, Temperature dependence of resistivity, Meissner's Effect, Silsbee Effect, Types of Superconductors, Temperature dependence of critical field, BCS theory (Qualitative), Quantum Tunneling, High Temperature superconductivity, Josephson Junction, DC and AC SQUIDs (Qualitative), Applications in Quantum Computing (Mention). Numerical problems. Pre-requisites: Basics of Electrical conductivity Self-learning: Resistivity and Mobility M

Unit-5

Applications of Physics in computing: Physics of Animation: Taxonomy of **8 Hrs.** physics-based animation methods, Frames, Frames per Second, Size and Scale, weight and strength, Motion and Timing in Animations, Constant

Force and Acceleration, The Odd rule, Motion Graphs, Numerical Calculations based on Odd Rule, Examples of Character Animation: Jumping, Walking. Numerical problems. Statistical Physics for Computing: Descriptive statistics and inferential statistics, Poisson distribution and Normal Distributions (Bell Curves), Monte Carlo Method. Numerical problems. Pre-requisites: Motion in one dimension Self-learning: Frames, Frames per Second

Reference Books:

1) Solid State Physics, S O Pillai, New Age International Private Limited, 8th Edition, 2018.

2) Engineering Physics by Gupta and Gour, DhanpatRai Publications, 2016 (Reprint).

3) Concepts of Modern Physics, ArthurBeiser, McGraw-Hill, 6th Edition, 2009.

4) Lasers and Non-Linear Optics, B B Loud, New age international, 2011 edition.

5) A textbook of Engineering Physics by M .N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.

6) Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition.

7) Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.

8) Engineering Physics, S P Basavaraj, 2005 Edition.

9) Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations,MariaLuisaDalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli,TrendsinLogic, Volume 48, Springer.

10) Statistical Physics: Berkely Physics Course, Volume 5, F. Reif, McGraw Hill.

11) Introduction to Superconductivity, Michael Tinkham, McGraww Hill, INC, II Edition.

12) Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.

22CED23	Computer Aided Engineering and Drawing	(2-0-2-0) 3

Contact Hours: 40

Course Learning Objectives (CLOs): This course focuses on the following learning perspectives:

- To understand the basic principles and conventions of engineering drawing
- To use drawing as a communication mode
- To generate pictorial views using CAD software
- To understand the development of surfaces
- To visualize engineering components

Course Outcomes (COs):

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	Draw and communicate the objects with definite shape and dimensions	1,5,10	2,12	6,8,9
CO-2	Recognize and Draw the shape and size of objects through different views	1,5,10	2,12	6,8,9
CO-3	Develop the lateral surfaces of the object	1,5,10	2,12	6,8,9
CO-4	Create a Drawing views using CAD software	1,2,5,10	--	6,7,9,12
CO-5	Identify the interdisciplinary engineering components or systems through its graphical representation.	1,5,10	2,12	9

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	3	2.6	-	-	3	1	1	1	1	3	-	1.7

Course Contents:

Unit-I

Introduction: Significance of Engineering drawing, BIS Conventions of Engineering Drawing, Free hand sketching of engineering drawing, Scales. Introduction to Computer Aided Drafting software, Co-ordinate system and reference planes HP, VP, RPP& LPP of 2D/3D environment. Selection of drawing sheet size and scale. Commands and creation of Lines, coordinate points, axes, polylines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet and curves. **8 Hrs**

Orthographic Projections of Points, Lines and Planes: Introduction to Orthographic projections: Orthographic projections of points in 1st and 3rd quadrants. Orthographic projections of lines (Placed in First quadrant only). Orthographic projections of planes viz triangle, square, rectangle, pentagon, hexagon, and circular laminae (Placed in First quadrant only using change of position method). Application on projections of Lines & Planes.

Unit-II

Orthographic Projection of Solids: Orthographic projection of right regular solids (Solids Resting on HP only): Prisms & Pyramids (triangle, square, rectangle, pentagon, hexagon), Cylinders, Cones, Cubes &Tetrahedron. Projections of Frustum of cone and pyramids. **8 Hrs**

Unit-III

Isometric Projections: Isometric scale, Isometric projection of hexahedron (cube), right regular prisms, pyramids, cylinders, cones and spheres. Isometric projection of combination of two simple solids. Conversion of simple isometric drawings into orthographic views. Problems on applications of Isometric projections of simple objects / engineering components. Introduction to drawing views using 3D environment. **8 Hrs**

Unit-IV

Development of Lateral Surfaces of Solids: Development of lateral surfaces of right regular prisms, cylinders, pyramids and cones resting with base on HP only. Development of lateral surfaces of their frustums and truncations. Problems on applications of development of lateral surfaces like funnels and **8 Hrs**

trays. Problems on applications of development of lateral surfaces of transition pieces connecting circular duct and rectangular duct.

Unit-V

Multidisciplinary Applications & Practice: **8 Hrs**

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

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

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

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

Electronics Engineering Drawings: Simple Electronics Circuit Drawings, practice on layers concept.

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

Reference Books:

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

2   Bhattacharya S. K., Electrical Engineering Drawing, New Age International publishers, second edition 1998, reprint 2005.

3   Chris Schroder, Printed Circuit Board Design using AutoCAD, Newnes, 1997.

4   K S Sai Ram Design of steel structures, , Third Edition by Pearson

5   Nainan p kurian Design of foundation systems, Narosa publications

6   A S Pabla, Electrical power distribution, 6th edition, Tata Mcgraw hill

7   Bhatt, N.D., Engineering Drawing: Plane and Solid Geometry, 53rd edition, Charotar Publishing House Pvt. Limited, 2019.

8   K. R. Gopalakrishna, &SudhirGopalakrishna: Textbook Of Computer Aided Engineering Drawing, 39th Edition, Subash Stores, Bangalore, 2017

| 22ESC243 | Introduction to Electronics Engineering | (3-0-0-0)3 |

Course Learning Objectives:

- To prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.

- To equip students with a basic foundation in electronic engineering required for comprehending the operation and application of electronic circuits, logic design, embedded systems, and communication systems.

- Professionalism & Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.

Course Outcomes (COs):

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Develop** the basic knowledge on construction and operation of rectifiers and amplifiers.	-	3	1
CO-2	**Apply** the acquired knowledge to construct small scale circuits consisting of oscillators and operational amplifiers.	-	1	-
CO-3	**Develop** the competence knowledge to construct basic digital circuit by making use of basic gates and its function.	-	1	3
CO-4	**Apply** the acquired knowledge to construct small scale embedded	-	1	12

		circuits.			
CO-5		**Study** the conceptual blocks of basic communication system and **acquire** the knowledge of analog and digital communication schemes.	-	1	12

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	1.8	-	1.5	-	-	-	-	-	-	-	-	1.0

Course Contents:

Unit-1

Power Supplies –Block diagram, Half-wave rectifier, Full-wave rectifiers **8 Hrs.** and filters, Voltage regulators, Output resistance and voltage regulation, Voltage multipliers. Amplifiers – CE amplifier with and without feedback, Multi-stage amplifier; BJT as a switch: Cutoff and saturation modes

Unit-2

Oscillators – Barkhausen criterion, sinusoidal and non-sinusoidal **8 Hrs.** oscillators, Ladder network oscillator, Wein bridge oscillator, Multi-vibrators, Single-stage astable oscillator, Crystal controlled oscillators (Only Concepts, working, and waveforms. No mathematical derivations) Operational amplifiers - Ideal op-amp; characteristics of ideal and practical op-amp; Practical opamp circuits: Inverting and non-inverting amplifiers, voltage follower, summer, subtractor, integrator, and differentiator.

Unit-3

Boolean Algebra and Logic Circuits: Binary numbers, Number Base **6 Hrs.** Conversion, octal &Hex Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates (Text 2: 1.2, 1.3, 1.4, 1.5,2.1, 2.2, 2.3,

2.4, 2.5, 2.6, 2.7) Combinational logic: Introduction, Design procedure, Adders- Half adder, Full adder (Text 2:4.1, 4.2, 4.3)

Unit-4

Embedded Systems – Definition, Embedded systems vs general computing **8 Hrs.** systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC Sensors and Interfacing – Instrumentation and control systems, Transducers, Sensors, Actuators, LED, 7-Segment LED Display. (Text 1)

Unit-5

Analog Communication Schemes – Modern communication system **8 Hrs.** scheme, Information source, and input transducer, Transmitter, Channel or Medium – Hardwired and Soft wired, Noise, Receiver, Multiplexing, Types of communication systems. Types of modulation (only concepts) – AM, FM, Concept of Radio wave propagation (Ground, space, sky) Digital Modulation Schemes: Advantages of digital communication over analog communication, ASK, FSK, PSK, Radio signal transmission Multiple access techniques. (Text 3)

Reference Books:

1) Mike Tooley, 'Electronic Circuits, Fundamentals & Applications',4th Edition, Elsevier, 2015.
2) Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008.
3) D P Kothari, I J Nagrath, 'Basic Electronics', 2nd edition, McGraw Hill Education (India),Private Limited, 2018.

22ETC25B	Introduction to Python Programming	(2-0-2-0) 3

Contact Hours: 40

Course Learning Objectives (CLOs): This course focuses on the following learning perspectives:

- Learn the syntax and semantics of the Python programming language.
- Illustrate the process of structuring the data using lists, tuples
- Appraise the need for working with various documents like Excel, PDF, Word and Others.
- Demonstrate the use of built-in functions to navigate the file system.
- Implement the Object Oriented Programming concepts in Python.

Course Outcomes (COs):

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	**Moderate Level (2)**	**Slight Level (1)**
CO-1	Demonstrate proficiency in handling loops and creation of functions.	-	**1, 2, 3**	-
CO-2	Identify the methods to create and manipulate lists, tuples and dictionaries.	-	**1, 2, 3**	-
CO-3	Develop programs for string processing and file organization	-	**1, 2, 3**	-
CO-4	Interpret the concepts of Object-Oriented Programming as used in Python.	-	**1, 2, 3**	-
CO-5	Demonstrate proficiency in handling loops and creation of functions.	-	**1, 2, 3**	-

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	2.0	2.0	2.0	-	-	-	-	-	-	-	-	-

Contents:

Unit-I

Python Basics: Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program, **Flow control:** Boolean Values, Comparison Operators, Boolean Operators,Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules,Ending a Program Early with sys.exit(), **Functions:** def Statements with Parameters, Return Values and return Statements,The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number

8 Hrs

Textbook 1: Chapters 1 – 3

Unit-II

Lists: The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples, References,

8 Hrs

Dictionaries and Structuring Data: The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things,

Textbook 1: Chapters 4 – 5

Unit-III

Manipulating Strings: Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup

8 Hrs

Reading and Writing Files: Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module,Saving Variables with the print.format() Function, Project: Generating Random Quiz Files, Project: Multi clipboard,

Textbook 1: Chapters 6 , 8

Unit-IV

Organizing Files: The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module,

Project: Renaming Files with American-Style Dates to European-Style

Dates, Project: Backing Up a Folder into a ZIP File,

Debugging: Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE"s Debugger.

Textbook 1: Chapters 9-10

Unit-V

Classes and objects: Programmer-defined types, Attributes, Rectangles, Instances   **8 Hrs** as return values, Objects are mutable, Copying,

Classes and functions: Time, Pure functions, Modifiers, Prototyping versus planning,

Classes and methods: Object-oriented features, Printing objects, Another example, A more complicated example,The init method, The __str__ method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation,

Textbook 2: Chapters 15 – 17

1. a. Develop a program to read the student details like Name, USN, and Marks in three subjects. Display the student details, total marks and percentage with suitable messages.

b. Develop a program to read the name and year of birth of a person. Display whether the person is a senior citizen or not.

2. a. Develop a program to generate Fibonacci sequence of length (N). Read N from the console.

b. Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).

3. Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages.

4. Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable message.

5. Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary with distinct words and their frequency of occurrences. Sort the dictionary in the reverse order of frequency and display dictionary slice of first 10 items]

6. Develop a program to sort the contents of a text file and write the sorted contents into a separate text file. [Hint: Use string methods strip(), len(), list methods sort(), append(), and file methods open(), readlines(), and write()].

7. Develop a program to backing Up a given Folder (Folder in a current working directory) into a ZIP File by using relevant modules and suitable methods.

8. Write a function named DivExp which takes TWO parameters a, b and returns a value c (c=a/b). Write suitable assertion for a>0 in function DivExp and raise an exception for when b=0. Develop a suitable program which reads two values from the console and calls a function DivExp.

9. Define a function which takes TWO objects representing complex numbers and returns new complex number with a addition of two complex numbers. Define a suitable class 'Complex' to represent the complex number. Develop a program to read N (N >=2) complex numbers and to compute the addition of N complex numbers.

10. Develop a program that uses class Student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint: Use list to store the marks in three subjects and total marks. Use __init__() method to initialize name, USN and the lists to store marks and total, Use getMarks() method to read marks into the list, and display() method to display the score card details

Reference Books:

1	Al Sweigart, "Automate the Boring Stuff with Python", 1ˢᵗ Edition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at https://automatetheboringstuff.com/) (Chapters 1 to 18, except 12) for lambda functions use this link: https://www.learnbyexample.org/python-lambda-function/
2	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at http://greenteapress.com/thinkpython2/thinkpython2.pdf (Chapters 13, 15, 16, 17, 18) (Download pdf/html files from the above link)

22ENG26	**Communicative English**	**(1-0-0-0)1**

Contact Hours: 15

Course Learning Objectives:

- To know about Fundamentals of Communicative English and Communication Skills in general.

- To train to identify the nuances of phonetics, intonation and enhance pronunciation skills for better Communication skills.

- To impart Basic English grammar and essentials of important language skills.

- To enhance with English vocabulary and language proficiency for better communication skills.

- To learn about Techniques of Information Transfer through presentation.

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Explain** and **apply** the Fundamentals of Communication Skills in their communication skills.	-	**10**	-
CO-2	**Identify** the nuances of phonetics, intonation and **enhance** pronunciation skills.	-	**10**	-
CO-3	**Impart** basic English grammar and essentials of language skills as per present requirement.	**10**	-	-
CO-4	**Explain** and **use** all types of English vocabulary and language proficiency.	-	**10**	-
CO-5	**Adopt** the Techniques of Information Transfer through presentation.	**10**	-	-

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	-	-	-	-	-	-	-	-	-	2.4	-	-

Course Contents:

Unit-1

Introduction to Communicative English : Communicative English, **03 Hrs.** Fundamentals of Communicative English, Process of Communication, Barriers to Effective Communicative English, Different styles and levels in Communicative English. Interpersonal and Intrapersonal Communication Skills.

Unit-2

Introduction to Phonetics: Phonetic Transcription, English Pronunciation,   **03 Hrs.**
Pronunciation Guidelines to consonants and vowels, Sounds
Mispronounced, Silent and Non silent Letters, Syllables and Structure. Word

Unit-3

Basic English Communicative Grammar and VocabularyPART- I: **03 Hrs.**
Grammar: Basic English Grammar and Parts of Speech, Articles and
Preposition. Question Tags, One Word Substitutes, Strong and Weak forms
of words, Introduction to Vocabulary, All Types of Vocabulary – Exercises on
it.

Unit-4

Basic English Communicative Grammar and Vocabulary PART - **03 Hrs.**
II: Words formation - Prefixes and Suffixes, Contractions and Abbreviations.
Word Pairs (Minimal Pairs) – Exercises, Tense and Types of tenses, The
Sequence of Tenses (Rules in use of Tenses) and Exercises on it.

Unit-5

Communication Skills for Employment: Information Transfer: Oral **03 Hrs.**
Presentation and its Practice. Difference between Extempore/Public
Speaking, Communication Guidelines. Mother Tongue Influence (MTI),
Various Techniques for Neutralization of Mother Tongue Influence. Reading
and Listening Comprehensions – Exercises.

Reference Books:

1)   Communication Skills by Sanjay Kumar &PushpLata, Oxford University Press India
     Pvt Ltd - 2019
2)   A Textbook of English Language Communication Skills, (ISBN-978-81-955465-2-
     7), Published by Infinite Learning Solutions, Bengaluru - 2022.
3)   Technical Communication by Gajendra Singh Chauhan and Et al, (ISBN-978-93-
     5350-050-4), Cengage learning India Pvt Limited [Latest Revised Edition] - 2019.
4)   English for Engineers by N.P.Sudharshana and C.Savitha, Cambridge University

Press – 2018.

5) English Language Communication Skills – Lab Manual cum Workbook, Cengage learning India Pvt Limited [Latest Revised Edition] – (ISBN-978-93-86668-45-5), 2019.

6) A Course in Technical English – D Praveen Sam, KN Shoba, Cambridge University Press – 2020.

7) Practical English Usage by Michael Swan, Oxford University Press – 2016.

Contact Hours: 15

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ - ಕನ್ನಡ ಬಲ್ಲ ಮತ್ತು ಕನ್ನಡ ಮಾತೃಭಾಷೆಯ ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ನಿಗದಿಪಡಿಸಿದ ಪಠ್ಯಕ್ರಮ

Course Title:	ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ		
Course Code:	22KSK17 / 27	CIE Marks	50
Course Type (Theory/Practical /Integrated	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

Course objectives : ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:
The course (22KSK17/27) will enable the students,
1. ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಪರಿಚಯಿಸಿವುದು.
3. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
4. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
5. ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

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

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

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

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

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

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

ಘಟಕ -3 ಆಧುನಿಕ ಕಾವ್ಯಭಾಗ   (03 hours of pedagogy)

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

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

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

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

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

University Prescribed Textbook :

ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ
ಡಾ. ಹಿ.ಚಿ.ಬೋರಲಿಂಗಯ್ಯ ಮತ್ತು ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ,
ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,
ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

ವಿಶೇಷ ಸೂಚನೆ : 1. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮಕ್ಕೆ ಸೀಮಿತವಾಗಿ ಅಂತಿಮ ಪರೀಕ್ಷೆಯ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ ಇರುತ್ತದೆ.

2. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮವನ್ನು ಹೊರತುಪಡಿಸಿದ ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿನ ಉಳಿದ ಪದ್ಯ & ಗದ್ಯ ಭಾಗ ಹಾಗೂ ಇತರ ಲೇಖನಗಳನ್ನು ಹೆಚ್ಚುವರಿ ಪೂರಕ ಓದಿಗಾಗಿ ಬಳಸಿಕೊಳ್ಳಬಹುದು. ಅಂತಿಮ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಈ ಪಾಠಗಳಿಂದ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲಾಗುವುದಿಲ್ಲ.

==

3. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.

4. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

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

CO1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಕುರಿತು ಅರಿವು ಮೂಡಿರುತ್ತದೆ.
CO2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಕಲಿತು ಹೆಚ್ಚಿನ ಓದಿಗೆ

	ಮತ್ತು ಜ್ಞಾನಕ್ಕೆ ಸ್ಫೂರ್ತಿ ಮೂಡುತ್ತದೆ.
CO3	ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ, ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಹೆಚ್ಚಾಗುತ್ತದೆ.
CO4	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯ ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ತಿಳಿದುಕೊಂಡು ನಾಡಿನ ಇನ್ನಿತರ ವ್ಯಕ್ತಿಗಳ ಬಗ್ಗೆ ತಿಳಿದುಕೊಳ್ಳಲು ಕೌತುಕತೆ ಹೆಚ್ಚಾಗುತ್ತದೆ.
CO5	ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

ಬಳಕೆ ಕನ್ನಡ - baLake Kannada (Kannada for Usage)

ಕನ್ನಡ ಕಲಿಕೆಗಾಗಿ <u>ನಿಗದಿಪಡಿಸಿದ</u> ಪಠ್ಯಪುಸ್ತಕ - (Prescribed Textbook to Learn Kannada)

Course Title:	ಬಳಕೆ ಕನ್ನಡ		
Course Code:	22KBK17 / 27	CIE Marks	50
Course Type (Theory/Practical /Integrated	Theory	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

Course objectives : ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

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

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

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

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

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

Module - 1   (03 hours of pedagogy)

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

Module - 2
<div align="right">(03 hours of pedagogy)</div>

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

Module - 3
<div align="right">(03 hours of pedagogy)</div>

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

Module- 4
<div align="right">(03 hours of pedagogy)</div>

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

Module - 5
<div align="right">(03 hours of pedagogy)</div>

1. ಕಾಲ ಮತ್ತು ಸಮಯದ ಹಾಗೂ ಕ್ರಿಯಾಪದಗಳ ವಿವಿಧ ಪ್ರಕಾರಗಳು -**Different types 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**

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	To Create the awareness regarding the necessity of learning local language for comfortable and healthy life.	6		10
CO-2	To enable learners to Listen and	6		10

	understand the Kannada language properly.										
CO-3	To speak, read and write Kannada language as per requirement.				6					10	
CO-4	To train the learners for correct and polite conservation.				6					10	
CO-5	To know about Karnataka state and its language, literature and General information about this state.				6					10	

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	-	-	-	-	-	3.0	-	-	-	1.0	-	-

University Prescribed Textbook :

ಬಳಕೆ ಕನ್ನಡ

ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ

ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ,

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

ಸೂಚನೆ :

ವಿಶೇಷ ಸೂಚನೆ : 1. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮಕ್ಕೆ ಸೀಮಿತವಾಗಿ ಅಂತಿಮ ಪರೀಕ್ಷೆಯ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ ಇರುತ್ತದೆ.

2. ಮೇಲಿನ ಪಠ್ಯಕ್ರಮವನ್ನು ಹೊರತುಪಡಿಸಿದ ಬಳಕೆ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿನ ಉಳಿದ ಭಾಗಗಳನ್ನು ಹೆಚ್ಚುವರಿ ಪೂರಕ ಓದಿಗಾಗಿ ಬಳಸಿಕೊಳ್ಳಬಹುದು. ಅಂತಿಮ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಈ ಪಾಠಗಳಿಂದ ಪ್ರಶ್ನೆಗಳನ್ನು ಕೇಳಲಾಗುವುದಿಲ್ಲ.

===

3. ಹೆಚ್ಚಿನ ಮಾಹಿತಿ ಮತ್ತು ವಿವರಣೆಗಳಿಗೆ ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ (9900832331) ಇವರನ್ನು ಸಂಪರ್ಕಿಸಿ.

4. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ, ಕೋರ್ಸ್ ಆಯ್ಕೆ ಮಾಹಿತಿ, ಅಧ್ಯಯನ ಸಾಮಗ್ರಿ & ಬಹು ಆಯ್ಕೆ ಮಾದರಿಯ ಪ್ರಶ್ನೆಗಳ ಕೈಪಿಡಿಗಾಗಿ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್ ಸೈಟ್ ನೋಡುವುದು.

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

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

21IDT28	Innovation and Design Thinking	(1-0-0-0)

Contact Hours: 15

Course Learning Objectives:

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

Course Outcomes:

Description of the Course Outcome: At the end of the course the student will be able to:		Mapping to POs(1-12)		
		Substantial Level (3)	Moderate Level (2)	Slight Level (1)
CO-1	**Appreciate** various design process procedure.	-	-	3
CO-2	**Generate** and **develop** design ideas through different technique	-	-	3
CO-3	**Identify** the significance of reverse Engineering to Understand products.	-	-	6
CO-4	**Draw** technical drawing for design ideas.	-	-	1

POs	1	2	3	4	5	6	7	8	9	10	11	12
Mapping Level	1.0	-	1.0	-	-	1.0	-	-	-	-	-	-

Course Contents:

Unit-1

Process Of Design Understanding Design thinking Shared model in team-   **03 Hrs**
based design – Theory and practice in Design thinking – Explore
presentation signers across globe – MVP or Prototyping

Unit-2

Tools for Design Thinking Real-Time design interaction capture and   **03 Hrs**
analysis – Enabling efficient collaboration in digital space – Empathy for
design – Collaboration in distributed Design

Unit-3

Design Thinking in IT Design Thinking to Business Process modeling –   **03 Hrs**
Agile in Virtual collaboration environment – Scenario based Prototyping

Unit-4

DT For strategic innovations Growth – Story telling representation –   **03 Hrs**
Strategic Foresight - Change – Sense Making - Maintenance Relevance –
Value redefinition - Extreme Competition – experience design -
Standardization – Humanization - Creative Culture – Rapid prototyping,
Strategy and Organization – Business Model design.

Unit-5

Design thinking workshop Design Thinking Work shop Empathize,   **03 Hrs**
Design, Ideate, Prototype and Test

Reference Books:

1) John.R.Karsnitz, Stephen O'Brien and John P. Hutchinson, "Engineering Design",
   Cengagelearning (International edition) Second Edition, 2013.
2) Roger Martin, "The Design of Business: Why Design Thinking is the Next
   Competitive Advantage", Harvard Business Press, 2009.
3) HassoPlattner, ChristophMeinel and Larry Leifer (eds), "Design Thinking:
   Understand – Improve – Apply", Springer, 2011.

4) IdrisMootee, "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School", John Wiley & Sons 2013.

5) YousefHaik and Tamer M.Shahin, "Engineering Design Process", Cengage Learning, Second Edition, 2011.

6) Book - Solving Problems with Design Thinking - Ten Stories of What Works (Columbia Business School Publishing) Hardcover – 20 Sep 2013 by Jeanne Liedtka (Author), Andrew King (Author), Kevin Bennett (Author).

CIE for Non-integrated Courses: With LTP 3-0-0 and 4-0-0 or 2-2-0/3-2-0

- ➢ Two tests + One Improvement test : (20+20+20 each of one hour duration)
- ➢ Two higher scores from three tests are taken representing 40 marks
- ➢ QP pattern: 3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub divisions.
- ➢ CTA: Minimum two components such as assignments, quiz, seminar, written assignment, any technical activity related to course etc. each of 5 marks. Total CTA marks- 10
- ➢ CIE= 40(from tests)+10(from CTA) = 50 marks
- ➢ SEE: Exam will be conducted for 100 marks with 3 hour's duration and will be scaled down to 50 marks. Five modules with built in choice. Each question can be with maximum of three sub divisions.

CIE for Integrated Courses :With LTP 2-0-2 and 3-0-2 and 2-2-2

Theory CIE component:

- ➢ Two tests + One Improvement test (20+20+20 each of one hour duration)
- ➢ Two higher scores from three tests are taken representing 40 marks
- ➢ QP pattern: 3 questions- Q.3 is compulsory and one question to be answered from Q.1 and Q.2, each question can be with maximum of two sub divisions.
- ➢ Practical CIE component (CTA): Laboratory component. 5 marks for conduction, regularity, involvement, journal etc. Lab Test -5 marks. A test as per the schedule announced will be conducted at the end for 50 marks and scaled down to 5 marks. If the performance is not satisfactory in laboratory the student shall be detained and required to reregister for the course as a whole whenever offered next.
- ➢ CIE= 40(from tests) +10(from CTA i.e. lab component) = 50 marks
- ➢ SEE: Exam will be conducted for 100 marks with 3 hour's duration and will be scaled down to 50 marks. Five modules with built in choice. Each question can be with maximum of three sub divisions. The questions shall be asked to test

practical understanding for maximum of 30 marks.

CIE for AEC/HSMS/SDC Courses :With LTP 1-0-0 for 1 Credit

➢ CIE for 1 credit AEC/HSMS Courses with LTP 1-0-0

➢ Two tests + One Improvement test

➢ 20+20+20 each of one hour duration

➢ QP pattern for IA: MCQ 15 questions

➢ Two higher scores from three tests are taken representing 40 marks

➢ CTA: Minimum two components such as assignments ,quiz, seminar, written assignment , any learning activity related to the course etc. each of 5 marks.

➢ CIE= 40(from tests)+10(from CTA)= 50 marks

➢ SEE: Exam will be conducted for 50 marks with 1 hour duration. There will be 50 MCQs. The question paper will contain 10 MCQ questions from each module.