



CHRIST COLLEGE OF ENGINEERING IRINJALAKUDA (AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND BUSINESS SYSTEMS

SYLLABUS

2026 REGULATION



A CMI INSTITUTION

**CHRIST COLLEGE OF ENGINEERING
(AUTONOMOUS)**

**DEPARTMENT OF COMPUTER
SCIENCE AND BUSINESS SYSTEMS**

SYLLABUS

SEMESTER – S1

(GROUP - A)

2026 REGULATION

Approved by BoS meeting held on: 16-06-2026

Approved by Academic Council meeting held on: 23-06-2026


BoS Chairperson
Dr. Divya R


Director of Academics
Dr. Manoj George


Principal
Dr. Solomon P.A.

CHAIRPERSON
Board of Studies
B.Tech Computer Science &
Business Systems
Christ College of Engineering
(Autonomous)
Irinjalakuda, Kerala

(College seal)



Principal
Christ College of Engineering
(Autonomous)
Irinjalakuda - 680 129

FIRST SEMESTER: Computer Science and Business Systems														
10 Days Compulsory Induction Program														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./Week
						L	T	P	R		CIA	ESE		
THEORY														
1	A	G26LAT101	BS	GC	Linear Algebra	3	0	0	0	4.5	40	60	3	3
2	B	G26PHE112	BS	GC	Modern Engineering Physics	3	0	2	0	5.5	40	60	4	5
3	C	G26IST103	BS	GC	Introductory Topics in Statistics and Probability	3	0	0	0	4.5	40	60	3	3
4	D	G26ELT108	ES	GC	Basics of Electrical and Electronics Engineering	4	0	0	0	6.0	40	60	4	4
5	E	B26FPE105	ES	GC	Fundamentals of Programming	2	1	2	0	4.5	40	60	4	5
PRACTICALS														
6	G	G26EWP112	ES	GC	Electrical and Electronics Workshop Practice	0	0	2	0	1	50	50	1	2
7	H	B26BCP106	BS	CC	Business Communication & Value Science - I	0	0	2	0	1	50	-	1	2
MANDATORY COURSES														
8	I	B26IKT108	MC	CC	Indian Knowledge System	2	0	0	0	3	40	60	2	2
9	-	A26APP115	MC	CC	Activity Point Programme ^s									
Total										30			22	26

SEMESTER S1

LINEAR ALGEBRA

Course Code	G26LAT101	CIE Marks	40
Teaching Hours/Week (L:T:P:R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. and 30 Mins.
Prerequisites (if any)	Basic knowledge in single variable calculus and matrix operations.	Course Type	Theory

Course Objective:

1. To provide a comprehensive understanding and basic techniques of matrix theory to analyze linear systems.
2. To develop necessary skills to effectively utilize linear algebra in advanced studies and professional practice.

SYLLABUS

Module No.	Description	Contact Hours
1	Linear system of equations, Gauss elimination method, Rank of a Matrix, Homogeneous and Non Homogeneous linear system, LU Decomposition	9
2	Eigen values and Eigen vectors, Properties of Eigen values, Diagonalisation, Quadratic forms, Hermitian and Unitary Matrices, Singular value decomposition and Principal component analysis. Introduction to their applications in Image processing and Machine Learning.	9
3	Vector Spaces, Subspaces, Linear combinations of vectors in a vector space, Spanning sets, Linear dependence and independence, Basis for a	9

	vector space, The dimension of vector space, Coordinate representation in R^n , Change of basis in R^n .	
4	Vector length and unit vector, Dot product and angle between two vectors, The Cauchy- Schwarz Inequality, Orthogonal and orthonormal sets, Orthogonal orthonormal basis, Gram-Schmidt orthonormalization process.	9

Course Assessment Method
(CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Assignment (Activity based)	Internal Examination-I (Written)	Internal Examination-II (Written)	Internal Examination-III (Written)	Total
15	30	30	30	
	Average of best two then convert to 25			40

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

Part A	Part B	Total
2 questions from each module. - Total of 8 questions, each carrying 3 marks (8 x 3 = 24 Marks)	- Each question carries 9 marks. - Two questions will be given from each module, out of which 1 question should be answered. - Each question can have a maximum of 3 sub divisions. (4 x 9 = 36 Marks)	60

Course Outcomes (Cos)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Solve the system of linear equations and apply these concepts to real-world problems in various fields	3
CO2	Calculate eigenvalues and eigenvectors to analyze the behavior of linear transformations in real-world problems.	4

CO3	Apply the concept of vector spaces and subspaces to determine their properties, including linear independence, span, basis, and dimension.	3
CO4	Analyse the set of vectors their linearly independence, orthogonality and orthonormalization.	4
CO5	Analyze, develop and make use of theoretical concepts to solve complex problems and visualize the output.	4

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 - Create

CO-PO MAPPING MATRIX

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO1	3	3	2	1	1								
CO2	3	3	2	1	1								
CO3	3	3	2	1	1								
CO4	3	3	2	1	1								
CO5	3	3	2	2	3				1	1			

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Higher Engineering Mathematics	, B.S Grewal	Khanna Publishers	

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Advanced Engineering Mathematics	Peter V O'Neil	Cengage Learning	Seventh edition
2	Advanced Engineering Mathematics	Michael D Grenberg	Pearson	Seventh edition
3	Introduction to linear Algebra	Gilbert Strang	Wellesley – Cambridge Press	Fifth Edition

Video Links (NPTEL, SWAYAM, etc.)

Module No.	Link
1	https://nptel.ac.in/courses/111106135
2	https://nptel.ac.in/courses/111106051
3	https://nptel.ac.in/courses/111106135 https://nptel.ac.in/courses/111106051
4	https://nptel.ac.in/courses/111106135 https://nptel.ac.in/courses/111106051

SEMESTER S1**MODERN ENGINEERING PHYSICS**

Course Code	G26PHE112	CIE Marks	40
Teaching Hours/Week (L:T:P:R)	3:0:2:0	ESE Marks	60
Credits	4	Exam Hours	2 Hrs. and 30 Mins.
Prerequisites (if any)	None	Course Type	Theory + Lab

Course Objective:

1. To equip students with a strong foundation in the fundamentals of Physics, impart this knowledge within the context of Information Science disciplines, cultivate scientific attitudes and critical thinking skills, and enable students to integrate Physics concepts with their core Information Science programs.
2. To make students gain practical knowledge to correlate the theoretical studies and to develop practical applications of engineering.

SYLLABUS

Module	Content	Hours
I	Quantum Mechanics Introduction, Concept of uncertainty and conjugate observables (qualitative), Uncertainty principle (statement only), Application of uncertainty principle- Absence of electron inside nucleus - Natural line broadening, Wave function – properties - physical interpretation, Formulation of time dependent and time independent Schrodinger equations, Particle in a one- dimensional box - Derivation of energy eigen values and normalized wave function, Quantum Mechanical Tunnelling (qualitative), Quantum Computing (qualitative).	9
II	Electrical conductivity Classical free electron theory, Electrical conductivity in metals, Fermi Dirac distribution, Variation of Fermi function with temperature, Fermi Energy, Energy bands, Classification of materials into conductor, semiconductor and insulator. Superconductivity, Transition temperature, Critical field, Meissner effect, Type I and Type II Superconductors, BCS theory, Applications of superconductors.	9

III	Semiconductor Physics Intrinsic semiconductor, Derivation of density of electrons in conduction band and density of holes in valence band, Intrinsic carrier concentration, Variation of Intrinsic carrier concentration with temperature, Extrinsic semiconductor (qualitative). Formation of p-n junction, Fermi level in semiconductors-intrinsic and extrinsic, Energy band diagram of p-n junction - Qualitative description of charge flow across a p-n junction - Forward and reverse biased p-n junctions, Diode equation, I-V Characteristics of p-n junction	9
IV	Optics and Photonics Optic fibre-Principle of propagation of light, Types of fibres-Step index and Graded index fibres, Acceptance angle, Numerical aperture - Derivation, Optic fibre communication (block Diagram), Applications of optical fibres – Optic fibre sensors Photonic devices (Qualitative treatment only) - Photo detectors (Junction and PIN photodiodes), Solar cells-IV Characteristics, Efficiency, Light Emitting Diode, Applications	9

Course Assessment Method (CIE: 40 Marks, ESE: 60 Marks)

Continuous Internal Evaluation Marks (CIE):

Continuous Assessment	Internal Examination -I (Written)	Internal Examination -II (Written)	Internal Examination -III (Written)	Internal Lab Examination	Total
10	30	30	30	10	
	Average of best three then convert to 20				40

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

Part A	Part B	Total
2 questions from each module. - Total of 8 questions, each carrying 3 marks (8 x 3 = 24 Marks)	- Each question carries 9 marks. - Two questions will be given from each module, out of which 1 question should be answered. - Each question can have a maximum of 3 subdivisions. (4 x 9 = 36 Marks)	60

Course Outcomes (COs)

At the end of the course students should be able to:

CO No.	Description	Bloom's Knowledge Level (KL)
CO1	Analyse the behaviour of matter in atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.	4
CO2	Apply the basic theory of electrical conductivity and superconductivity to evaluate conductive materials in engineering for sustainable applications.	3
CO3	Apply the fundamentals of semiconductor physics to analyse material properties for producing clean energy.	3
CO4	Analyze the principles of optical fibers and photonic devices, and evaluate their applications in communication, medical, industrial, and clean energy systems.	4
CO5	Apply scientific principles in an engineering context, training students through hands-on learning to promote quality education.	3
CO6	Apply fundamental principles of physics to analyze and interpret experimental results using software tools and simple electronic assemblies.	4

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 – Create

CO-PO MAPPING MATRIX

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PSO1	PSO2
CO1	3	2											
CO2	3	2											
CO3	3	2											
CO4	2	2											
CO5	2	2			3	3		3	3		2		
CO6	2	2		3	3	3		3	3		2		

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Engineering Physics	H K Malik and A K Singh	McGraw Hill	2 nd Edition, 2017
2	Concepts of Modern Physics	Arthur Beiser	Tata McGraw Hill	6 th Edition, 2003
3	A Textbook of Engineering Physics	MN Avadhanulu, P G Kshirsagar, TVS Arun Murthy	S. Chand	11 th Edition, 2018

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Semiconductor Devices Fundamentals	Robert F Pierret	Pearson Education	1995
2	Advanced Semiconductor Fundamental	Robert F Pierret	Pearson Education	2 nd Edition, 2002
3	Solid State Electronic Devices	Ben G Streetman and Sanjay Kumar Banerjee	Pearson Education	6 th Edition, 2010
4	Solid State Physics	S.O. Pillai	New Age International	10 th Edition, 2022
5	Introduction to Solid State Physics	Charles Kittel	Wiley India Edition	2019
6	Advanced Engineering Physics	Premlet B	Phasor Books	10 th Edition, 2017
7	A Text Book of Engineering Physics	I. Dominic and A. Nahari	Owl Books	Revised Edition, 2016

Video Links (NPTEL, SWAYAM, etc.)

Module No.	Link
1	https://nptel.ac.in/courses/115103108

2	https://nptel.ac.in/courses/115101107 https://nptel.ac.in/courses/115102023
3	https://nptel.ac.in/courses/108106181
4	https://nptel.ac.in/courses/108108112

Continuous Assessment (10 Marks)

- i. **Preparation and Pre-Lab Work (2 Marks)**
 - Pre-Lab Assignments: Assessment of pre-lab assignments or quizzes that test understanding of the upcoming experiment.
 - Understanding of Theory: Evaluation based on students' preparation and understanding of the theoretical background related to the experiments.
- ii. **Conduct of Experiments (2 Marks)**
 - Procedure and Execution: Adherence to correct procedures, accurate execution of experiments, and following safety protocols.
 - Skill Proficiency: Proficiency in handling equipment, accuracy in observations, and troubleshooting skills during the experiments.
 - Teamwork: Collaboration and participation in group experiments.
- iii. **Lab Reports and Record Keeping (3 Marks)**
 - Quality of Reports: Clarity, completeness and accuracy of lab reports. Proper documentation of experiments, data analysis and conclusions.
 - Timely Submission: Adhering to deadlines for submitting lab reports/rough record and maintaining a well-organized fair record.
- iv. **Viva Voce (3 Marks)**
 - Oral Examination: Ability to explain the experiment, results and underlying principles during a viva voce session.

Final Marks Averaging: The final marks for preparation, conduct of experiments, viva, and record are the average of all the specified experiments in the syllabus.

Evaluation Pattern for Lab Examination (10 Marks)

1. **Procedure/Preliminary Work/Conduct of Experiments (4 Marks)**
 - Procedure Understanding and Description: Clarity in explaining the procedure and understanding each step involved.
 - Preliminary Work and Planning: Thoroughness in planning and organizing materials/equipment.
 - Setup and Execution: Proper setup and accurate execution of the experiment or programming task
2. **Result (4 Marks)**
 - Accuracy of Results: Precision and correctness of the obtained results.
3. **Viva Voce (2 Marks)**
 - Proficiency in answering questions related to theoretical and practical aspects of the subject.

Experiment List (Minimum 10 Experiments)

Experiment No.	Experiment
1	Diode characteristics
2	Zener diode- V-I characteristics
3	Tunnel diode –V-I characteristics
4	Half wave rectifier
5	Full wave rectifier
6	Hall effect in semiconductors
7	Determination of band gap energy of a semiconductor
8	Characteristics of LED
9	Solar Cell- V-I and Intensity Characteristics
10	Laser – Determination of wavelength using diffraction grating
11	Laser- To measure the wavelength using a millimetre scale as a grating

12	Compare the variation of current with potential difference, for a metal, filament bulb and semiconductor diode.
13	Determination of dielectric constant
14	CRO -Measurement of frequency and amplitude of wave forms
15	Photo diode - V-I Characteristics

SEMESTER-S1

INTRODUCTORY TOPICS IN STATISTICS AND PROBABILITY

Course Code	G26IST103	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hr. 30 Min.
Prerequisites (if any)	Basic calculus	Course Type	Theory

Objective

To provide students with a fundamental understanding of statistical methods, probability theory and probability distributions enabling them to analyze data, model uncertainty, and apply mathematical techniques to solve engineering and business-related problems.

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Introduction to Statistics: Definition of Statistics. Basic objectives. Applications in various branches of science with examples. Collection of Data: Primary and secondary Data. Population and sample, Representative sample. Classification and tabulation of univariate data, graphical representation, Frequency curves.	9
2	Descriptive Statistics: Descriptive measures – Measures of central tendency: Arithmetic Mean, Geometric Mean, Harmonic Mean, Median and Mode. Measure of Dispersion: Absolute and Relative Measures of Dispersion, Range, Quartile Deviation, Mean Deviation and Standard Deviation.	9
3	Probability, Random Variables and Probability Distributions: Concept of experiments, sample space, event. Definition of Combinatorial Probability. Conditional Probability, Bayes Theorem. Probability distributions: discrete & continuous distributions. Expected values: mathematical expectation, variance and its properties, Moment generating function.	9

4	Standard and Sampling Probability Distributions and Calculus: Standard Distributions-Discrete: Binomial, Poisson and Geometric distributions; Standard Distributions- Continuous: Uniform, Exponential and Normal distributions. Sampling Distributions: Chi-square, t and F distributions (Basic Concepts only).	9
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Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE)

Assignme nt/ Microproj ect	Internal Examinati on (Written)	Internal Examinati on (Written)	Internal Examinatio n (Written)	Total
15	30	30	30	40
	Total 90 marks will be converted to 25			

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Tot al
2 Questions from each module. - Total of 8 Questions, each carrying 3 marks (8x3 =24marks)	- Each question carries 9 marks. - Two questions will be given from each module, out of which 1 question should be answered. - Each question can have a maximum of 3 sub divisions. (4x9 = 36 marks)	60

COURSE OUTCOMES (COs)

CO	CO Statement	SDG	Modules	Blooms name and Level
CO1	Apply the fundamental concepts, objectives, applications of statistics, and methods of data collection, classification, tabulation, and graphical representation of data..	SDG 4	1	K3
CO2	Apply appropriate measures of central tendency and dispersion to summarize, compare, and interpret datasets in practical situations.		2	K3
CO3	Analyze random phenomena using probability concepts, conditional probability, Bayes' theorem, random variables, and probability distributions to evaluate uncertainty and support decision-making.		3	K4
CO4	Analyze real-world problems using standard probability distributions, sampling distributions, and differential and integral calculus techniques to develop suitable mathematical models and interpretations.		4	K4
CO5	Apply statistical, probabilistic, and calculus-based methods to investigate and solve engineering, business, and data-driven problems encountered in real-world scenarios.			K3

CO PO Mapping Table

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

Text Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	<i>Introduction of Probability Models</i>	S M Ross	Academic Press	11 th Edition 2014
2	<i>Fundamentals of Statistics</i>	A. Goon, M. Gupta and B. Dasgupta	World Press	Vol I and II 2013 and 2014
3	<i>Higher Engineering Mathematics</i>	B. S. Grewal	Khanna Publication	45 th Edition 1965

Reference Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	<i>A first course in Probability</i>	S. M. Ross	Pearson Education	10 th Edition 2023
2	Probability and Statistics for Engineers	I.R. Miller, J.E. Freund and R. Johnson	Pearson College	2016

3	Introduction to the Theory of Statistics	A. M. Mood, F.A. Graybill and D.C. Boes	McGraw Hill Higher Education	3 rd Edition 1974
4	Advanced Engineering Mathematics	Peter V. O'Neil	Cengage Learning India Pvt. Ltd.	2023
5	Advanced Engineering Mathematics	M. D. Greenberg	Pearson Education	2 nd Edition 2024
6	Applied Mathematics, Vol. I & II	P. N. Wartikar and J. N. Wartikar	Vidyarthi Prakashan	

SEMESTER S1

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Code	G26ELT108	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	4:0:0:0	ESE Marks	60
Credits	4	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

1. Develop an awareness on the fundamentals of electric power generation, transmission and distribution
2. Apply fundamental concepts and circuit laws to solve simple DC/AC electric circuits and compare the performance of AC and DC motors
3. To provide students with a fundamental understanding of passive, active electronic components and develop an understanding of communication systems, electronic instrumentation, and modern electronic technologies.

SYLLABUS

Module No.	Syllabus Description	Contact Hours
	Generation of alternating voltages: - Faradays laws of Electromagnetic induction, Elementary Generator, Representation of ac voltage and currents, sinusoidal waveforms: frequency, period average, RMS values and form factor of waveform (Simple numerical problems based on sinusoidal waveforms)	

1	DC Circuits: Resistance in Series and Parallel, Ohms Law and Kirchhoff's laws, Voltage and current divider rule. Mesh analysis, Nodal analysis (Simple numerical problems) AC circuits: Purely resistive, inductive and capacitive circuits; Inductive and capacitive reactance, concept of impedance. (Simple numerical problems) Power in AC circuits – Power factor; active, reactive and apparent power in single phase system. (Simple numerical problems) Measuring the Current, voltage and power of simple DC circuits using MATLAB software	12
2	Generation of electrical energy: Conventional Sources: Hydro, thermal, nuclear plants (Block diagram description) Introduction to non-conventional energy sources: solar and wind Three phase AC systems: Three phase 3 wire and 4 wire systems, Transmission System, Distribution system: Feeder, distributor, service mains. Representation of three phase voltages; star and delta connections (balanced only), relation between line and phase voltages, line and phase currents, Power factor; active, reactive and apparent power in Three phase system. (Simple numerical problems) Transformers. Principle of operation, step-up and step-down transformers Types of Motors – Principle of Operation of DC motor: Block diagram showing power stages, losses and efficiency. Electric Vehicle - Block diagram representation. Types of motors used in Electric vehicles.	12

3	Introduction to Electronic devices: Passive and active components in electronics- Resistors, Capacitors and Inductors(constructional features not required): types, specifications. Standard values, colour coding. Working of PN junction diode, V-I characteristics of PN Junction diode, Zener diode and avalanche breakdown. Basics of Zener voltage regulator, Block diagram of DC power supply, circuit and working of half wave, full wave and bridge rectifiers, ripple factor (with and without capacitor filters) Construction, working and V-I Characteristics of BJT, Input output characteristics of CE configuration, Comparison of CE, CB and CC configurations. Concept of biasing and load line Transistor as a switch, RC coupled amplifier - Circuit diagram and frequency response .	11
4	Modern Electronics and its applications: General block diagram of a Communication system, Concept of AM and FM (No derivation required), Block diagram of AM and FM super-heterodyne receiver, Basic concepts of Wired and Wireless communication, Block diagram of Fiber optic Communication system, Concept of Cell & cluster, Block diagram of GSM Comparison of 3G, 4G, 5G and 6G communication technologies Block diagrams of electronic instrumentation system, Digital Multimeter, Function generator Introduction to CRO and Lissajous patterns Applications of modern electronics – IoT based smart homes, healthcare and agriculture (Case study only).	10

**Course Assessment
Method (CIE: 40 marks,
ESE: 60 marks)**

Continuous Internal Evaluation Marks (CIE):

Assignment	Internal Examination-1 (Written)	Internal Examination - 2 (Written)	Internal Examination - 3 (Written)	Total
15	30	30	30	40
	A total of 90 marks will be scaled to 25			

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks (8x3 =24marks)	• 2 questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 2 subdivisions. • Each question carries 9 marks (4x9 = 36 marks)	60

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome	Bloom's Knowledge Level (KL)	Wks Addressed	SDGs

CO1	Apply fundamental concepts and circuit laws to solve simple DC and AC electric circuits and acquire a knowledge on circuit solving using MATLAB	Analyze, Apply, Understand	1,2,3,4	7 and 9
CO2	Develop an awareness on the fundamentals of electric power generation, transmission, distribution and electric vehicles	Understand, Remember	1,3,4	
CO3	Design basic electronic circuits with the knowledge of passive and active electronic components	Apply, Understand	1,3,4	
CO4	Distinguish the principles of various Communication systems, electronic instruments and apply knowledge of modern electronics to study case studies related to IoT applications in smart homes, healthcare and agriculture	Understand, Remember	1,3,4	
CO5	Design and Develop applications of modern electrical & electronics systems in contemporary world	Create, Analyse, Apply	1,2,3,4	

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create
Mapping Table (Mapping of Course Outcomes to Program Outcomes)

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

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Basic Electrical Engineering	D P Kothari and I J Nagrath	Tata McGraw Hill	4th Edition 2019

2	Schaum's Outline of Basic Electrical Engineering	J.J.Cathey and Syed A Nasar	Tata McGraw Hill	3rd Edition 2010
3	Basic Electronics: Principles and Applications	Chinmoy Saha, Arindham Halder and Debarati Ganguly	Cambridge University Press	1 st Edition, 2018
4	Basic Electrical and Electronics Engineering	D. P. Kothari and I. J. Nagrath	McGraw Hill	2 nd Edition, 2020
5	The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World	Michael Miller	QUE	1 st Edition, 2015
6	Basic Electronics and Linear Circuits	N N Bhargava D C Kulshreshtha and S. C. Gupta	McGraw Hill	2 nd Edition, 2017
7	Electronic Communication Systems	Kennedy and Davis	McGraw Hill	6 th Edition, 2017

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	Basic Electrical Engineering	D C Kulshreshtha	Tata McGraw Hill	2 nd Edition, 2019

2	Electrical Engineering Fundamentals	Del Toro V	Pearson Education	2nd Edition, 2019
3	Basic Electrical Engineering	T. K. Nagsarkar, M. S. Sukhija	Oxford Higher Education	3rd Edition, 2017
4	Electronics: A Systems Approach	Neil Storey	Pearson	6th Edition, 2017
5	Electronic Devices and Circuit Theory	Robert L. Boylestad and Louis Nashelsky	Pearson	11th Edition 2015

Video Links (NPTEL, SWAYAM...)	
No.	Link ID
1	Electricity and Electrical Wiring - Course
2	EST130 Basic Electrical & Electronics Engineering syllabus overview

SEMESTER S1

FUNDAMENTALS OF PROGRAMMING

Course Code	B26FPE104	CIE Marks	40
Teaching Hours/Week (L:T:P:R)	2:1:2:0	ESE Marks	60
Credits	4	Exam Hours	2 Hrs. and 30 Mins.
Prerequisites (if any)	NIL	Course Type	Theory

Course Objective:

- To introduce the fundamentals of algorithmic problem solving and programming using ANSI C.
- To equip students with skills in modular programming, data handling, file processing, and Unix system programming for developing efficient software solutions.

SYLLABUS

Module No.	Description	Contact Hours
1	General problem Solving concepts: Algorithm, and Flowchart for problem solving with Sequential Logic Structure, Decisions and Loops. Imperative languages: Introduction to imperative language; syntax and constructs of a specific language (ANSI C) Input and Output: Standard I/O, Formatted Output – printf, Formated Input – scanf, Variable length argument list, Types Operator and Expressions with discussion of variable naming and Hungarian Notation: Variable Names, Data Type and Sizes (Little Endian Big Endian), Constants, Declarations, Arithmetic Operators, Relational Operators, Logical Operators, Type Conversion, Increment Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Precedence and Order of Evaluation, proper variable naming and Hungarian Notation.	9

2	Control Flow with discussion on structured and unstructured programming: Statements and Blocks, If-Else-If, Switch, Loops – while, do, for, break and continue, goto labels, structured and un- structured programming. Functions and Program Structure with discussion on standard library: Basics of functions, parameter passing and returning type, C main return as integer, External, Auto, Local, Static, Register Variables, Scope Rules, Block structure, Initialisation, Recursion, Pre-processor, Standard Library Functions and return types.	9
3	Pointers and Arrays: Pointers and address, Pointers and Function Arguments, Pointers and Arrays, Address Arithmetic, character Pointers and Functions, Pointer Arrays, Pointer to Pointer, Multi-dimensional array and Row/column major formats, Initialisation of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they are evaluated.	9
4	Structures: Basic Structures, Structures and Functions, Array of structures, Pointer of structures, Self-referral structures, Table look up, typedef, unions, Bit-fields. File access including FILE structure, fopen, stdin, stdout and stderr, Error Handling including exit, perror and error.h, Line I/O, related miscellaneous functions. Unix system Interface: File Descriptor, Low level I/O – read and write, open, create, close and unlink, Random access – lseek, Discussions on Listing Directory, Storage allocator. Programming Method: Debugging, Macro, User Defined Header, User Defined Library Function, makefile utility.	9

LIST OF EXPERIMENTS	
1	Familiarization of Hardware Components of a Computer
2	Familiarization of Linux environment – How to do Programming in C with Linux
3	Familiarization of console I/O and operators in C i. Display “Hello World”. ii. Read two numbers, add them and display their sum. iii. Read the radius of a circle, calculate its area and display it. iv. Evaluate the arithmetic expression $((a - b / c * d + e) * (f + g))$ and display its solution. Read the values of the variables from the user through the console. v. Read 3 integer values and find the largest among them. vi. Read a Natural Number and check whether the number is prime or not. vii. Read a Natural Number and check whether the number is Armstrong or not. viii. Read n integers, store them in an array and find their sum and average.
4	Read n integers, store them in an array and search for an element in the array using an algorithm for Linear Search.
5	Read n integers, store them in an array and sort the elements in the array using Bubble Sort Algorithm.
6	Read a string (word), store it in an array and check whether it is a palindrome word or not.
7	Read two strings (each one ending with a \$ symbol), store them in arrays and concatenate them without using library functions.
8	Read a string (ending with a \$ symbol), store it in an array and count the number of vowels, consonants and spaces in it.
9	Read two inputs each representing the distances between two points in the Euclidean space, store these in structure variables and add the two distance values.
10	Using structure, read and print data of n employees (Name, Employee Id and Salary)
11	Declare a union containing 5 string variables (Name, House Name, City Name, State and Pin code) each with a length of C_SIZE (user defined

	constant). Then, read and display the address of a person using a variable of the union.
12	Find the factorial of a given Natural Number n using recursive and non-recursive functions.
13	Read a string (word), store it in an array and obtain its reverse by using a user defined function.
14	Write a menu driven program for performing matrix addition, multiplication and finding the transpose. Use functions to (i) read a matrix, (ii) find the sum of two matrices, (iii) find the product of two matrices, (iv) find the transpose of a matrix, and (v) display a matrix.
15	Do the following using pointers: i) Add two numbers ii) Swap two numbers using a user defined function.
16	Input and print the elements of an array using pointers.
17	Compute sum of the elements stored in an array using pointers and user defined functions.
18	Create a file and perform the following: iii) Write data to the file iv) Read the data in a given file and display the file content on console v) Append new data and display on console
19	Open a text input file and count the number of characters, words and lines in it; and store the results in an output file.

Course Assessment Method (CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Continuou s Assessment	Internal Examination- I (Written)	Internal Examination- II (Written)	Internal Examination -III (Written)	Lab Examination	Total
10	30	30	30	10	40

	A total of 90 marks will be scaled to 20.		
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End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions.

Part A	Part B	Total
2 questions from each module. - Total of 8 questions, each carrying 3 marks (8 x 3 = 24 Marks)	- Each question carries 9 marks. - Two questions will be given from each module, out of which 1 question should be answered. - Each question can have a maximum of 3 sub divisions. (4 x 9 = 36 Marks)	60

Course Outcomes (COs)

At the end of the course students should be able to:

CO No.	Description	Blooms Knowledge Level (KL)
CO1	Apply algorithmic thinking and structured programming concepts to analyze problems and develop solutions using flowcharts, decision-making, and iterative constructs.	K3
CO2	Develop C programs using data types, operators, expressions, control structures, functions, and standard library functions to solve computational problems.	K4
CO3	Design and implement modular programs using arrays, pointers, structures, unions, recursion, and user-defined functions for efficient data manipulation.	K3
CO4	Develop file-processing applications and utilize Unix/Linux system interfaces, debugging techniques, macros, and user-defined libraries in software development.	K3
CO5	Develop and debug modular C applications in a Linux environment by integrating user-defined libraries, file handling mechanisms, and system-level interfaces to solve real-world computing problems.	K3

Note: K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyse, K5 – Evaluate, and K6 – Create

CO-PO Mapping Table:

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

Text Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	The C Programming Language	B. W. Kernighan and D. M. Ritchi	PHI	Second Edition (1988)
2	Programming in C	B. Gottfried	Schaum Outline Series	Second Edition (1996)

Reference Books

Sl. No.	Title of the Book	Name of the Author(s)	Name of the Publisher	Edition and Year
1	C: The Complete Reference	Herbert Schildt	McGraw Hill	Fourth Edition (2000)
2	Let Us C	Yashavant Kanetkar	BPB Publications	20th Edition (2024)

Video Links (NPTEL, SWAYAM, etc.)

Module No.	Link
1	https://onlinecourses.nptel.ac.in/e-learning/preview/noc22_cs40
2	https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs53
3	https://onlinecourses.nptel.ac.in/e-learning/preview/noc23_cs93

SEMESTER S1

BUSINESS COMMUNICATION & VALUE SCIENCE - I

Course Code	B26BCP105	CIE Marks	50
Teaching Hours/Week (L:T:P:R)	0:0:2:0	ESE Marks	-
Credits	1	Exam Hours	0
Prerequisites (if any)	Basic Knowledge of high school English	Course Type	Lab

Course Objectives:

1. Develop self-awareness, leadership qualities, and essential life skills required for personal growth, stress management, and effective teamwork.
2. Enhance communication competence through effective listening, speaking, reading, writing, grammar, vocabulary enrichment, and business communication practices.
3. Foster values, emotional intelligence, interpersonal skills, and professional communication abilities necessary for academic, personal, and workplace success.

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Module 1 Overview of Leadership Oriented Learning (LOL) Overview of Business Communication, Self-awareness – identity, body awareness, stress management.	8

2	Module 2 Essential Grammar-I: Refresher on Parts of Speech, Tenses: Applications of tenses in Functional Grammar, Sentence formation (general & Technical) , Common errors, Voices Communication Skills: Overview of Communication Skills, Barriers of communication, Effective communication, Types of communication – verbal and non-verbal, Role-play based learning, Importance of Questioning Listening Skills: Law of nature – Importance of listening skills, Difference between listening and hearing, Types of listening Personal Development, Expressing self, connecting with emotions, Visualizing and experiencing purpose	12
3	Module 3 Email Writing Formal and informal emails, Verbal Communication Pronunciation, Clarity of speech, Vocabulary Enrichment, Exposure to words from General Service List (GSL) by West, Academic Word List (AWL) Technical specific terms related to the field of technology, Phrases, Idioms, Significant abbreviations, Formal business vocabulary, Written Communication Summary writing, Story Writing, CV. Life Skills: Stress Management, Working with rhythm and balance, Colours and teamwork.	14
4	Module 4 Understanding Life Skills Introduction to life skills, Critical life skills, Multiple Intelligences, embracing diversity, Leadership, teamwork, dealing with ambiguity, Managing stress, motivating people, Creativity, Result orientation.	11

Laboratory

N o.	Activity	CO 'S
1	Introduce Yourself Creatively – Students introduce themselves using 5 strengths, 3 goals, and 1 unique fact.	1
2	Personal SWOT Analysis – Identify strengths, weaknesses, opportunities, and threats; present findings.	1
3	Values in Action – Discuss a role model and identify the values and life skills demonstrated.	1
4	Stress Busters Workshop – Practice breathing exercises, meditation, and stress-relief techniques followed by reflection.	1/4
5	Parts of Speech Hunt – Analyze a newspaper article and identify parts of speech in teams.	
6	Grammar Correction Challenge – Correct common grammatical and sentence-formation errors in given passages.	2
7	Role Play on Communication Barriers – Demonstrate poor communication and then improve it using effective communication strategies.	2
8	Questioning Skills Activity – Students interview peers and practice open-ended and probing questions.	2
9	Listening for Details – Listen to an audio clip and answer comprehension questions; discuss listening styles.	2
10	Formal vs Informal Email Writing – Draft both types of emails for given scenarios and peer-review them.	3
11	Group Discussion on Current Affairs – Students use newly learned vocabulary from newspapers or magazines.	3
12	Toastmasters Table Topics – Impromptu speeches on random topics followed by peer feedback.	3
13	One-Minute Story Writing – Write and present a short story based on a prompt using appropriate vocabulary and grammar.	3
14	Team Challenge: Tower Building – Groups build the tallest paper tower, followed by reflection on teamwork and leadership.	4
15	Movie Clip Analysis – Watch a short inspirational clip and identify life skills, values, leadership qualities, and decision-making aspects.	4
16	Elevator Pitch & Mock Interview Objective: Develop confidence, professional communication, and self-presentation skills.	5

**Course Assessment
Method (CIE: 50 marks)**

Continuous Internal Evaluation Marks (CIE):

Assignments/ Quiz/Micro Project/Presentation	Lab Evaluation	Total
25	25	50

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Understand the concepts of self-awareness, leadership-oriented learning, business communication, and stress management for personal development.	K2
CO2	Apply effective communication skills, including grammar, listening, speaking, and interpersonal communication techniques in various personal and professional contexts.	K3
CO3	Apply written and verbal communication skills to prepare emails, summaries, reports, CVs, and other professional documents using appropriate business and technical vocabulary.	K3
CO4	Apply life skills such as teamwork, leadership, emotional intelligence, creativity, stress management, and problem-solving to enhance personal effectiveness and workplace readiness.	K3
CO5	Apply professional communication, presentation, and interpersonal skills to enhance employability and workplace readiness.	K3

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create
CO-PO Mapping Table:

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

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books:

There are no prescribed texts for Semester 1 – there will be handouts and reference links shared.

Reference Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	English vocabulary in use	Alan Mc'Carthy and O'dell		
2	APAART: Speak Well 1 (English language and communication)			
3	APAART: Speak Well 2 (Soft Skills)			
4	Business Communication	Dr. Saroj Hiremath		

Online Resources	
Module No.	Link ID
1	https://www.coursera.org/learn/learning-how-to-learn
2	https://www.coursera.org/specializations/effective-business-communication

Evaluation for Lab Activity

Sl. No	Evaluation for	Allotted Marks
1	Performance Evaluation in Lab	15
2	Internal assessment	10
Total		25

Internal Examination Pattern:

The Internal examination shall be conducted for 50 marks, which will be converted to out of 10.

SEMESTER S1**ELECTRICAL AND ELECTRONICS WORKSHOP PRACTICE**

Course Code	G26EWP112	CIE Marks	50
Teaching Hours/Week (L: T:P: R)	0:0:2:0	ESE Marks	50
Credits	1	Exam Hours	NA
Prerequisites (if any)	None	Course Type	Lab

Course Objectives:

1. To create awareness and familiarity with electrical wiring and safety measures to be taken.
2. To Identify various electronic components and to operate various measuring instruments
3. Learn to setup simple electronic circuits on breadboard and PCB

SYLLABUS

Exp No	Experiments
Electrical Engineering Experiments	
1	a) Demonstrate the precautionary steps adopted in case of Electrical shocks. b) Identify different types of cables, wires, switches, fuses, fuse carriers, MCB, ELCB and MCCB, familiarize the ratings.
2	Wiring of a simple light circuit for light/ fan point (PVC conduit wiring) and a 6A plug socket with individual control.
3	Wiring of light/fan circuit using two-way switches. (Staircase wiring)
4	Wiring of fluorescent lamp and a power plug (16 A) socket with a control switch.

5	Wiring of power distribution arrangement using single phase MCB distribution board with ELCB, main switch and Energy meter.
6	Familiarization of step up and step-down transformers, (use low voltage transformers) Measurement and representation of voltage and waveform to scale in graph sheet with the help of CRO
7	Familiarization of rheostats, measurement of potential across resistance elements and introducing the concept of relative potential using a DC circuit.
8	a) Identify battery specifications using different types of batteries. (Lead acid, Li Ion, NiCd etc.) b) Familiarize different types of earthing (Pipe, Plate Earthing, Mat Schemes) and ground enhancing materials (GEM).
9	Resistance measurement using Voltmeter and Ammeter Method, using Multimeter.
10	Verification of Kirchhoff's Voltage and Kirchhoff's Current laws in simple DC circuits.
Electronics Engineering Experiments	
11	Familiarization/Identification of electronic components with specification (Functionality, type, size, colour coding, package, symbol and cost of -Active, Passive, Electrical, Electronic, Electro-mechanical, Wires, Cables, Connectors, Fuses, Switches, Relays, Crystals, Displays, Fasteners, Heat sink etc.)
12	Drawing of electronic circuit diagrams using BIS/IEEE symbols and Interpret data sheets of discrete components and IC's
13	Familiarization/Application of testing instruments and commonly used tools. - Multimeter, Function generator, Power supply, CRO, DSO. Soldering iron, Desoldering pump, Pliers, Cutters, Wire strippers, Screw drivers, Tweezers, Crimping tool, Hot air soldering and de- soldering station.
14	Testing of electronic components using multimeter - Resistor, Capacitor, Diode, Transistor and JFET.
15	Printed circuit boards (PCB) - Types, Single sided, Double sided, PTH, Processing methods. Design and fabrication of a single sided PCB for a simple circuit.
16	Inter-connection methods and soldering practice. Bread board, Wrapping, Crimping, Soldering - types - selection of materials and safety precautions. Soldering practice in connectors and general-purpose PCB, Crimping.

17	Assembling of electronic circuit/system on Bread Board , test and show the functioning (Any two)- Fixed voltage power supply with transformer · Rectifier diode · Capacitor filter · Zener/IC regulator Square wave generation using IC 555 timer in IC base.
18	Assembling of electronic circuits using SMT (Surface Mount Technology) stations.
19	Introduction to EDA tools (such as KiCad or Xcircuit)
20	Measurement of variables voltage, current, time period, frequency using CRO and DSO

Course Assessment Method

(CIA: 50 Marks, ESE: 50 Marks)

Continuous Internal Assessment (CIA):

Preparation/Pre-Lab Work, experiments, Viva and Timely completion of Lab Reports / Record (Continuous Assessment)	Total Marks
50	50

End Semester Examination (ESE):

Procedure/Preparatory work/Design/Algorithm	Conduct of Experiment/ Execution of work/troubleshooting/ Programming	Result with valid inference/ Quality of Output	Viva Voce	Record	Total Marks
10	20	5	10	5	50

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Identify and familiarize various electrical components.	K2

CO2	Identify and familiarize various electronic components.	K2
CO3	Illustrate the connection diagram and identify the suitable accessories necessary for wiring simple electric circuits.	K3
CO4	Apply the design procedure of simple electronic circuits on breadboard, PCB and Operate various measuring instruments to take measurements of circuit parameters.	K3
CO5	Design and interpret basic circuit diagrams and translate them into physical layouts for prototyping and testing	K3

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO 8	PO9	PO1 0	PO1 1
CO1	2	2									
CO2	2	2									
CO3	3	2									
CO4	3	2			2						
CO5	3	2			2	2		3	3	2	2

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Electrical Design Estimating and Costing	K B Raina and S K Bhattacharya	New Age International Publishers	2/e 2024

2	Electrical Systems Design	M K Giridharan	I K International Publishing House Pvt. Ltd	3/e 2022
3	Basic Electrical Engineering	D P Kothari and I J Nagrath	Tata McGraw Hill	4/e 2019
4	Basic Electronics and Linear Circuits	NN Bhargava, D C Kulshreshtha and S C Gupta	Mc Graw Hill	2/e 2017

SEMESTER S1

INDIAN KNOWLEDGE SYSTEM

Course Code	B26IKT108	CIE Marks	40
Teaching Hours/Week (L:T:P:R)	2:0:0:0	ESE Marks	60
Credits	2	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	NIL	Course Type	Theory

Course Objectives:

To provide an introduction to the development and evolution of Indian Knowledge Systems.

To develop an understanding of the thought processes that have shaped India's traditions and culture.

To highlight the significance of preserving and protecting traditional knowledge.

To familiarize learners with the scientific, philosophical, and cultural heritage of India.

To create awareness about the measures and mechanisms adopted for the protection of traditional knowledge.

To enable learners to apply the wisdom embedded in traditional knowledge to contemporary developmental activities.

SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Module 1 Indian Traditional Knowledge – An Introduction Definition of traditional knowledge – nature and characteristics – scope and importance – kinds of traditional knowledge – contexts	6

	in which traditional knowledge develops – historical impact of social change on traditional knowledge systems – Indigenous Knowledge (IK) and its characteristics – comparison between traditional knowledge and indigenous knowledge, western knowledge, and formal knowledge.	
2	Module 2 Protection and Legal Framework of Traditional Knowledge Protection of traditional knowledge – need and significance – value of traditional knowledge in the global economy – role of government in protection – The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 – Plant Varieties Protection and Farmers’ Rights Act, 2001 – Biological Diversity Act, 2002 – Protection of Traditional Knowledge Bill, 2016.	8
3	Module 3 Traditional Knowledge and Intellectual Property Rights Systems of traditional knowledge protection – legal concepts for the protection of traditional knowledge – non-IPR mechanisms of traditional knowledge protection – patents and traditional knowledge – strategies to increase protection of traditional knowledge – global legal fora for increasing protection of Indian traditional knowledge.	8
4	Module 4 Applications and Conservation of Traditional Knowledge Traditional knowledge in science and engineering – medicine and healthcare – agriculture – arts and humanities – importance of conservation and sustainable development – management of biodiversity – role of traditional knowledge in sustainable development and societal well-being.	10

**Course Assessment
Method (CIE: 40 marks,
ESE: 60 marks)**

Continuous Internal Evaluation Marks (CIE):

Assignment/ Quiz/Project	Internal Ex-1	Internal Ex-2	Internal Ex-3	Total
10	30	30	30	40
The total 90 marks, covert to 30				

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
2 Questions from each module. - Total of 8 Questions, each carrying 3 marks (8x3 =24 marks)	2 questions will be given from each module, out of which 1 question should be answered. - Each question can have a maximum of 2 subdivisions. Each question carries 9 marks. (4x9 = 36 marks)	60

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Explain the nature, characteristics, and significance of traditional knowledge systems.	K2
CO2	Describe the legal provisions and policies related to the protection of traditional knowledge.	K2
CO3	Analyze the role of intellectual property rights in preserving and promoting traditional knowledge.	K4
CO4	Examine the applications of traditional knowledge in various domains and their relevance to contemporary society.	K4
CO5	valuate the contribution of traditional knowledge towards sustainable development and biodiversity conservation.	K5

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

CO-PO Mapping Table:

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

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Introduction to Indian Knowledge System: Concepts and Applications	B. Mahadevan, Vinayak Rajat Bhat, and Nagendra Pavana R. N.	PHI Learnin g Pvt. Ltd., New Delhi	First Editio n, 2022
2	Indian Knowledge Systems	R. Balasubramanian	DK Printwo rld (P) Ltd., New Delhi	First Editio n, 2020

Reference Books

Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<i>Indian Knowledge Systems: Knowledge Traditions and Practices of India</i>	Kapil Kapoor and Avadhesh Kumar Singh (Eds.)	Indian Institute of Advanced Study (IIAS), Shimla	First Edition, 2005
<i>Indian Knowledge Systems: Concepts and Applications</i>	S. Narain (Ed.)	Centre for Studies in Civilizations, New Delhi	First Edition, 2021
<i>Dharmic Traditions and Indian Knowledge Systems</i>	B. Mahadevan	Bloomsbury India, New Delhi	First Edition, 2023
<i>Indian Philosophy</i>	S. Radhakrishnan	Oxford University Press, New Delhi	Second Edition (Reprint), 2008

Online Video Resources

Title / Resource	Platform / Provider
<i>Indian Knowledge System: Concepts and Applications in Engineering</i>	https://onlinecourses.swayam2.ac.in/imb26_mg12/preview
<i>Introduction to Indian Knowledge System</i>	https://nptel.ac.in/courses/101104065
<i>Indian Knowledge System: Humanities and Social Sciences</i>	https://onlinecourses.swayam2.ac.in/nou25_ge95/preview
<i>Introduction to Ancient Indian Technology</i>	https://onlinecourses.swayam2.ac.in/imb25_mg18/preview
<i>Lectures and Videos on Indian Knowledge Systems</i>	https://iksindia.org/

