Annexure – I

CREDIT FRAMEWORK STRUCTURE

Semester		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	7	7							**14**
Engineering Science Course		6	6							**12**
Program Core Course (PCC)	Program Courses	2	2	13	10	7	4	6		**44**
Program Elective Course (PEC)						4	6	6	4	**20**
Multidisciplinary Minor (MDM)	Multidisciplinary Courses			2	3	3	3	3		**14**
Open Elective (OE) Other than a particular program						2	3	3		**08**
Vocational and Skill Enhancement Course (VSEC)	Skill Courses		2	1	1	2	2			**08**
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	1	1			2				**04**
Entrepreneurship/Economics/Management Courses				2	2					**04**
Indian Knowledge System (IKS)		2								**02**
Value Education Course (VEC)				2	2					**04**
Research Methodology	Experiential Learning Courses								4	**04**
Comm. Engg. Project (CEP)/ Field Project (FP)					2					**02**
Project							2	2		**04**
Internship/OJT									12	**12**
Co-curricular Courses (CC)	Liberal Learning Courses	2	2							**04**
Total Credits (Major)		**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**160**

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B. Tech. Scheme of Examination & Syllabus 2025-26

Computer Science and Engineering (DATA SCIENCE)

GROUP I : SEMESTER I

Sr No	Course Category	CourseCode	Course Title	Hours per Week			Credits	Maximum Marks				Minimum Passing Marks	Duration of ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1.	BSC	25DS101T	Engineering Chemistry	2	-	-	2	10	10	30	50	23	1.5
2.	BSC	25DS101P	Engineering Chemistry Lab	-	-	2	1	-	25	25	50	25	-
3.	BSC	25DS102T	Linear Algebra and Calculus	3	-	-	3	20	20	60	100	45	3
4.	BSC	25DS102P	Linear Algebra and Calculus Lab	-	-	2	1	-	25	25	50	25	
5.	ESC	25DS103T	Logic building using C	2	-	-	2	10	10	30	50	23	1.5
6.	ESC	25DS103P	Logic building using C Lab	-	-	2	1	-	25	25	50	25	-
7.	ESC	25DS104T	Digital Electronics	2	-	-	2	10	10	30	50	23	1.5
8.	ESC	25DS104P	Digital Electronics Lab	-	-	2	1	-	25	25	50	25	-
9.	PCC	25DS105P	Data Science workshop – I	-	-	4	2	-	25	25	50	25	-
10.	AEC	25DS106P	Business Communication Skills I Lab	-	-	2	1	-	25	25	50	25	-
11.	IKS	25DS107T	Indian Knowledge Systems	2	-	-	2	10	10	30	50	23	1.5
12.	CC	25DS108T	Co-curricular Courses - I	2			2	-	50	-	50	25	-
Total				**13**	**0**	**14**	**20**	**60**	**260**	**330**	**650**	**312**	

Chairman - BoS	Dean – Academics	July 2025	3.0	Applicable for 2025-26
		Date of Release	Version	

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Computer Science and Engineering (DATA SCIENCE)

GROUP I : SEMESTER II

Sr No	Course Category	CourseCode	Course Title	Hours per Week			Credits	Maximum Marks				Minimum Passing Marks	Duration of ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1.	BSC	**25DS201T**	Engineering Physics and Materials Science	2	-	-	2	10	10	30	50	23	1.5
2.	BSC	**25DS201P**	Engineering Physics and Materials Science Lab	-	-	2	1	-	25	25	50	25	-
3.	BSC	**25DS202T**	Statistics and Probability	3	-	-	3	20	20	60	100	45	3
4.	BSC	**25DS202P**	Statistics and Probability Lab	-	-	2	1	-	25	25	50	25	-
5.	ESC	**25DS203T**	Data Structures	3	-	-	3	20	20	60	100	45	3
6.	ESC	**25DS203P**	Data Structures Lab	-	-	2	1		25	25	50	25	-
7.	ESC	**25DS204T**	Introduction to Data Science	2	-	-	2	10	10	30	50	23	1.5
8.	PCC	**25DS205P**	Data Science workshop – II	-		4	2	-	25	25	50	25	-
9.	AEC	**25DS206P**	Business Communication Skills – II Lab	-	-	2	1	-	25	25	50	25	-
10.	SEC	**25DS207T**	Design Thinking	2	-	-	2	10	10	30	50	23	1.5
11.	CC	**25DS208T**	Co-curricular Courses – II	2	-	-	2	-	50	-	50	25	-
Total				**14**	**0**	**12**	**20**	**70**	**245**	**335**	**650**	**308**	

Chairman - BoS	Dean – Academics	July 2025	3.0	Applicable for 2025-26
		Date of Release	Version	

SEMESTER I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25DS101T	Engineering Chemistry	2	0		2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended 1. To acquaint the students with the basic phenomenon, concepts, knowledge and understanding of the fundamental principles of chemistry. 2. To develop necessary skills and abilities to succeed in engineering education, research, Industry, environment and social context.	**Students will be able to** 1. Develop innovative ideas for use of advanced materials in sustainable development. 2. Evaluate the role of nanotechnology in industrial applications such as energy storage, medicine, electronics, and environmental remediation. 3. Apply the Basic concepts of Electrochemistry in engineering 4. Evaluate the performance and advantages of Li-Ion battery, fuel cell and photochemical cell in terms of efficiency, working mechanism, and applications. 5. Apply the concept of e-waste management and analyze its environmental impact

Unit I Advanced Material **[10 Hrs]**

Introduction-Need for Development, Biodegradable polymers- PLA, PCL - Synthesis, Properties and Applications, Conducting Polymers- Polypyrole, PANI Synthesis, Properties and Applications, Liquid Crystal Polymers- Types, Properties and Applications, Composite Material- Constituents- Matrix & Reinforcement, Classification of composite, Advantages & Industrial Applications of Composite materials, Nanomaterials- Definition, Carbon Nanotubes, Industrial Applications of Nanotechnology

Unit II Electrochemical Phenomenon & Battery Technology **[10 Hrs]**

Introduction- brief idea about Electrochemical & Galvanic series, Electrolytic & Electrochemical Cell,
Battery- Primary, Secondary & Reserve batteries- Advantages & Applications,
Li Ion Battery, H_2O_2 Fuel Cell, Photochemical Cell - Construction, Working, Advantages & Applications. Electrolysis of water to produce hydrogen

Unit III Chemistry of Electronic waste **[10 Hrs]**

Introduction. E- Waste; composition and generation. Types of E-waste, E waste hazardous properties, Effects of pollutant (E-waste) on human health and surrounding environment, Basic principles of E waste management, Component of E waste management- Domestic e-waste disposal, E-waste Control measures- Reduction of waste at source, Segregation & Recycling- Hydrometallurgical, Pyro metallurgical & Direct recycling.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Text Book of Engineering Chemistry	S.S. Dara,	New	S. Chand and Company Ltd. New Delhi.
2	Textbook of Engineering Chemistry	P.C. Jain and Monica Jain	Sixth	Dhanpat Rai and Sons, New Delhi.
3	E-waste Recycling and Management	Anish Khan, Inamuddin, Abdullah M. Ansiri	Ist	Springer

Reference Books

S.N	Title	Authors	Edition	Publisher
1	A Text book of Engineering Chemistry	Shashi Chawla	Ist	DhanpatRai& Sons, New Delhi
2	Applied Chemistry	N. Krishnamurthy:P. Vallinavagam. And K. Jeysubramanian	Ist	TMH

Online Resources

1	suchitanimbalkar@gnomio.com
2	kkhandarka@gnomio.com
3	mmjstudents@wordpress.com
4	jyotithakre@gnomio.com

SEMESTER I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25DS101P	Engineering Chemistry Lab			1	1	25	25	50

Course Objectives	Course Outcomes
1. To Make the students aware about various techniques available for Analysis of Material. 2. To Impart the skill of handling chemicals and apparatus.	1. Prepare chemical compounds, materials, and standard solutions using conventional laboratory techniques and demonstrate good laboratory practices. 2. Utilize electrochemical and conductometric methods for the quantitative estimation of chemical substances such as acids and metals. 3. Analyze industrial effluents to determine the concentration of pollutants using quantitative chemical analysis methods 4. Interpret water quality parameters and estimate metal concentrations through virtual simulations and demonstration-based experiments.

Expt. No.	Experiments based on Performance (Any SIX)
1	Synthesis of Bakelite resin using acid catalyst.
2	Synthesis of Conducting polymer (Polyaniline).
3	Determination of heavy metal from industrial effluent by complexometry method.
4	Determination of heavy metal from industrial effluent by colorimeter
5	Preparation of Natural fibre reinforcement Composite material
6	Determination of strength of the given acid Conductometrically
7	Determine electrochemical equivalent of Cu metal using Faradays law
8	Preparation of different solutions (Molar, Normal & Percent solution)
	Virtual Experiment - Any ONE
9	Determination of Hardness from Tap water/ Well water/ Sea water
10	Determination of Alkalinity of Water Sample using Warder method
11	Electro gravimetric estimation of Nickel metal
	Demonstration - Any ONE
12	Determination of turbidity from industrial effluent.
13	Determination of pH by using different methods.
	Activity - Any ONE
1	Visit to e-waste recycling plant
2	Study of Air /Water Pollution Level at different Sites in Nagpur City.
3	Study of nearby industrial chemicals and safety measures

Text Books

S.N	Title	Authors	Edition	Publisher
1	A Textbook on experiment and calculation in engineering chemistry	S.S. Dara	9th	S.Chand

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Applied Chemistry theory and practical	O.P. Virmani and A.K. Narular	Ist	New Age International
2	Laboratory Manual on Engineering Chemistry	Dr. Subdharani	Ist	Dhanpat Rai Publishing

SEMESTER-I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25DS102T	Linear Algebra & Calculus	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
This course is intended to 1. Develop students' conceptual understanding and computational skills in Matrix Algebra and Differential Equations for solving mathematical problems. 2. Enable learners to apply Multivariate and Vector Calculus for analyzing functions of several variables and modeling physical phenomena.	**Students will be able to** Students will be able to 1. Apply matrix concepts to solve and analyze linear systems. 2. Analyze and solve engineering problems involving eigenvalues, eigenvectors, and functions of matrices. 3. Solve multivariate calculus problems involving partial derivatives, Jacobians, and optimization. 4. Apply first order and higher order differential equations to solve problems in engineering. 5. Evaluate vector calculus operations and their physical applications.
Unit I	**[9Hrs]**
Matrix Algebra : Introduction to matrices, , Rank of a matrix, Consistency of system of linear equations, Linear and orthogonal transformations, Linear dependence of vectors.	
Unit II	**[9Hrs]**
Matrices: Characteristics equation, Cayley- Hamilton Theorem**,** Eigen values and Eigen vectors, Reduction to diagonal form, Reduction of quadratic form to canonical form by orthogonal transformation, Sylvester's theorem.	
Unit III	**[9Hrs]**
Multivariate Calculus: Functions of several variables and their partial derivatives, Chain rule and total differential coefficient, Jacobians and its properties, Maxima –Minima of functions of two variables, Lagrange's method of undetermined multipliers.	
Unit IV	**[9Hrs]**
Differential Equations: First order and first degree differential equations: Linear, Higher order differential equations with constant coefficients, Method of variation of parameters, Cauchy's homogeneous linear equation, Applications of differential equations.	
Unit V	**[9Hrs]**
Vector Calculus: Vector differentiation, Gradient, Directional derivatives, Divergence and Curl with their physical interpretation Solenoidal and Irrotational motions, Scalar potential, Line integral & Work done.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Higher Engineering Mathematics	B. S. Grewal	38th	Khanna Publishers, New Delhi.
2	Higher Engineering Mathematics	H. K. Das & Er. Rajnish Verma	1st	S. Chand & CO. Pvt. Ltd., New Delhi

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Higher Engineering Mathematics	B.V. Ramana,	11th reprint, 2010.	Tata McGraw Hill New Delhi
2	A Text Book of Engineering Mathematics	Peter O' Neil	8th	Thomson Asia Pvt. Ltd., Singapore.

SEMESTER-I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25DS102P	Linear Algebra & Calculus Lab	--	--	2	1	25	25	50

Course Objectives	Course Outcomes
This Course is intended to: 1. To develop students' computational proficiency in solving problems related to linear algebra, calculus, and differential equations using SageMath with an emphasis on symbolic computation and numerical methods. 2. To enable students to apply SageMath for solving and visualizing problems in vector calculus through effective use of graphical and analytical tools.	**Students will be able to:** 1. Apply fundamental matrix operations and solve systems of linear equations using SageMath. 2. Apply concepts of linear algebra to compute eigenvalues and eigenvectors of matrices using SageMath. 3. Evaluate partial derivatives of multivariable functions and solve first and higher-order ordinary differential equations using SageMath. 4. Analyze and visualize vector calculus operations including gradient, divergence, curl, and evaluate line and surface integrals using SageMath.

List of Experiments:-

Experiment No.	List of Experiment
1	To Implement basic matrix operations using SageMath's symbolic computation tools.
2	To check the consistency of a system of linear equations using augmented matrices and SageMath.
3	To solve systems of linear equations using various within the SageMath environment.
4	To determine eigenvalues and eigenvectors of matrices using built-in SageMath functions.
5	To implement and validate the Cayley-Hamilton Theorem with the aid of SageMath.
6	To compute partial derivatives of various orders for multivariable functions using SageMath.
7	To solve first-order and higher-order differential using SageMath's differential equation solvers.
8	To find maxima and minima of functions of two variables using partial derivatives and the second derivative test implemented in SageMath.
9	To compute and visualize vector differential operations using SageMath.
10	To compute vector integrals in SageMath.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Computational Mathematics with SageMath	Paul Zimmermann	1st	SIAM Publications Library.
2	Basics of SageMath : Mathematics(Practicals)	Varun Kumar	1st	Amazon KDP

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mathematics-SageMath Software System	Indrajeet Varhadpande & Dr. Kirti Sahu	1st	Himalaya Publication

2	Applied Mathematics Using SageMath	Dr. Kirti Sahu & Dr. Sajid Anwar	1st	Himalaya Publication

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						CA	MSE	ESE	Total
25DS103T	Logic Building With C	2			2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended ● To make the student learn a programming language. ● To learn problem solving techniques. ● To teach the student to write programs in C and to solve the problems	**Students will be able to** ● Construct flowcharts to visually represent algorithms for problem-solving and develop step-by-step algorithms. ● Apply the fundamental concepts of C programming including variables, data types, and operators. ● Develop logical thinking through the use of control structures such as conditional and looping statements. ● Implement array and string operations to solve computational problems.

Unit I **[10 Hrs]**

Introduction to Programming & Logic Building-Programming language, Problem Solving technique **Algorithms and Flowcharts:** Characteristics, Advantages and Disadvantages of algorithms, Characteristics of flowcharts, flowchart symbols, Advantages and Disadvantages of flowcharts. **Introduction to C Language:** Structure of a C program C Character Set, Identifiers, Keywords, Data Types, Constants, Variables, Declarations, Expressions, Statements, and Symbolic Constants.

Unit II **[10 Hrs]**

Operators and Expressions: Arithmetic Operators, Unary Operators, Relational and Logical Operators, Decision Control Statement-if, if-else, Nested if-else statement, Switch case, Loops and Writing and evaluation of conditionals and consequent branching. **Introduction to Array** : Need for arrays, Definition and syntax of 1D arrays, Memory layout and indexing, Initialization methods, **1D Array Operations:** Traversal (printing elements), Input and output using loops, **2D Array**: Declaration and initialization.

Unit III **[10 Hrs]**

Introduction to strings: Basic string operations (strlen, strcpy, etc.) **Functions:** User defined and Library Functions, Parameter passing in functions, call by value, Passing arrays to functions: call by reference, Recursion Introduction to Structures and Pointers.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Programming in ANSI C	E. Balguruswamy	1	Tata Mc-Graw Hill
2	Programming Techniques Through 'C'	M. G. Venkateshmurthy	1	Pearson
3	Let Us 'C'	Yashwant P. Kanetkar	1	BPB

Reference Books

S.N	Title	Authors	Edition	Publisher
1	The Complete Reference C	Herbert Schildt	4	Tata Mc-Graw Hill
2	The 'C' programming language	Kernighan and Ritchie	1st	Prentice Hall

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25DS103P	Logic Building With C Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended ● To understand the fundamentals of C programming ● To learn problem solving techniques. ● To teach the student different data structures to write programs in C	**Students will be able to** ● Understand the fundamentals of c programming ● Choose the loops and decision making for the given problem. ● Implement different operations on arrays ● Design functions to solve the given problem Implement pointers, structures

Expt. No.	Title of the experiment
1	Write a program to demonstrate use of variables, constants, and data types.
2	Write a program to find the largest of three numbers.
3	Write a program to calculate factorial of a number using for loop.
4	Write a program to create patterns using conditional branches.
5	Create a calculator using switch case statement.
6	Write a program to swap values using call by value and reference.
7	Write a program to use the function for factorial of a number.
8	Write a program to show information of a student using structure.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Programming With C	Byron S. Gottfried	2nd	Schaum Series
2	How to solve it by Computer	R.G. Dromey	1st	Pearson Education

Reference Books

S. N	Title	Authors	Edition	Publisher
1	Programming and Problem Solving	M. Sprankle	2nd	Pearson Education

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						CA	MSE	ESE	Total
25DS104T	Digital Electronics	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended • To acquire the basic knowledge of digital logic levels • Application of knowledge to understand digital electronics circuits. • To impart how to design Digital Circuits.	**Students will be able to** • represent numerical values in various number systems • Analyze and design the knowledge of: logic gates, Boolean algebra, Karnaugh map. • Analyze and design digital combinational circuits , sequential digital circuits.

Unit I	**[7Hrs]**
Number systems & codes: Binary Number base conversion, Octal & hexadecimal numbers, complements, signed binary numbers, binary codes-BCD codes, gray codes, ASCII Character Code, Codes	
Unit II	**[7Hrs]**
Introduction to Boolean Algebra , Basic Logic gates: Canonical & standard form, Karnaugh Maps (K-Maps), Combinational Logic: Combinational Circuits; Introduction to Binary Adder-subtractor, Multiplexers and demultiplexers	
Unit III	**[7Hrs]**
Decoders, Encoders, Sequential Circuits Sequential Logic Circuits: RS, Clocked RS, D, JK, Master Slave JK, T Flip-Flops and conversion of Flip-Flops	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Digital Design	M. Morris Mano, Michael D. Ciletti	5th Edition	Pearson Education
2.	Digital Electronics: Principles, Devices and Applications	Anil K. Maini	2	John Wiley & Sons, Ltd

Reference Books

S. N	Title	Authors	Edition	Publisher
1.	Digital Fundamentals –A Systems Approach	Thomas L. Floyd	1	Pearson
2.	Fundamentals of Logic Design	Charles H. Roth	5	Cengage Learning

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25DS104P	Digital Electronics Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended ● To introduce the basic concepts and laws involved in the Boolean algebra and logic families and digital circuits. ● To familiarize with the different logic gates, and combinational and sequential circuits utilized in the different digital circuits and systems.	**Students will be able to** ● Implement the Combinational Circuits using Logic Gates. ● Design Arithmetic and Logical Circuits. ● Demonstrate understanding of flip-flops & Sequential circuits

Expt. No.	Title of the experiment
1	To verify the truth table of different logic gates.
2	Implement and verify the NAND & NOR gates as universal gates.
3	Construct and verify the truth tables for Half Adder and Full Adder circuits.
4	Examine and validate the truth tables for Multiplexers and Demultiplexers.
5	Assess and verify the truth tables for different types of flip-flops.
6	Design and implement a 4-bit ripple counter and validate its functionality.
7	Write and execute an Assembly Language Program (ALP) for the addition and subtraction of two 16-bit numbers.
8	Develop a mini-project that integrates the above concepts.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Digital Integrated Electronics	Herbert Taub	1	McGraw Hill.
2	Digital Logic and Computer Design	Morris Mano	2	PHI

Reference Books

S. N	Title	Authors	Edition	Publisher
1.	Digital Electronics Logic and System	James Bingnell, Robert Donovan	1	McGraw Hill.

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25DS105P	Data Science Workshop - I			4	2	25	25	50

Course Objectives	Course Outcomes
This course is intended • Perform Basic of Excel. • Implement Basics and advance functions for calculation. • Demonstrate how to organize raw data using Excel. • Design and implement Statistical Analysis using Excel. • Develop Advanced Excel for descriptive and predictive analysis.	**Students will be able to** • Learn a foundational understanding of Excel, including data entry, formatting, and navigation. • Able to perform basic arithmetic operations and use fundamental Excel functions • Learn to organize raw data by sorting, filtering, and using Excel's data validation tools.. • Students will be able to visualize data using charts, graphs.

Expt . No.	Title of the experiment
1	Introduction to MS Excel files, Workbooks, Worksheets, Columns and Rows.
2	To Implement different functions in Excel.
3	To perform data analysis using Pie Charts, Bar Chart, Column Chart, Line and Column Chart.
4	Using what if Analysis Tools i)Goal seek ii)Scenario Manager iii)Data table
5	To perform Data Validation on number, Date, Time, Text and list
6	To create and format a pivot table in MS Excel.
7	To search for a value in one column or row based on a given value in another column using vlookup and Hlookup in Excel.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Microsoft Excel 2019 Bible	Michael Alexander, Richard Kusleika, and John Walkenbach	1st Edition	Wiley
2	Excel 2019: The Missing Manual	Matthew MacDonald	1st Edition	O'Reilly Media

Reference Books

S. N	Title	Authors	Edition	Publisher
1.	Excel 2019 All-in-One For Dummies	Alexander Dmitrienko and David L. Poole	1st Edition	imprint of John Wiley & Sons
2.	Statistical Analysis: Microsoft Excel 2016	Peter Bruce and Andrew Bruce	5th Edition	Que Publishing

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25DS106P	Business Communication Skills I Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To empower students to develop a career-oriented mindset while harnessing the power of LSRW skills.	**Students will be able to:** 1. apply verbal and non-verbal skills to confidently and effectively deliver presentations. 2. prepare themselves for overall language ability through listening and reading tasks. 3. demonstrate formal writing skills. 4. draft impactful Resumes and Cover Letters. 5. prepare themselves for Personal Interviews.

Expt. No.	Title of the experiment
1	Presentation Skills
2	Poster Making (Product/ Event)
3	Reading Comprehension for Competitive Exams.
4	Writing Skills for Academic Purposes.
5	Listening Skills I
6	Business Correspondence I
7	Resume Writing and Cover Letter
8	Mock Interviews

Reference Books:

S. N	Title	Authors	Edition	Publisher
1	Communication Skills for Engineers	C. Muralikrishna & SunitaMIshra	2nd Edition, 2011	Pearson India Education Services
2	Communication Skills	Dr. L .Bisen, Dr. B. Agrawal & Dr. N. T. Kalyani	1st Edition, 2021	Himalaya Publishing House
3	Barron's IELTS Superpack	Lin Lougheed	2012	Barrons Educational Series

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COMPUTER SCIENCE ENGINEERING (DATA SCIENCE)

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25DS107T	INDIAN KNOWLEDGE SYSTEM	2		-	2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended to • To understand the distinctive features of Indian Knowledge Traditions. • To explore India's contributions in science, mathematics, astronomy, technology, and architecture. • To connect IKS concepts with modern applications and sustainable practices.	**Students will be able to** • Comprehend the foundations of Indian Knowledge System and its difference from Western approaches. • Analyze India's contributions in mathematics, astronomy, and technology. • Appreciate the relevance of art, architecture, and traditional sciences in modern contexts.

Unit I FOUNDATIONS OF IKS	**[8Hrs]**
Introduction to the Indian Knowledge System with its distinctive features in contrast to Western thought, the Vedic corpus including the Vedas, Upaniṣads, and associated philosophical traditions, knowledge traditions of Śikṣā dealing with phonetics, Vyākaraṇa focusing on grammar, Nirukta exploring etymology, Chandas emphasizing prosody, Kalpa codifying rituals and social duties, Jyotiṣa concerning astronomy and timekeeping, and reflective Discover IKS activities based on case studies and experiential learning.	
Unit II SCIENTIFIC AND TECHNOLOGICAL CONTRIBUTIONS	**[8Hrs]**
Mathematics including the number system, importance of zero, contributions of Brahmagupta, developments in geometry and algebra, ancient Indian astronomy and its observations, contributions of Parāśara and Garga, connections between astronomical knowledge and Vedic rituals, engineering and technology in ancient India covering metallurgy and advanced metalworking, healthcare practices and their scientific basis, construction of granite structures and architectural precision, Harappan technology and innovations in urban planning, maritime traditions and shipbuilding heritage, case studies on the works of Indian mathematicians, the astronomical observatory of Jantar Mantar, and the corrosion-resistant Iron Pillar of Delhi.	
Unit III Art, Architecture & Sustainable Knowledge	**[8Hrs]**
Town planning traditions from the Harappan civilization to classical India, rock-cut architecture including the Ellora caves, Kailasanātha temple, and Buddhist cave traditions, principles of temple design and Vastu Shastra, indigenous engineering in art and architecture blending aesthetics, science, and spirituality, relevance of IKS in contemporary contexts through sustainability, holistic living, and eco-conscious design.	

Text Books

Sr. No.	Title	Authors	Edition	Publisher
1	Indian Knowledge System	Kapil Kapoor & Michel Danino(Eds.)	1st	PHI Learning
2	Foundations of Indian Culture and Knowledge System	B. L. Atreya	Reprint	Bharatiya Vidya Bhavan
3	Essays on Indian Knowledge Systems	Michael Danino	1st	AICTE – IKS Division

Reference Books

Sr. No.	Title	Authors	Edition	Publisher
1	Indian Knowledge Systems: Nature, Philosophy and Manifestation	Bal Ram Singh, Pushpesh Pant	1st	Pratibha Prakashan
2	The Science and Technology in Ancient India	Debiprasad Chattopadhyaya	Reprint	People's Publishing House

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