ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

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

Department of Artificial Intelligence

GROUP I: SEMESTER I

Sr.	Course Category	CourseCode	Course Title	Hours per Week			Credits	Maximum Marks			Total	Minimum Passing Marks	Duration
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination			No. of Hrs for ESE
1	BSC	25AI101T	Engineering Chemistry	2	-	-	2	10	10	30	50	23	1.5
2	BSC	25AI101P	Engineering Chemistry Lab	-	-	2	1	-	25	25	50	25	-
3	BSC	25AI102T	Linear Algebra and Calculus	3	-	-	3	20	20	60	100	45	3
4	BSC	25AI102P	Linear Algebra and Calculus Lab	-	-	2	1	-	25	25	50	25	-
5	ESC	25AI103T	Logic building & Problem-Solving with C	3	-	-	3	20	20	60	100	45	3
6	ESC	25AI103P	Logic building & Problem-Solving with C Lab	-	-	2	1	-	25	25	50	25	-
7	ESC	25AI104T	Digital Electronics	2	-	-	2	10	10	30	50	23	1.5
8	PCC	25AI105T	Fundamentals of AI	2	-	-	2	10	10	30	50	23	1.5
9	AEC	25AI106P	Business Communication Skills- I Lab	-	-	2	1	-	25	25	50	25	-
10	IKS	25AI107T	Indian Knowledge Systems[#]	2	-	-	2	10	10	30	50	23	1.5
11	CC	25AI108T	Co-curricular Courses - I	2	-	-	2	-	50	-	50	23	-
Total				16	0	8	20	80	230	340	650		

 # Course to be conducted online through NPTEL.

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

SEMESTER I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25AI101T	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

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SEMESTER I

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25AI101P	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
25AI102T	Linear Algebra and Calculus	3		1	4	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
25AI102P	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

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Department of Artificial Intelligence

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25AI103T	Logic building & Problem-Solving with C	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To introduce foundational programming concepts, including C language syntax, compilation-execution workflow, and basic constructs such as variables, data operators, decision-making, and iteration. 2. To develop proficiency in modular programming, covering functions, pointers. recursion, pointers, arrays, strings, and dynamic memory allocation for effective problem-solving. 3. To equip with advanced data handling skills, using structures, unions, and managing file operations to manage and manipulate complex data in C programming.	**Students will be able to** • Learn the fundamentals of C programming, including types, and basic input/output operations. • Apply operators, control flow statements, and loops to solve problems. • Demonstrate proficiency in using functions, recursion, and • Implement array and string manipulation techniques along with dynamic memory management. • Analyze the role of structures, unions, and file handling in complex data.

Unit I: Problem Solving and C Language Basics **(9 Hours)**

Introduction to Programming Languages: Machine, Assembly, High-level Languages, Compilers, Interpreters, and Assemblers. **Overview of C Language:** History and applications of C, Structure of a C program, Compilation and execution process in detail, Debugging techniques and IDE usage.,**C Basics:** Keywords, Identifiers, Constants, Variables and Data Types, Input and Output statements using scanf() and printf() with format specifiers.

Unit II: Operators, Control Flow and Iteration **(9 Hours)**

Operators in C: Arithmetic, Relational, Logical, Assignment, Bitwise, Conditional, Type conversion, Operator precedence and associativity. **Decision-Making Statements:** if, if-else, else-if, nested if, switch-case, Practical scenarios for conditional logic. **Looping Constructs:** for, while, do-while loops with dry run examples, Nested loops and use-cases, Loop control (break, continue, goto).Debugging looping and decision constructs.

Unit III: Functions, Recursion and Pointers **(9 Hours)**

Functions: Types (User-defined and Library Functions), Function declaration, definition, and calling, Function return types and parameters, Call by value vs Call by reference, Recursion with examples (factorial, Fibonacci).**Storage Classes:** auto, static, extern, register. **Pointers:** Pointer declaration and initialization, Accessing variables using pointers, Pointer arithmetic, Pointers to pointers and void pointers, Passing pointers to functions.

Unit IV: Arrays, Strings, and Dynamic Memory **(9 Hours)**

Arrays: One-dimensional and two-dimensional arrays, Array memory representation, Array operations and passing arrays to functions. **Strings:** Declaration and initialization of strings, String I/O (gets(), puts(), best practices), String manipulation with and without library functions (strlen, strcmp, strcpy, strcat, strrev).**Dynamic Memory Allocation**: malloc, calloc

Unit V: Structures, Unions, and File Handling **(9 Hours)**

Structures and Unions: Definition, declaration, initialization, Accessing members, Nested structures, Arrays of structures, Difference between structures and unions. **File Handling in C**: File operations (fopen, fclose, fprintf, fscanf, fread, fwrite), File modes and error handling, Reading and writing structured data, Copying content from one file to another, Working with command-line arguments.

Text Books

S.N	Title	Authors	Edition	Publisher
1	The C Programming Language	Brian W. Kernighan, Dennis M. Ritchie	2nd Edition	Prentice Hall
2	Programming in ANSI C	E. Balagurusamy	8th Edition	McGraw Hill
3	Let Us C	Yashavant Kanetkar	16th Edition	BPB Publications

Reference Books

S.N	Title	Authors	Edition	Publisher
1	C Programming: A Modern Approach	K. N. King	2nd Edition	W. W. Norton & Company
2	Data Structures Using C	Reema Thareja	2nd Edition	Oxford University Press
3	Mastering Algorithms with C	Kyle Loudon	1st Edition	O'Reilly Media

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25AI103P	Logic Building and Problem-Solving Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
This course is intended to 1. Make the student learn a programming language. 2. Learn problem solving techniques. 3. Teach the student to write programs in C and to solve the problems	**Students will be able to** • Demonstrate Fundamentals of Computers and C programming language • Implement basic programs of decision making and loop control. • Apply fundaments of arrays and structures • Implement programs using functions and pointers. • Implement concept of string and various operations on files.

Sr. No.	List of Practical
1.	A teacher wants to calculate the average score of three exams taken by a student to assess their overall performance. This program can be used to automate the process of calculating both the sum of the scores and the average.
2.	A bank wants to calculate the simple interest on a loan given to a customer. By inputting the principal amount, interest rate, and the time period, this program can compute how much interest the customer owes over the specified period
3.	A delivery service uses a program to determine the shipping cost based on different conditions like weight, location, and delivery speed. The program uses conditional statements (like if, else, and switch) to calculate the appropriate cost based on these factors.
4.	A store wants to calculate the total price of items in a shopping cart. The program iterates through each item in the cart, using loops to sum the total cost and apply any applicable discounts or promotions.
5.	A sports team needs to track the scores of players in a game. Each player's score is stored in an array, and the program can calculate the total team score, find the highest and lowest scores, or even sort the array to determine player rankings.
6.	A hospital uses a two-dimensional array to track the availability of beds across different wards. Each element in the array represents the occupancy status (occupied or vacant) for a particular room in a specific ward. This can also be used for matrix operations like calculating patient distribution across various wards.
7.	A chatbot application that interacts with customers' needs to process user input in the form of strings. The program uses predefined string functions to perform operations such as searching for keywords, transforming the case, or comparing responses to frequently asked questions.
8.	A software company is developing a payroll system. Different functions are created to calculate salaries, apply taxes, or generate reports. Each function takes specific arguments (like hours worked, rate of pay) and returns results (total pay, tax amount, etc.).
9.	A medical research laboratory is developing a simulation program where complex data structures (like patient records or experimental data) are passed between different parts of the program. Pointers help optimize memory usage and speed, especially when handling large datasets.
10.	A university uses structures to store information about students. Each student has a name, ID number, date of birth, and grade. By using structures, the program can manage this information in an organized way, making it easier to access and update.
11.	"To explore how files function in real life: understanding their creation, how we open and close them, and how we read from and write to them.
Beyond Syllabus	
12	Create a file-based data logger for energy consumption tracking

Text Books

S.N	Title	Authors	Edition	Publisher
1	Programming in ANSI C	E. Balagurusamy	8th Edition	McGraw Hill
2	Let Us C	Yashavant Kanetkar	16th Edition	BPB Publications
3	The C Programming Language	Brian W. Kernighan, Dennis M. Ritchie	2nd Edition	Prentice Hall

Reference Books

S.N	Title	Authors	Edition	Publisher
1	C Programming: A Modern Approach	K. N. King	2nd Edition	W. W. Norton & Company

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FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25AI104T	Digital Electronics	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended • To teach various number systems, binary codes and their applications • To facilitate students in designing a logic circuit. • To familiarize the students with the importance of error detection and error correction code.	**Students will be able to** • Understand significance of number systems, conversions, binary codes • Apply different simplification methods for minimizing Boolean functions • Students will be able to design and analyze combinational logic circuits and understand how these circuits form the **fundamental data processing units inside AI hardware systems.**

Unit I Number Systems and Codes	**[10Hrs]**
Decimal, Binary, Octal, and Hexa-decimal number systems and their conversions, ASCII code, Excess-3 code, Gray code, Complement representation of negative numbers: Signed Magnitude, One's complement method, Two's complement method, Binary Arithmetic.	
Unit II Boolean Algebra	**[10Hrs]**
Boolean Algebra & Logic gates: Axiomatic definition of Boolean Algebra .Property of Boolean Algebra, Boolean functions, Canonical & standard form, Basic Logic Gates: AND, OR, NOT, NAND, NOR, XOR, XNOR, Karnaugh Maps (K-Maps).	
Unit III Combinational Logic Design	**[10Hrs]**
Analysis of combinational circuits, Design Procedure – Binary Adder, Subtractor, BCD Adder, multiplier, comparator, decoders, encoders, multiplexers, demultiplexers, Code Converters. **"Combinational Logic Circuits and Their Applications in AI Systems"**	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Switching Theory and Logic Design	Anand Kumar	2nd	PHI
3	Digital Electronics and Design with VHDL	Volnei A. Pedroni	1st	O'Really

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Computer Organization and Design: The Hardware/Software Interface	David A. Patterson and John L. Hennessy	5th	Elsevier
2	Computer Systems Architecture.	M. Moris Mano	3rd	Pearson Education

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FIRST SEMESTER

`Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25AI105T	Fundamental of Artificial Intelligence	2		-	2	10	10	30	50

Course Objectives	Course Outcomes
This course is intended to • Gain the basics of one of the most fascinating and fastest growing areas of Computer Science • Formulate artificial intelligence problems corresponding to different applications. • Apply artificial intelligence search strategies/ algorithms to solve the problems. • Learn the applications and existing systems of Artificial Intelligence in different areas.	**Students will be able to** • Learn the fundamentals of Artificial Intelligence domain. • Comprehend the basic AI problem solving strategies. • Analyze various aspect of knowledge from AI point of view and their applications.

Unit I Introduction to Artificial Intelligence and its Problems **[10Hrs]**

Artificial Intelligence: Definition of AI, history & importance of AI, Types of AI, Turing test, Task domain of AI, AI Characteristics, State Space Search, Introduction to intelligent agents and PEAS and its respective nature **AI Problems and its Formulations**: Defining the problems as a state space search and representation Problem solving methods - Tower of Hanoi, Tic-tac-toe, Puzzle, etc,

Unit II Searching Strategies in AI **[10Hrs]**

Uninformed: Search strategies, Breadth-first search, Depth-first search, Branch and bound algorithm, Comparing uninformed search techniques. **Informed search strategies:** Indexing and Heuristic functions, Generate-and-test, Hill climbing, A* Algorithm, A0* Algorithm and best-first search. **Game Playing Algorithm:** Minmax Algorithm, Alpha Beta Pruning

Unit III Structural Knowledge Representation **[10Hrs]**

Knowledge Representation Types, Issues in Knowledge Representation, Rule-Based, Logic-Based, Frame-Based, Semantic-Based, Approaches to Knowledge Representation, Comparison between various KB, Truth Maintenance System, Case Study: MYCIN, Dendral, IBM Watson, DeepBlue DART, XCON, etc. Applications of AI in real-life

Text Books

Sr. No.	Title	Authors	Edition	Publisher
1	Artificial Intelligence	Saroj Kaushik	1st	Cengage Learning India.
2	A First Course in Artificial Intelligence	Deepak Khemani	6th	McGraw Hill Education

\Reference Books

Sr. No.	Title	Authors	Edition	Publisher
1	Artificial Intelligence	Elaine Rich, Kevin Knight, & Shivashankar B Nair	3rd	McGraw Hill
2	Artificial Intelligence: A Practical Approach	Rajiv Chopra	1st	S Chand & Co Ltd
3	Artificial Intelligence A modern approach	Stuart Russell, andPeter Norvig	2nd	Pearson

FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25AI106P	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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FIRST SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25AI107T	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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